

Research on the Cultivation of AI-Based Composite Economic Management Talents in the Silk Industry under the Regional Economic Development of Guangxi

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ABSTRACT In the digital economy era, Guangxi's silk industry is undergoing intelligent transformation, creating an urgent need for interdisciplinary talents proficient in both AI technology and economic management. This study analyzes the significance, challenges, and strategies of cultivating AI-based composite economic management talents, highlighting gaps in traditional education, industry alignment, and school-enterprise collaboration. To address these challenges, the study proposes constructing a dual-core curriculum integrating AI and economic management, developing a practice platform that simulates the full silk industrial chain, and establishing a government-school-enterprise collaborative education mechanism. These strategies aim to equip students with both technical literacy for AI applications and high-level management capabilities to support intelligent production, smart supply chains, and precision marketing. The framework can be integrated with intelligent data analysis platforms, wireless monitoring systems, and edge computing infrastructures to provide real-time feedback, practical training, and adaptive decision-making, offering an engineering-oriented approach to cultivating high-quality talents for the sustainable and technology-driven development of Guangxi's silk industry.

INDEX TERMS AI-skilled professionals, silk industry, economic management, intelligent education systems

I. INTRODUCTION

GUANGXI is a major silk-producing province in China, with a long history of sericulture and abundant resources. With the rapid development of new-generation information technologies, the traditional silk industry is undergoing a profound intelligent transformation. Under the new development pattern, Guangxi's regional economic transformation and upgrading have placed higher demands on the silk industry, which urgently requires compound talents who understand both economic management and AI technology applications. However, the existing training system cannot meet the needs of the industry's intelligent development, and traditional economic management education is severely disconnected from cutting-edge technology applications. Within the framework of the regional economic development strategy, how to create a scientific and effective training model for AI-skilled compound economic management talents has become a key issue in promoting the high-quality development of Guangxi's silk industry. This paper takes Guangxi as the research subject and conducts

a comprehensive analysis of the significance, problems, and strategies of talent cultivation, thereby providing talent support for the intelligent transformation of the silk industry.

II. THE SIGNIFICANCE OF CULTIVATING AI-BASED COMPOUND ECONOMIC MANAGEMENT TALENTS IN GUANGXI'S SILK INDUSTRY

A. ADAPTING TO THE NEEDS OF GUANGXI'S REGIONAL ECONOMIC TRANSFORMATION AND UPGRADING

Guangxi is in an important period of economic restructuring and industrial transformation and upgrading. The development of traditional industries towards digitalization and intelligence has become an inevitable trend in regional economic development. The silk industry is a traditional advantageous industry in Guangxi. The transformation and upgrading of the silk industry is directly related to the quality of regional economic development. Cultivating AI-based composite economic management talents—defined as interdisciplinary professionals who integrate advanced

computational logic with strategic business oversight—can inject new management concepts and technology application capabilities into the industry. This profile prioritizes a “Management-Led, Tech-Enabled” weight distribution. This 70:30 ratio is strategically calculated to address the identified 70% gap in high-end intelligent management systems in the region; it ensures that 70% of the focus remains on high-level economic decision-making to drive industry strategy, while 30% is dedicated to the mastery of AI tool implementation and data interpretation to bridge the current technical literacy gap [1]. Such talents can use modern management tools such as data analysis and intelligent decision-making to improve resource allocation, improve operational efficiency, innovate marketing strategies, and improve the overall competitiveness of the industry. The cultivation of compound talents can break through the bottleneck of traditional industrial development, promote the integration of the silk industry with other emerging industries—an integration strategy equally vital for the modernization of the broader textile industry, and give continuous impetus to the transformation and upgrading of Guangxi’s regional economy, and help create a modern industrial system with local characteristics [2].

