From Middle Management to Production Relations Reshaping: How AI Agents Lead a New Round of Organizational Change

Yesong Cui[1, *], Zhenghaoyi Cui[2]
[1]Wuxi Xuandi Ni Consulting Management Co., Ltd., Wuxi 214199, China
[2]University of Technology Sydney, Sydney 2007, Australia
*Corresponding email: 947177362@qq.com

Abstract

Futurist Kevin Kelly proposed that the disruptive transformation of artificial intelligence (AI) in organizations will originate from the middle management level. Its core mechanism is AI's replacement of traditional management functions such as planning, coordination, and reporting. Building upon Kelly's framework and incorporating digital office practices, this paper explores the deeper proposition that the extensive embedding of AI agents is not merely a tool for process efficiency enhancement. It is a core driving force reshaping production relation. The paper first elucidates the essence of Kelly's middle level revolution theory and analyzes how it deconstructs traditional hierarchical structures. It then introduces AI agents as proactive actors. The study demonstrates how they will redefine power distribution, transform collaboration models, and reconstruct value creation logic. This ultimately revolutionizes the relationships between people and production resources within production relations. The study argues that AI driven organizational transformation is essentially an adaptive adjustment of production relations. This adjustment culminates in a new paradigm characterized by human machine collaboration, which is a more flexible, networked, and intelligent production relationship.

Keywords

Artificial intelligence, Organizational change, Production relations, Middle management, Human machine collaboration

Introduction

Since the Industrial Revolution, every technological leap has fundamentally reshaped social production and organizational structures. From steam powered factories to information technology driven by modern corporations, revolutions in production tools inevitably trigger transformations in production relations. We are now at the forefront of a new technological revolution powered by artificial intelligence. Unlike previous technologies that primarily replaced manual labor, AI demonstrates remarkable potential to substitute cognitive tasks and complex decision-making processes.

Against this backdrop, futurist Kevin Kelly articulated a penetrating insight. He stated that AI's transformative impact on organizations would not originate from top level strategies or foundational operations but rather emerge at the middle management tier [1]. He posits that middle management's core functions, which include planning, coordination, summarization, budgeting, and reporting, exactly represent the paradigmatic tasks where AI demonstrates its greatest proficiency. These tasks are fundamentally rule based and information driven [2]. A key consequence of AI integration will be the erosion of traditional middle-management roles, particularly those centered on intermediary functions like transmitting information and overseeing routine execution.

Kevin Kelly's perspective accurately identifies a critical entry point for organizational transformation. However, his analysis primarily focuses on organizational structure and management efficiency. Building upon this foundation, this paper explores deeper theoretical implications. When middle management functions are systematically taken over and optimized by AI agents, the significance extends far beyond cost reduction and efficiency enhancement [3]. It fundamentally challenges the core of internal production relations within organizations. Production relations refer to social relationships formed during material production processes. They encompass ownership of production resources, personnel status and interactions in production, and product distribution methods. When AI agents evolve from simple tools into autonomous agents capable of perceiving, making decisions, and executing complex tasks, they begin to participate in production relations as new quasi subjects. This redefines the allocation of authority, responsibility, and benefits. Therefore, the core argument of this paper is as follows: Based on Kevin Kelly's middle management activation theory, the deep integration of AI agents will fundamentally reshape production relations. This will drive organizations toward a new paradigm characterized by human machine symbiosis.

Theoretical foundation

To comprehend how AI reshapes production relations, one must first thoroughly grasp the theoretical essence of Kelly's perspective.

The core function of middle management and the nature of bureaucracy

Max Weber's concept of bureaucracy forms the bedrock of modern organizations. It is characterized by its hierarchical structure and clearly defined authority [4]. Within this framework, middle managers serve as indispensable glue that binds the organization together. Their primary functions can be summarized as information processing and transmission, supervision and coordination, and resource allocation and control.

The essence of these tasks lies in processing incomplete information, adhering to established rules, and making pattern-based decisions. While this approach is crucial for the effective operation of traditional bureaucratic systems, it often becomes the root cause of organizational rigidity, information distortion, and delayed decision making. Within conventional hierarchies, middle managers serve as information relay stations. They receive directives from upper management while gathering frontline feedback. Following predefined procedures, they filter, organize, and distribute this information. However, the multi layered transmission process frequently leads to distortion and delays. Moreover, while pattern-based decision making ensures procedural compliance to some extent, it also restricts flexibility and innovation. This makes it difficult to swiftly adapt to market changes and ultimately results in organizational rigidity.

