

Competency-Driven Reconstruction of the Curriculum System for Restaurant Intelligent Management in the Digital-Intelligence Era

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Abstract: Against the backdrop of the digital-intelligent transformation of the catering industry, this study adopts competency requirements as the logical starting point to explore the reconstruction of the curriculum system for the Restaurant Intelligent Management major. By systematically analyzing the new challenges facing talent cultivation, investigating evolving occupational competency structures, and identifying key competency elements through industry demand analysis, a Three-Level, Six-Dimension Competency Framework is developed for Restaurant Intelligent Management education. Based on this framework, an Integration–Dual-Subject–Three-Digitalization–Four-Innovation curriculum reconstruction model and its implementation pathways are proposed. The proposed framework aims to promote the integrated cultivation of digital-intelligent technologies and restaurant management competencies, thereby enhancing the alignment between vocational education and industry transformation. The study provides both a theoretical foundation and a practical reference for curriculum reform and talent development in Restaurant Intelligent Management programs in the digital-intelligence era.

1. Introduction

In March 2021, the Outline of the Fourteenth Five-Year Plan (2021 – 2025) for National Economic and Social Development and the Long-Range Objectives Through 2035 proposed the development of a “Digital China” strategy, emphasizing digital transformation as a key driver of changes in production modes and lifestyles. Subsequently, the Fourteenth Five-Year Plan for Digital Economy Development identified the acceleration of industrial digital transformation as one of its major strategic priorities, aiming to significantly enhance digital innovation capabilities and intelligent development levels while promoting the deep integration of digital technologies with the real economy.

Against this policy backdrop, the catering industry is undergoing a profound digital-intelligent transformation. Digitalization in the catering sector is no longer confined to front-end marketing activities; rather, it has expanded across the entire value chain, encompassing operational efficiency,

business management, financial services, and supply-chain coordination. Supported by digital and intelligent technologies, catering enterprises are increasingly pursuing comprehensive transformation from upstream procurement to downstream services and from online platforms to offline operations. Consequently, the digital-intelligence economy is deeply reshaping the catering industry and has become a critical driving force for the high-quality development of both the industry and vocational education related to catering management.

2. Challenges Facing Talent Cultivation in the Digital-Intelligence Era

2.1. The Catering Industry Has Entered a New Stage of Digital-Intelligent Transformation

China's catering industry is currently undergoing a profound transition from a traditional service-oriented sector to a digitally and intelligently driven industry. In 2024, national catering revenue reached RMB 5.57 trillion, representing a year-on-year increase of 5.3% and accounting for 11.4% of total retail sales of consumer goods, highlighting its important role in stimulating domestic consumption and employment [1].

From a policy perspective, the digital-intelligent transformation of the catering industry has become an integral part of China's national development strategy. Recent policy initiatives have encouraged the digital upgrading of catering enterprises, the intelligent development of food-delivery services, and the adoption of personalized recommendation technologies. Moreover, the Measures for the Promotion and Administration of the Catering Industry, implemented in 2025, explicitly advocate digital transformation and the enhancement of digital management capabilities within catering businesses.

From a technological perspective, digital-intelligent transformation has permeated the entire catering value chain. At the consumer end, intelligent ordering systems, personalized recommendation algorithms, and autonomous delivery technologies have been widely adopted. At the operational level, big-data technologies are increasingly used for precision marketing, inventory control, and supply-chain optimization. At the production level, intelligent kitchen equipment, Internet-of-Things (IoT)-based ingredient management systems, and digitally managed central kitchens are becoming increasingly prevalent [2]. These developments indicate that the digital-intelligent transformation of the catering industry has progressed from policy guidance and technological exploration to large-scale practical application.

2.2. Lagging Curriculum Development in Restaurant Intelligent Management Programs

Despite the rapid transformation of the catering industry, curriculum development in Restaurant Intelligent Management programs within China's vocational education system remains relatively lagging, characterized by outdated content, fragmented structures, and insufficient practical integration.