B. PROMOTING THE INTELLIGENT DEVELOPMENT OF THE SILK INDUSTRY

Current data indicates that while Guangxi’s silk industry has achieved a high degree of mechanization, the penetration of “intelligent manufacturing” (AI-driven) remains below 15% across small and medium-sized enterprises. Although the region accounts for a significant portion of China’s raw silk output, the digitalization of the supply chain is currently concentrated in the primary processing stage, leaving a 70% gap in high-end intelligent management systems. The intelligent development of the silk industry requires the deep application of AI technology to the entire industrial chain, including production, management, and marketing. AI-based composite economic management talents possess both technical understanding and management execution capabilities, enabling them to promote innovations such as intelligent manufacturing, smart supply chains, and precision marketing. In the production process, these talents can use machine learning algorithms to optimize operational workflows. While data-driven models can predict market demand to support flexible production, such strategies must be integrated with the silk industry’s unique agricultural constraints. Specifically, the seasonal fluctuation of raw material (cocoon) supply often exerts a more decisive impact on production schedules than consumer demand signals alone [3]. In the management process, they can build intelligent decision-making systems to improve the operational efficiency of enterprises; in the marketing process, they can use big data to analyze consumer behavior and conduct precision marketing. Composite talents possess both an in-depth understanding of technical principles and robust practical application capabilities, functioning as a critical

communicative bridge between technical and management departments to ensure the systematic implementation of intelligent projects. This is of great significance for promoting the transformation of Guangxi’s silk industry from a labor-intensive industry to a technology-intensive industry [4].

C. ENHANCE INDUSTRIAL COMPETITIVENESS AND TALENT QUALITY

Against the backdrop of increasingly fierce global competition, the core of industrial competitiveness is the quality of talent. Cultivating AI-based composite economic management talents is conducive to promoting the innovative development of Guangxi’s silk industry and enhancing its competitiveness in the market. Talents with interdisciplinary knowledge structures and comprehensive application capabilities can think about relevant issues of industrial development from a strategic perspective and propose innovative solutions [5]. Systematically cultivating a talent pool that understands the laws of traditional industries while mastering modern technological means will provide intellectual support for industrial development. At the same time, the process of talent cultivation is a process of knowledge innovation and transformation of scientific and technological achievements, which is conducive to industry-university-research cooperation and accelerates the transformation of scientific research results into productivity. The gathering of talents can generate a talent siphon effect, attracting more outstanding talents and innovative resources to the Guangxi silk industry. Talents and industries promote each other, ultimately achieving a comprehensive improvement in the core competitiveness of the industry [6].

III. PROBLEMS IN CULTIVATING AI-STYLE COMPOSITE ECONOMIC MANAGEMENT TALENTS IN GUANGXI’S SILK INDUSTRY

A. INSUFFICIENT INTEGRATION OF TRADITIONAL ECONOMICS AND MANAGEMENT EDUCATION WITH AI TECHNOLOGY

At present, the curriculum of economics and management majors in colleges and universities is still mainly based on traditional theoretical teaching, with a small proportion of content on emerging technologies such as AI, big data, and cloud computing. The curriculum system cannot keep up with the pace of technological development. Many colleges and universities do not have systematic AI technology courses in economics and management majors. Even if relevant courses are offered, they are mostly limited to conceptual introduction and lack the cultivation of practical application ability. There is a lack of compound teachers who are proficient in both economics and management and AI technology, which prevents effective guidance for students in combining combine technology with management practice [7]. The teaching method is still mainly based on theoretical explanation, and lacks case teaching and project training based on real industrial scenarios. Students find it difficult to appreciate the practical application value of arti-

ficial intelligence in economics and management. There are obvious professional barriers. Economics and management lack effective interdisciplinary cooperation with computer science, data science and other majors, and students cannot receive systematic interdisciplinary knowledge training. This lack of integration leads to students who can only manage or only code. To rectify this, the talent profile must be restructured: the core competency is not 'algorithm development' (technical) but rather 'algorithmic application' (management). The skill weight should shift from pure coding toward data-driven strategic analysis. To maintain the primary role of economic oversight, the curriculum structure is benchmarked at a 30% technical weight, which is sufficient for overseeing AI-integrated workflows without diluting the core management expertise required for the silk industry's complex industrial chain [8]. The training of artificial intelligence talents in the silk industry in Guangxi is shown in Table 1:

B. THE DISCONNECT BETWEEN THE CHARACTERISTICS OF THE SILK INDUSTRY AND TALENT CULTIVATION

Empirical observations of the regional market show that while over 80% of silk enterprises in Guangxi express an urgent need for digital upgrading, only 5% of their current management staff possess the technical literacy to operate AI-based decision systems. There is a clear disconnect between the talent cultivation of colleges and universities and the actual needs of Guangxi's silk industry. This empirical gap highlights that the bottleneck is no longer equipment acquisition, but the human capital capable of managing it. The course content does not pay attention to the special characteristics of the silk industry. Students lack in-depth understanding of the industrial chain structure and production processes. Crucially, they often overlook the fundamental agricultural nature of the silk industry, where seasonal cocoon harvests create supply-side volatility that complicates AI-driven demand forecasting. Without understanding how to balance raw material availability with market trends, students cannot effectively implement smart manufacturing [9]. The teaching resources construction lacks special textbooks, case studies and training projects designed for the silk industry, and students have very little practical experience in the industry. Although school-enterprise cooperation exists, it is mostly a formal cooperation. The depth and breadth of enterprise participation in talent cultivation are insufficient. Students' internships and training are just superficial and they cannot obtain real practical experience in the industry. At the same time, the talent cultivation evaluation system emphasizes theoretical assessment and neglects the cultivation of practical application ability and innovation ability, resulting in graduates having to undergo a long period of secondary training after entering the enterprise before they can be competent in their work [10].

C. THE SCHOOL-ENTERPRISE COLLABORATIVE EDUCATION MECHANISM IS NOT PERFECT

Although school-enterprise cooperation has become the main way of talent cultivation, there are still many problems in practice. First, the level of cooperation is low, mainly focusing on shallow cooperation such as student internships and job recommendations, while lacking deep-level cooperation, including joint construction of majors, joint course development, joint teachers training, and joint research. Secondly, the interest linkage mechanism is not sound. Schools and enterprises have not established a stable long-term cooperative relationship, and enterprises are not very enthusiastic about participating in talent cultivation. It is difficult for universities to obtain practical resources from the front line of industry. Third, there is a lack of organizational guarantee mechanism for collaborative education. There is no overall management agency or division of labor and cooperation system [11]. In addition, the government's guiding role in school-enterprise cooperation has not been fully utilized. There is a lack of systematic policy support and resource investment, and a three-party collaborative education situation of government guidance, school leadership, and enterprise participation has not been formed. Due to the lack of an evaluation mechanism, the quality of school-enterprise cooperation cannot be guaranteed, the effectiveness of cooperation cannot be measured, and the collaborative education model cannot be continuously improved and developed in depth [12]. The comparison of the current situation of the integration of traditional economic management education and artificial intelligence technology is shown in Table 2:

IV. CULTIVATING AI-BASED COMPOSITE ECONOMIC MANAGEMENT TALENTS IN GUANGXI'S SILK INDUSTRY

The practice platform is designed with a progressive operation process tailored to the vertical industrial chain of the silk industry (see Figure 1). Unlike generic templates, this process integrates sericulture resource management and textile manufacturing logic into every stage of student development.

A. CONSTRUCTING A CURRICULUM SYSTEM THAT INTEGRATES AI WITH ECONOMICS AND MANAGEMENT

The reform of the curriculum system should be demand-oriented and problem-oriented, and organically integrate AI technology and economic management knowledge. The core professional courses should be optimized. The curriculum will move beyond simply "adding" AI courses to a traditional base. Instead, it will implement an "AI-Embedded Management" model. While retaining fundamental theories, traditional modules like accounting and marketing will be restructured into Intelligent Accounting & Robotic Process Automation (RPA) and AI-Driven Consumer Analytics. This ensures that technical courses like machine learning and intelligent decision-making are not isolated electives but are the functional engines of the core management discipline.

