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# Job Crafting and Incentive Evolution in the AI Era: A Structural Framework for the Rise of Verification Labor

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**Abstract:** Most of the current research on artificial intelligence (AI) and work transformation remains confined to the analytical paradigm of occupational determinism, relying on occupational labels to determine the intensity of AI impact. This approach struggles to effectively explain the significant variations in AI effects across different positions within the same occupation. This paper breaks away from the traditional occupational classification framework and constructs a three-dimensional work structure model based on cognitive demand, structural autonomy, and task interdependence (Cog × Aut × Int). It introduces the core concept of verification labor and employs structured comparative sampling and mixed research methods to conduct a systematic analysis based on 503 questionnaire responses and 20 in-depth interview records. The study elucidates the intrinsic mechanism by which AI drives the transformation of work patterns from execution-dominance to verification and anomaly handling-dominance. The findings reveal that the reshaping of work by AI is not unidirectionally determined by the technology itself but is jointly regulated by the configuration of the three-dimensional work structure. Positions with low cognitive demand and low autonomy exhibit significant execution substitution characteristics, those with medium cognitive demand and medium autonomy demonstrate a coexistence of technological enhancement and job substitution, and positions with high cognitive demand and high autonomy experience a simultaneous increase in performance and identity pressure. Verification labor shows differentiated distribution across various structural contexts, becoming the most representative new form of labor in the AI era. This paper updates and expands the labor process theory to a certain extent, providing a structured perspective and theoretical support for organizations to design work, reconstruct incentive mechanisms, and for individuals to achieve career adaptation.

**Keywords:** Artificial intelligence; Work reshaping; Verification labor; Three-dimensional structural model; Incentive evolution

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## 1. Introduction

The rapid proliferation of generative AI is profoundly driving structural changes in the labor sector, extending beyond the limitations of traditional physical labor automation and deeply penetrating the core aspects of knowledge-based and cognitive work. From content generation and data analysis to decision support, AI, with lower usage thresholds and faster penetration rates, integrates into various positions, driving systemic reconstruction of work content, skill sets, and value creation methods.

However, existing research still commonly adopts an occupational-risk analysis approach, treating occupation as the basic analytical unit and simply judging the possibility of AI substitution through occupational labels [1]. This research paradigm has significantly diminished explanatory power in real-world scenarios. Extensive practical experience indicates that different positions within the same occupation experience significantly different impacts from AI, while different occupations may exhibit similar patterns of change [2]. For example, basic bank tellers and administrative data entry clerks, although belonging to different occupational categories, both face AI-driven impacts on standardized execution tasks. Even within consulting positions, high-autonomy decision-making positions and low-autonomy execution positions exhibit fundamental differences in AI usage patterns, sources of pressure, and adaptive behaviors. This suggests that occupational labels are no longer effective as a basis for analyzing AI's impact on the labor sector, and traditional research paradigms face insurmountable limitations.

A systematic literature review reveals at least three significant gaps in existing research as follows:

(1) A lack of a structured analytical framework for cross-occupational comparison, making it difficult to clearly explain the core sources of AI impact heterogeneity;

(2) A superficial understanding of work content transformation, failing to capture the key new form of labor known as "verification labor";

(3) A lack of effective theoretical connections between changes in work incentive mechanisms and task reconstruction, with the applicability of classical incentive theories in AI application scenarios yet to be fully validated and addressed.

Research by Zheng Xiaoming points out that AI not only changes task execution methods but also reshapes employees' perceptions of autonomy, competence, and value judgment, necessitating structural adjustments to traditional work design and incentive systems [2].

Based on the aforementioned real-world changes and theoretical contradictions, this paper proposes a core viewpoint: in the AI era, what truly predicts and explains work transformation is not occupational labels but a three-dimensional work structure composed of cognitive demand, structural autonomy, and task interdependence; the reshaping of work by AI is essentially a dynamic process of task reallocation and verification labor expansion, with its impact effects depending on the combination pattern of the three-dimensional structure rather than the technology itself [3]. This paper uses the three-dimensional structural model as a unified analytical framework, employs a 3×3×3 configuration matrix to achieve systematic cross-position comparison, examines the moderating effect of structural heterogeneity on AI impact through mixed research methods, and ultimately constructs a complete explanatory path of "structural configuration-verification labor-incentive evolution," attempting to break through the limitations of occupational determinism and provide a more explanatory and practically valuable analytical framework for work reshaping research in the AI era.