First, curriculum content has not kept pace with industry development. Although the Ministry of Education officially renamed the major from Restaurant Management to Restaurant Intelligent Management in 2022, many institutions continue to focus primarily on traditional service competencies, with limited incorporation of digital and intelligent technologies. As industry development increasingly requires employees to master new technologies, intelligent equipment, and emerging professional competencies, traditional curricula struggle to meet evolving occupational demands [3].

Second, curriculum structures often lack systematic integration and progressive competency development. Existing course modules are frequently disconnected and fail to establish a coherent learning pathway covering digital tool application, data analytics, business intelligence, and

scenario-based operations.

Third, practical teaching remains insufficiently aligned with digital-intelligent industry scenarios. Many institutions still face challenges such as outdated training equipment, limited access to authentic digital business environments, and inadequate enterprise participation. Consequently, students often have limited opportunities to develop competencies relevant to contemporary industry practices.

2.3. Curriculum Reconstruction as an Inevitable Choice

Given the growing gap between industry requirements and existing educational provision, reconstructing the curriculum system of Restaurant Intelligent Management has become an inevitable requirement for high-quality vocational education development.

On the one hand, national policies promoting educational digitalization provide strong institutional support for curriculum reform. On the other hand, the digital-intelligent transformation of the catering industry has generated demand for a new generation of professionals equipped with competencies in digital operations, data analytics, intelligent equipment management, and new-media marketing. Industry reports indicate that catering enterprises increasingly require application-oriented talents capable of supporting digital transformation and business innovation, while current education systems remain insufficiently responsive to these emerging needs [4].

Therefore, a systematic reconstruction of curriculum objectives, course structures, teaching content, and implementation mechanisms is essential for cultivating talents capable of adapting to the digital-intelligent development of the catering industry.

3. Emerging Competency Requirements for Restaurant Intelligent Management

3.1. Evolution of Occupational Competency Structures

The digital-intelligent transformation of the catering industry is fundamentally reshaping occupational competency requirements. Talent demand is evolving from single-skill orientation toward comprehensive competency development, from experience-based decision-making toward data-driven management, and from operational execution toward innovation-oriented leadership.

Four major competency trends can be identified. First, digital operation literacy has become a fundamental requirement for catering professionals. The demand for employees capable of operating digital platforms and intelligent management systems has increased significantly, with growth rates far exceeding those of traditional service positions [5].

Second, data analytics and business intelligence capabilities have emerged as critical sources of competitive advantage. Employees are increasingly expected to extract valuable insights from operational data, identify business patterns, and support managerial decision-making.

Third, intelligent equipment operation and maintenance capabilities have become important technical competencies. The widespread adoption of intelligent cooking robots, autonomous delivery vehicles, and smart warehousing systems requires employees to possess basic operation, troubleshooting, and maintenance skills.

Finally, cross-disciplinary integration and innovation capabilities have become essential for long-term career development. As competition shifts from product-based competition toward customer experience, service innovation, and business-model innovation, catering professionals must develop stronger interdisciplinary thinking and innovation capabilities.

3.2. Analysis of Industry Competency Requirements

To systematically identify competency requirements in the digital-intelligence era, this study employed literature review, enterprise investigation, DACUM occupational analysis, and expert interviews. The results indicate that contemporary catering professionals require competencies in procurement and supplier management, production and quality management, online and offline marketing, service planning, aesthetic design, digital literacy, information technology application, intelligent operations, and big-data analytics. These competencies constitute the foundation for curriculum reconstruction and talent cultivation in Restaurant Intelligent Management programs.

3.3. Construction of a Three-Level, Six-Dimension Competency Framework

Based on the analysis of occupational competency evolution and industry demand, a Three-Level, Six-Dimension competency framework was developed for Restaurant Intelligent Management education (Table 1).

The framework consists of three progressive competency levels: Foundational Competencies, Core Competencies, and Advanced Competencies. Drawing upon competency theory and DACUM analysis, six competency dimensions were identified: Digital Technology, Data Analytics, Intelligent Operations, Customer Experience, Supply-Chain Collaboration, and Innovation & Entrepreneurship. Together, these dimensions encompass the key competency requirements of contemporary catering occupations and reflect the vocational education principle of cultivating broad foundations, solid professional knowledge, and strong practical capabilities.