The substitution effect of AI

Kelly emphasized that AI possesses inherent advantages in handling middle management functions [5]. Machine learning algorithms can learn optimal budgeting models from vast historical data. Intelligent planning systems dynamically generate and adjust complex project schedules. Natural language processing technology automatically produces weekly reports, monthly summaries, and analytical reports. Rather than merely empowering middle managers, AI directly and efficiently replaces their repetitive and routine tasks with unwavering dedication.

This paradigm shift directly results in organizational flattening and disintermediation. As information flows bypass middle management layers and coordination tasks become automated through intelligent systems, the traditional pyramid structure begins to unravel. This does not mean middle management positions will vanish entirely. Instead, their roles must fundamentally transform from being

mere information carriers and rule enforcers to becoming creative problem solvers, AI trainers, and cross functional coordinators.

From organizational change to production relations reshaping

The organizational restructuring proposed by Kelly is essentially an external manifestation of the transformation of production relations. The underlying driving force stems from AI agents as emerging proactive elements. They have intervened and reshaped the three core dimensions of production relations.

Change of ownership of means of production

In traditional manufacturing, factories, equipment, and capital were the core production factors. In the AI era, high quality domain specific data, efficient algorithm models, and powerful computing power have become the new and critical production factors [6]. AI agents themselves are the integrated embodiment and value creators of these new production factors.

At the level of production relations, this raises the question of who controls these new forms of production resources. Organizations that fail to effectively accumulate and utilize data or train dedicated AI agents will be at a competitive disadvantage. This indicates a shift in the ownership of production resources. The importance of data capital and algorithmic capital is rising sharply. Such changes may widen the digital divide and give rise to new forms of monopoly.

The change of people's status and mutual relation in production

This is the core manifestation of AI's intelligent reshaping of production relations. First, there is a shift and redistribution of decision-making authority. AI agents have assumed control over numerous procedural decisions such as approval processes and resource allocation. This partially transfers decision making power from human managers to algorithmic systems. The role of human managers has evolved from decision makers to formulators of decision frameworks and resolvers of abnormal decisions. This necessitates the establishment of new accountability mechanisms and ethical standards, namely the algorithmic accountability system [7].

Second, there is the human machine symbiosis in collaborative relationships. Future collaboration will transcend mere human to human interactions. It will evolve into hybrid teams that combine human intelligence with artificial intelligence. For instance, a product team might comprise a product manager defining requirements, an AI agent generating preliminary solutions and conducting user data analysis, engineers implementing complex logic and optimizing AI solutions, and designers enhancing aesthetics. The AI agent becomes a tireless, highly specialized quasi member of the team. This transforms production relationships from human to human to a complex network of humans, machines, human.

Third, there is a transformation of authority foundations. Traditional management authority was rooted in hierarchical positions. In AI powered organizations, authority increasingly stems from professional expertise, creativity, and proficiency in AI tools [8]. A junior employee who can skillfully guide AI agents to solve complex problems may wield greater influence than a traditional mid-level manager lacking technical expertise. This shift is driving organizational culture toward greater openness, empowerment, and innovation.

Adjustment of product distribution

When AI agents become key contributors to value creation, the distribution method must also be adjusted accordingly. First, there is the evolution of evaluation metrics. Performance assessments will shift focus from mere workload or time spent to prioritizing problem complexity resolution, innovative value creation, and enhanced human machine collaboration efficiency. Measuring AI agents' contributions and translating them into effective human employee incentives has become a

critical challenge. This requires establishing a scientific evaluation framework that comprehensively assesses AI agents' roles across production processes.

Second, there is innovation in compensation systems. Traditional compensation structures based on fixed positions and job grades may become rigid. More flexible incentive models that evaluate project contributions, skill scarcity, and human machine collaboration outcomes are gaining traction [9]. This requires compensation systems to better reflect the true sources of value creation in modern production relationships. Specifically, project contribution assessments will replace traditional position completion metrics as key determinants of compensation. Skill scarcity will be fully reflected in compensation structures. Human machine collaboration achievements will be incorporated into compensation frameworks to motivate active participation in collaborative processes.