## 2. Theoretical framework

### 2.1. From occupational analysis to task analysis: A shift in research focus

Research on AI's impact on work has undergone three core perspective iterations. Early research focused on the overall automation risk of occupations, with representative outcomes such as Frey & Osborne's occupational substitution probability list, which simplified AI's impact on work to whether a position would be completely substituted [4]. Although intuitive and easy to understand, this research approach ignored task heterogeneity within occupations and struggled to explain differentiation phenomena within the same occupation, exhibiting significant limitations. With the proposal of task-biased technological change theory, researchers gradually reached a consensus: AI is more inclined to substitute specific tasks rather than entire occupations, leading to continuous decomposition, reorganization, and reconstruction of work content [5]. The research focus thus shifted from "occupational substitution" to "task reorganization." Unfortunately, research during this phase still lacked a unified analytical framework for cross-occupational comparison, limiting the universality of research conclusions.

In recent years, the work design and incentive perspective has gradually entered scholars' research view field and received widespread attention. Research by scholars such as Zheng Xiaoming points out that AI's integration significantly alters employees' psychological perceptions and proactive adaptive behaviors, with work reshaping becoming an important path for individuals to cope with technological change and adapt to work changes. The job demands-resources model has also been applied to analyze the dual effects of AI on work, but existing research results have yet to integrate task reconstruction, new forms of labor, and changes in incentive mechanisms into a unified analytical framework, failing to form a systematic research system. Overall, research on AI and work has completed a perspective shift from occupation to task and then to work design, but it has consistently lacked clear structured analytical coordinates and core labor form concepts. This paper proposes the three-dimensional structural model and the concept of verification labor based on this research focus to fill the gaps and deficiencies in existing research [6].

### 2.2. Construction of the three-dimensional work structure model

Cognitive demand reflects the strength of requirements for analytical judgment, decision-making in uncertain situations, and comprehensive reasoning abilities in position work. In low-cognitive tasks, AI primarily serves as an execution substitute; whereas in high-cognitive task scenarios, AI mainly plays an enabling role in judgment amplification, assisting humans in conducting high-level analytical judgment and complex decision-making. Structural autonomy represents the discretionary space of practitioners in task planning, method selection, and outcome decision-making. In high-autonomy work scenarios, AI tends to function as an enabling tool, assisting individuals in conducting work flexibly; whereas in low-autonomy scenarios, AI easily evolves into a digital supervision carrier, further solidifying process norms and strengthening process constraints. This paper only objectively explains these phenomenal characteristics without delving into the underlying institutional causes. Task interdependence measures the degree of dependence of work output on cross-entity collaboration. In high-collaboration interdependence scenarios, although AI can significantly improve collaborative office efficiency, it can also easily lead to issues such as blurred responsibility boundaries and conflicts in outcome attribution; whereas in low-interdependence independent work scenarios, AI primarily improves individual work efficiency, with relatively weakened issues of responsibility attribution and attribution conflicts.

The above three dimensions are each divided into high, medium, and low levels, jointly forming 27 types of position structural configurations in a 3×3×3 matrix. This model can widely cover most occupational

positions, supporting standardized and precise comparisons across industries and work types, and can replace traditional occupational labels as a more scientific and refined unit of workplace analysis.

### 2.3. Verification labor: The core labor form in the AI era

Based on research on three-dimensional structures and task reconstruction, this paper innovatively proposes the concept of verification labor: a new form of labor that emerged after the widespread application of AI, mainly encompassing work such as content review, anomaly handling, responsibility endorsement, and risk verification. It forms a clear distinction from traditional execution-oriented labor and is a highly representative new type of labor in the intelligent era.