Table 1: Three-Level, Six-Dimension Competency Framework for Restaurant Intelligent Management.

Competency Dimension	Foundational Competency	Core Competency	Advanced Competency
Digital Technology	Digital tool operation; office software; information retrieval	Smart store management; membership operation; digital marketing; new-media promotion	Digital transformation strategy; AI/IoT adoption; system architecture and integration
Data Analytics	Business data collection; basic statistics; report interpretation	Business analysis; data visualization; customer profiling; precision marketing	Predictive analytics; machine learning; trend forecasting; data governance
Intelligent Operations	Smart kitchen operation; digital SOP execution; anomaly reporting	Equipment optimization; energy management; smart inventory; food traceability	Multi-store intelligent operations; smart central kitchen; carbon management
Customer Experience	Digital customer service; feedback collection; service improvement	Customer journey design; personalized services; satisfaction enhancement	Brand strategy; omnichannel experience ecosystem; service innovation
Supply-Chain Collaboration	Procurement systems; inventory control; supplier information maintenance	Supplier evaluation; demand forecasting; logistics optimization	Digital supply-chain strategy; industrial internet; sustainable supply chains
Innovation & Entrepreneurship	Innovation awareness; entrepreneurship fundamentals	Innovation project management; business model design; team leadership	Business model innovation; global expansion; ecosystem development

4. Curriculum Reconstruction Framework for Restaurant Intelligent Management

4.1. Development of a Progressive Curriculum System

Based on the proposed Three-Level, Six-Dimension Competency Framework, this study develops an Integration–Dual-Subject–Three-Digitalization–Four-Innovation (IDTF) Curriculum Framework for the Restaurant Intelligent Management major.

Integration refers to the systematic incorporation of information technology, digital technology, intelligent technology, and restaurant management knowledge into a unified curriculum system, enabling the integrated development of professional knowledge, practical skills, and digital competencies.

Dual-Subject Collaboration emphasizes deep cooperation between educational institutions and catering enterprises. By leveraging the complementary strengths of both parties, curriculum design, implementation, and evaluation are jointly conducted to ensure alignment with industry needs.

Three-Digitalization refers to the comprehensive digitalization, informatization, and intelligentization of curriculum systems, teaching content, and instructional processes. Guided by industry competency requirements, digital technologies are embedded throughout the entire teaching and learning process.

Four-Innovation includes the establishment of new training objectives, the development of a new curriculum structure, the adoption of innovative teaching models, and the construction of new educational resources. Together, these four dimensions support the cultivation of high-quality professionals capable of adapting to the digital transformation of the catering industry.

The proposed curriculum framework provides a systematic approach to integrating digital-intelligent competencies into professional education and facilitates the cultivation of application-oriented talents for the emerging digital catering economy.

4.2. Reconstruction of Digital-Intelligent Teaching Content

The reconstruction of teaching content is a central component of curriculum reform. Traditional restaurant management curricula are largely experience-oriented and therefore insufficient to meet the demands of digital-intelligent industry development. Consequently, curriculum content should undergo three major transformations: from experience-based instruction to data-driven learning, from single-skill training to comprehensive competency development, and from closed classroom teaching to open and industry-connected learning environments.

For example, marketing-related courses can be reorganized into four project-based modules: restaurant market intelligence, dine-in product marketing, digital food-delivery marketing, and thematic event planning. All modules should be delivered through authentic enterprise cases to enhance students' practical problem-solving capabilities.

Similarly, service-related courses can incorporate digital-intelligent teaching projects such as VR-based simulation training, virtual banquet design, and customer information management. These learning activities should be closely connected with smart dining scenarios to improve students' understanding of contemporary service operations and customer experience management.

4.3. Innovation in Teaching Organization

Innovative teaching organization is essential for the effective implementation of the reconstructed curriculum. Restaurant Intelligent Management education in the digital-intelligence era should move beyond traditional teacher-centered, classroom-centered, and textbook-centered approaches and adopt a student-centered, competency-based, and technology-enhanced instructional

model.