Practice outlook and challenge

Based on the above analysis, the new production relations driven by AI agents will exhibit the following characteristics:

Networked and Flexible: The organizational structure resembles a dynamic network of "human-machine team" nodes, capable of rapid formation and disbandment based on task requirements, significantly enhancing adaptability. This networked architecture dissolves the rigid constraints of traditional hierarchy, thereby enhancing organizational adaptability to environmental changes. Simultaneously, flexibility is demonstrated through elastic workflow design, leveraging AI agents' dynamic task allocation and resource scheduling to achieve optimal human-machine coordination. For instance, during complex project execution, the system automatically identifies critical path nodes and real-time adjusts human-machine collaboration ratios, ensuring efficiency while avoiding resource idleness. Additionally, flexibility manifests through blurred organizational boundaries, where open API interfaces and external intelligent agents build ecosystem collaboration networks, further expanding the extensibility of production relations.

Empowerment and Transformation: As AI takes over routine tasks, human employees gain liberation to focus on strategic thinking, creative work, emotional communication, and complex problem-solving, thereby maximizing human values. This shift not only boosts efficiency but also reshapes workplace ecosystems. On one hand, companies leverage AI tools to free employees from repetitive labor, redirecting them to high-value areas like product innovation and customer experience optimization, creating a "human-machine synergy" collaboration model. On the other hand, employees' skill sets accelerate evolution, with cross-domain knowledge integration, critical thinking, and empathy becoming core competencies that drive organizations toward learning and innovation. However, this process comes with challenges: The disappearance of certain roles may cause short-term employment fluctuations, requiring workforce reallocation through vocational training and education system reforms. Meanwhile, issues like responsibility delineation in human-machine collaboration and data privacy protection need to be addressed through institutional innovation and ethical frameworks.

Data-Driven and Continuous Learning: The entire organization operates through data flow and the continuous learning and optimization of AI agents, forming a self-evolving positive cycle. In this cycle, data serves as the lifeblood of organizational operations, continuously nourishing AI agents to accurately identify market trends, user needs, and internal operational conditions. Leveraging powerful algorithms and learning capabilities, AI agents conduct in-depth mining and analysis of massive datasets, then propose optimization suggestions to drive continuous improvement of business processes. This self-evolving positive cycle not only enhances operational efficiency but also stimulates innovation, enabling the organization to maintain a leading

position in fierce market competition. However, to achieve this goal, organizations must establish a robust data governance system to ensure data quality, security, and compliance, while strengthening AI technology R&D and application to continuously improve agents' learning and decision-making capabilities.

However, this transformation process is accompanied by serious challenges:

(1) Technical ethics and fairness: Algorithmic discrimination, data privacy, human-machine responsibility definition and other issues need to be solved.

(2) Organizational culture and skill transformation: Companies need to foster a culture that embraces technology, encourages experimentation, and tolerates failure. Employees should keep learning and master new skills for working with AI, such as prompt engineering, AI system interpretation, and management.

(3) The impact of the social level: Structural unemployment risk, income gap widening, the change of the meaning of work and other macro social problems need to be prepared for the policy response.

Based on the above analysis, the new production relations driven by AI agents will exhibit specific characteristics. They will be networked and flexible, empowering and transformative, and data driven with continuous learning.

However, this transformation process is accompanied by serious challenges. First, there are technical ethics and fairness issues. Algorithmic discrimination, data privacy, and human machine responsibility definition need to be solved [10]. Second, there are organizational culture and skill transformation needs. Companies need to foster a culture that embraces technology, encourages experimentation, and tolerates failure. Employees should keep learning and master new skills for working with AI. Third, there is an impact at the social level. Structural unemployment risk, income gap widening, and the change of the meaning of work require prepared policy responses.

Conclusion

Kevin Kelly's assertion that "AI-driven organizational restructuring begins at the middle management level" offers a precise perspective for understanding contemporary organizational transformation. This article further demonstrates that this process is far more than mere procedural automation. At its core, AI agents as new agents of change are fundamentally reshaping production relations. They alter the composition of key production factors, redefine human roles and relationships within the production process, and necessitate corresponding new distribution mechanisms.

Ultimately, we are not witnessing the disappearance of human value, but rather its rediscovery. As AI agents take on more routine and optimization tasks, human creativity, empathy, strategic insight, and ethical judgment will become more valuable than ever. Future organizational competition will largely depend on their ability to pioneer and efficiently operate a new production model centered on "human-machine collaboration", thereby gaining a competitive edge in the wave of intelligence. In-depth exploration and research in this area hold crucial theoretical significance and practical value for organizations to formulate forward-looking strategies.

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Conflicts of Interest

The authors declare no conflict of interest.

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