Verification labor encompasses three core connotations as follows:

(1) Conducting comprehensive checks on the accuracy, compliance, and suitability of AI-generated content;
(2) Handling exceptional scenarios and ambiguous issues that AI cannot effectively address;
(3) Undertaking ultimate decision-making responsibility, gradually forming a new human-machine division of labor paradigm where AI is responsible for production and humans are responsible for verification.

The rise of verification labor drives the core of work value from direct outcome production to quality verification, risk control, and responsibility underwriting, becoming a key intermediary variable connecting AI integration, work form reshaping, and incentive mechanism change.

The overall theoretical logic of this paper is clear: starting from the integration of AI technology, through the moderating effect of the three-dimensional structure, it drives the continuous expansion of verification labor, ultimately driving work pattern reshaping and incentive system evolution. Among them, organizational structural configuration determines whether AI exerts an enabling effect or a constraining effect on work, while the development and evolution of verification labor intuitively reflect the essential direction of work transformation in the context of human-machine collaboration.

## 3. Research methodology

### 3.1. Structural comparative sampling and the 3×3×3 matrix

This study abandons traditional industry- and occupation-based stratified sampling methods, instead selecting three dimensions, cognitive demand, structural autonomy, and task interdependence, as the basis for sampling. By employing structural comparative sampling, it maximizes coverage across 27 combined configurations, effectively ensuring structural heterogeneity within the sample. Ultimately, 503 valid questionnaires were collected, with respondents spanning industries such as finance, auditing, intelligent manufacturing, professional services, and the internet. The age range of participants was 22–53 years old, with 72.96% holding a bachelor's degree or higher and 82.50% being full-time employees. During the empirical analysis phase, the three core dimensions were each divided into high, medium, and low groups, forming 27 structural units through cross-classification. This approach enabled a comparative analysis of the differentiated characteristics of AI technology impacts, labor states, and job crafting behaviors across these units, facilitating subsequent hypothesis testing and mechanism validation.

### 3.2. Mixed-methods research design

For quantitative research, a Likert five-point scale was used to measure core variables such as AI integration, three-dimensional structure, verification labor, job crafting, and perceived motivation. SPSS and AMOS

software were employed for reliability and validity testing, variance analysis, and structural model empirical validation.

Qualitative research involved 20 semi-structured in-depth interviews with diverse groups, including counter staff, compliance officers, knowledge workers, and technical employees. A three-level coding method was applied to systematically extract and validate the practical forms of verification labor, analyzing the mechanisms underlying structural differences across various scenarios. This approach addressed limitations in quantitative research by providing process-oriented explanations and deeper logical support for the study's conclusions.

## 4. Research findings

### 4.1. Heterogeneous impacts under the three-dimensional structure

The results reveal significant structural differences in AI's impact on work, which can be broadly categorized into three typical patterns:

Under low cognitive demand-low autonomy configurations, AI primarily substitutes task execution, compressing repetitive work while strengthening process monitoring. Verification labor in this context is predominantly passive compliance-based auditing with low intensity, and employees exhibit limited proactive adaptive behaviors. In medium cognitive demand-medium autonomy settings, AI demonstrates dual effects: it substitutes some routine tasks while empowering individuals with analytical and collaborative capabilities. Verification labor intensity is moderate, with work content dynamically adjusting between task substitution and capability enhancement, resulting in a more balanced motivational effect. Under high cognitive demand-high autonomy configurations, AI significantly improves individual judgment and work performance but simultaneously raises industry evaluation standards, creating pressure related to professional identity and expertise recognition. Verification labor in this scenario is highly specialized, focusing on complex decision reviews and risk management. This study objectively presents these differentiated characteristics without further exploring paradoxes related to capability development.