First, project-based learning should continue to serve as a core pedagogical strategy. Real workplace tasks can be used as learning carriers, allowing students and instructors to collaboratively complete project analysis, design, and implementation while cultivating digital-intelligent competencies through authentic problem-solving processes.

Second, blended online – offline teaching should be widely adopted. Before class, learning tasks and micro-learning resources can be distributed through digital learning platforms. During class, artificial intelligence tools, digital teaching software, and case-based discussions can support competency development. After class, virtual simulation systems can provide extended learning opportunities and practical training.

Third, a dual-subject cultivation model should be explored. Educational institutions and partner enterprises jointly participate in teaching implementation, integrating classroom instruction with enterprise internships and workplace training. Such collaboration enables real-time interaction between educational processes and industrial practices, thereby enhancing the relevance and effectiveness of talent cultivation.

5. Implementation Pathways for Curriculum Reform

5.1. School – Enterprise Collaborative Development of Curriculum Resources

Curriculum resources serve as the foundation for curriculum implementation. To bridge the gap between educational content and industrial demand, this study proposes a Three-Dimensional Collaboration Mechanism for curriculum resource development.

The first dimension is demand collaboration, in which joint teams composed of academic faculty and industry experts identify typical work tasks and emerging competency requirements in the context of digital-intelligent transformation.

The second dimension is development collaboration, which focuses on creating modular curricula and project-based learning resources derived from authentic enterprise cases.

The third dimension is updating collaboration, which establishes a dynamic resource renewal mechanism. Curriculum content should be reviewed and updated annually to ensure consistency with ongoing technological innovation and industrial transformation.

5.2. Development of Digital-Intelligent Practice Platforms

Practical teaching platforms play a crucial role in cultivating professional competencies. Schools and enterprises should jointly establish digital-intelligent training centers that closely replicate real operational environments.

These centers should incorporate intelligent ordering systems, inventory management platforms, customer analytics systems, and other production-oriented technologies currently used by catering enterprises. Such facilities allow students to experience authentic digital working environments without leaving campus.

Furthermore, off-campus practice bases should be expanded by encouraging enterprises to provide access to smart restaurants, intelligent central kitchens, and other real-world operational scenarios. This approach effectively connects classroom learning with workplace practice and promotes deeper integration between education and production.

5.3. Development of Digital-Intelligent Dual-Qualified Faculty

Teachers are the primary agents of curriculum implementation, and their digital competencies

directly influence educational quality. To strengthen faculty development, this study proposes a Digital-Intelligent Dual-Qualified Faculty Development Model characterized by standards, platforms, and institutional support.

First, competency standards should be established to define digital literacy requirements across six dimensions, including instructional design, resource development, teaching implementation, assessment, collaborative education, and professional development.

Second, practical development platforms should be jointly established by schools and enterprises. Faculty members should participate in enterprise practice for no less than six months every five years to enhance their understanding of emerging technologies and industrial practices.

Third, institutional support mechanisms should be developed through dual-appointment arrangements. Industry experts can serve as enterprise mentors within educational institutions, while academic faculty can participate in enterprise projects as technical consultants. This bidirectional exchange mechanism promotes mutual learning and competency integration between academia and industry.

6. Conclusions and Future Prospects

Against the backdrop of the digital-intelligent transformation of the catering industry, this study proposes a competency-driven curriculum reconstruction framework for the Restaurant Intelligent Management major. Through the analysis of evolving occupational competencies, a Three-Level, Six-Dimension Competency Framework is established, and an Integration – Dual-Subject – Three-Digitalization – Four-Innovation curriculum model is developed. In addition, practical implementation pathways are proposed to facilitate the integrated cultivation of digital-intelligent technologies and restaurant management competencies.

Future curriculum reform should continue to evolve alongside technological innovation. Particular attention should be given to the educational applications and ethical implications of large-scale artificial intelligence models, including AI-assisted instructional design and personalized learning pathways. Furthermore, future research should explore lifelong learning mechanisms for digital-intelligent catering professionals to support sustainable competency development throughout their careers.

Through continuous industry–education integration and curriculum innovation, Restaurant Intelligent Management programs can better cultivate high-quality professionals capable of supporting the sustainable and high-quality development of the digital-intelligent catering industry.

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