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System Design of Intelligent Logistics Training Base Based on Information Technology Integration:

Taking the Mingkanghui Industry-Education Integration Training Base as an Example

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ABSTRACT

Against the backdrop of intelligent logistics growth and talent shortages, this study aims to fill gaps in the integration of the internet of things, artificial intelligence, and big data with industry-education collaboration. Adopting a single-case research design, data were collected over 12 months (September 2023–August 2024) via semi-structured interviews, operational records, graduate surveys, and document analysis. Reliability was ensured through triangulation and inter-rater validation. Technology integration reduced cold-chain goods loss by 20%, increased automated sorting speed by 25%, and cut overall logistics costs by 15%. At the same time, industry-education integration boosted graduates' employment rate to 85%, with enterprise satisfaction reaching 4.2 out of 5, outperforming peer programs. Minor issues such as insufficient enterprise investment were identified and addressed. This study enriches the theoretical understanding on intelligent logistics technology-education integration and provides a replicable framework for training-based construction, alleviating industry talent shortages.

KEYWORDS

Information Technology, Intelligent Logistics, Training Base, Mingkanghui, Industry-Education Integration

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INTRODUCTION

Global economic integration is accelerating, and the logistics industry is undergoing a technology-driven transformation (Arvis et al., 2023; Ding et al., 2023). This transformation is characterized by the deep integration of the Internet of things (IoT, connected devices that collect and share data), big data, and artificial intelligence (AI), and focuses on three interrelated themes: information technology (IT) integration, system optimization, and industry-education integration (Li et al., 2024; Ye et al., 2025). Intelligent logistics is the cornerstone of modern supply chains, with operational efficiency depending on IT (Butt et al., 2024). IoT sensors enable real-time tracking of temperature, location, and cargo status, reducing cold-chain fresh produce loss rates by up to 30% compared to traditional systems (Mounika et al., 2025). Big data analytics optimizes transportation routes and inventory allocation, cutting operational costs by 15–20% (Naganawa et al., 2024). AI further enhances efficiency gains: AI-powered automated sorting lowers manual error rates from 6% to less than 2% and shortens delivery times by 18% (GhanavatiNejad et al., 2025). Additionally, scheduling models based on reinforcement learning improve resource utilization (Li & Wang, 2025).

However, existing research on IT integration suffers from technological silos, often focusing on individual technologies rather than their synergies. Attah et al. (2024) developed an IoT-based logistics monitoring system that improves supply chain transparency, but its reliance on computing resources for big data processing limits scalability and fails to meet the industry's need for multi-technology collaboration. Ji (2024) showed that big data can optimize routes by mining historical and real-time data. However, this method is highly sensitive to data quality, with poor data inputs drastically reducing algorithmic accuracy. Even innovative applications face isolation. For example, Chen et al. (2024) used blockchain and smart contracts to secure unmanned aerial vehicle deliveries. This work, however, did not explore how blockchain could integrate with IoT or AI to strengthen broader logistics ecosystems. Similarly, Li and Wang's (2025) AI-based scheduling model is efficient but has long training times, preventing quick responses to sudden logistics demands (Zhai & Song, 2024). These limitations confirm that IT alone cannot unlock the full potential of intelligent logistics. Instead, it depends on workers who can link technical tools with core logistics knowledge.

The shortage of interdisciplinary professionals capable of integrating logistics expertise with advanced IT has become a critical bottleneck in industry development (Ogedengbe et al., 2024). Traditional logistics education focuses on manual operations and basic management. It fails to cultivate talents who can debug IoT systems, analyze big data, or adjust AI algorithms. This shortfall widens the mismatch between technology and talent (Gou, 2024; Roshid et al., 2024). To address this gap, industry-education integration has become a dominant model, seen as key to connecting classroom theory with real industry needs (Wang, 2023).

However, existing industry-education initiatives still have flaws that perpetuate this mismatch. Most programs emphasize general collaboration frameworks, such as dual-tutor systems, but do not integrate cutting-edge IT into training processes. Lin et al. (2024) proposed a dual-teacher team model to enhance practical skills. However, this model struggles to engage enterprises, leaving students disconnected from IT-driven logistics workflows. Guo (2023) noted that vocational colleges rarely include specific IT tools in curricula, including AI-based route planning software and IoT-enabled cold-chain monitoring platforms, despite their standard use in the industry. Enterprise participation also remains superficial, with most firms providing internships rather than co-designing curricula or leading IT-focused practical training (Das et al., 2025; Zhuang & Zhou, 2023). As a result, students have limited exposure to real-world technical challenges, such as troubleshooting IoT sensor delays or optimizing AI-driven sorting algorithms.

In addition, technology-related education research often focuses on isolated solutions. Jackson et al.'s (2024) virtual simulation training systems improve hands-on skills but face high hardware costs and weak link simulations to real-world IT workflows, such as IoT data feedback or AI-driven decision-making. As Ahuja and Bala (2021) noted, the underdevelopment of technology-enabled