### 4.2. Structural distribution of verification labor

Verification labor exhibits stable differentiated characteristics across the three-dimensional structure: high-cognitive jobs prioritize professional judgment and decision endorsement, while low-cognitive jobs focus on standardized process auditing. High-autonomy jobs emphasize proactive work control, whereas low-autonomy jobs rely on passive reactive execution. High-interdependence jobs involve collaborative verification and clarified responsibility attribution, while low-interdependence jobs operate through independent individual review modes. Regression analysis indicates that AI's effects on verification labor are modulated by the interaction of these three dimensions rather than being solely determined by occupational type.

### 4.3. Three logics of job restructuring

Based on differences in work structure, this study identifies three core logics driving AI-induced job restructuring as follows:

(1) Substitution Logic: Suited to low cognitive demand-low autonomy work scenarios, characterized by intelligent task substitution;

(2) Enhancement Logic: Applicable to medium cognitive demand-medium autonomy work types, featuring

coexistence of intelligent substitution and capability enhancement;

(3) Amplification-Paradox Logic: Relevant to high cognitive demand-high autonomy work forms, where improved work performance is accompanied by intensified individual psychological stress.

These three restructuring logics strictly align with work structure configurations, validating the strong theoretical explanatory power of the three-dimensional analytical model.

## 5. Discussion

### 5.1. Theoretical contributions: Extending labor process theory

This study makes three key theoretical contributions by extending labor process theory to AI contexts as follows:

(1) It replaces traditional occupational labels with a three-dimensional structural model, establishing a unified analytical framework with cross-occupational comparability;

(2) It innovatively introduces the concept of verification labor, revealing the core logic of labor process transformation from execution-oriented to verification-oriented in the AI era;

(3) It integrates technological elements, organizational structures, labor forms, and incentive mechanisms into a holistic analytical system, enhancing labor process theory's practical explanatory power in the smart era.

These findings resonate with and extend the academic lineage identified by Zheng Xiaoming *et al.*, who argue that AI empowerment triggers deep changes in employee proactive behavior and motivational logic, with job crafting playing a critical mediating and driving role.

### 5.2. Research limitations and future directions

Two limitations persist in this study as outlined:

(1) The use of cross-sectional data limits the ability to capture long-term dynamic evolutionary patterns among research subjects;

(2) The focus on differentiated manifestations of structural autonomy neglects in-depth exploration of underlying institutional roots, which will become a core focus of future research.

Subsequent studies could address these gaps through longitudinal tracking analysis, broader institutional perspectives, and expanded sample coverage.

### 5.3. Practical implications

At the organizational level, differentiated work design should be implemented based on the three-dimensional framework, incorporating verification labor into performance evaluation systems and establishing diversified incentive mechanisms that balance operational efficiency, process verification, and job responsibilities while avoiding one-size-fits-all AI implementation approaches. At the individual level, practitioners should proactively strengthen verification, anomaly handling, and risk control capabilities, adapting transformation strategies to job characteristics and evolving from single execution roles to composite roles involving verification supervision and responsibility assumption, thereby building comprehensive competitive advantages.

## 6. Conclusion

This study transcends the occupational determinism limitations in AI research by constructing a cognitive

demand-structural autonomy-task interdependence three-dimensional work structure model and innovatively proposing the concept of verification labor. It systematically reveals the internal logic of job restructuring and incentive mechanism evolution in the AI era.

Occupational labels fail to effectively predict AI's differentiated impacts; instead, the three-dimensional work structure serves as the core explanatory variable. Moreover, the rise of verification labor represents a concentrated manifestation of AI-driven deep transformation in work modes. Job form restructuring and incentive system iteration result from bidirectional coupling between work structure configurations and intelligent technology integration. These findings supplement and extend traditional labor process theory, providing a systematic theoretical basis and practical framework for organizational work optimization, incentive mechanism reconstruction, and individual career adaptation in the context of AI applications.

Looking ahead, as AI technologies continue to penetrate and transform work structures and labor forms, organizations and individuals must shift from rigid occupational-centric thinking to structured systems thinking. Through refined work design and targeted capability upgrades, they should actively adapt to technological changes, establish efficient human-machine collaboration models, and achieve sustainable long-term motivation to drive high-quality workplace development.

## Disclosure statement

The author declares no conflict of interest.

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