TABLE 1. Summary of Problems in Cultivating AI-Style Talents in Guangxi's Silk Industry

Problem Categories	Main manifestations	Specific issues	Impact and consequences
Insufficient integration of traditional education and AI technology	Outdated curriculum	AI, big data, and cloud computing constitutes a small proportion. The course updates are not keeping pace with technological advancements.	Students lack sufficient technical knowledge and are unable to adapt to the demands of intelligent transformation.
	Weak teaching staff	There is a lack of teachers who are proficient in both economics and management as well as AI technology.	Unable to effectively guide students in combining technology with management practice.
	Single teaching method	It mainly focuses on theoretical explanations and lacks case studies and project training based on real industry scenarios.	Students struggle to understand the practical value of AI in economic management.
	Insufficient interdisciplinary collaboration	There is a lack of effective collaboration between economics and management and majors such as computer science and data science.	The students trained are either "all management skills but no technical skills" or "all technical skills but no business skills."
The disconnect between industry characteristics and talent cultivation	Course content detached from industry	Industry-specific characteristics were not taken into account. Students lack awareness of the industry's agricultural dependency, particularly the seasonal fluctuations in cocoon supply that can override straightforward AI-based demand predictions.	The knowledge learned cannot be effectively applied to the practice of the silk industry.
	vague training objectives	Ignoring the reality that <15% of regional firms use AI for predictive marketing; The talent needs for the intelligent transformation of Guangxi's silk industry were not considered.	Misalignment between training focus and industry needs.
	Lack of teaching resources	There is a lack of specialized teaching materials, case studies, and practical training projects for the silk industry.	Students have few opportunities to engage with actual industry practices.
	The evaluation system is unreasonable	Emphasis on theoretical assessment, neglect of practical application skills and innovation.	Graduates need a considerable amount of further training before they can be competent in their jobs.

TABLE 2. Comparison of the Current Status of Integration between Traditional Economics and Management Education and AI Technology

Comparison Dimensions	Current situation (traditional model)	Demand (AI Integration Model)
Course Content	- Primarily based on traditional economic and management theories - AI technology content accounts for less than 10%, a figure largely derived from introductory elective courses rather than integrated core curricula - Remains at the level of conceptual introduction	- The system's AI, Big Data, and Cloud Computing courses - Technical content accounts for a targeted 30% (optimized to provide sufficient "algorithmic application" literacy for managers without requiring full developer-level coding proficiency) - Emphasis is placed on cultivating practical application skills
Faculty Structure	- Primarily composed of teachers with a single subject background; - Lack of practical experience in AI technology; - Less than 5% of teachers possess multidisciplinary expertise.	- Interdisciplinary faculty - Experienced in industrial AI applications - Over 30% of faculty members possess multidisciplinary backgrounds
Teaching methods	- Primarily lecture-based; - Case studies mainly consist of written descriptions; - Practical components account for less than 20%.	- Project-based and scenario-based teaching - Case studies based on real industry data - Practical components account for more than 50%
Practice Platform	- Traditional management labs - Primarily use simulation software - Lack of AI application scenarios	- AI + Business Management Intelligent Experimental Platform - Real-world Industry Data Analysis Environment - Intelligent Scenario Training in the Silk Industry
Industry docking	- General company visits and internships - Short-term on-the-job training - Limited connection with the silk industry	- In-depth university-enterprise collaborative training - Long-term project cooperation - Deep involvement in all aspects of the silk industry chain

In this model, the "Technical Core" is set at a 30% weight, focusing on data literacy and AI tool usage. This specific proportion is derived from the "algorithmic application" requirement, ensuring students can direct AI resources effectively while maintaining a 70% "Management Core". This ensures that AI is treated as a strategic asset rather than a standalone IT skill, directly serving the 80% of regional enterprises needing digital upgrading. Secondly, develop integrated courses with industry characteristics, such as intelligent manufacturing management, digital supply chain management, and big data analysis of the silk industry. These courses should emphasize the "Silk-AI Integration" by teaching students how to build resilient supply chain models that account for the seasonal cyclicity of raw materials, ensuring that intelligent manufacturing logic aligns with the biological realities of sericulture [13]. Secondly, strengthen the practical teaching link, build teaching facilities such as virtual simulation laboratory and intelligent decision-making training platform, and build a teaching resource system based on case library and project library based on real industry data so that students can learn and apply what they have learned in practice. At the same time, establish a modular and flexible curriculum system, allowing students to freely choose course modules according to their career development direction to meet the needs of personalized learning. In addition, strengthen the construction of teaching staff, combine introduction and training, and cultivate a dual-qualified teacher team that understands both

theory and practice, and both management and technology through enterprise secondment, so as to ensure the quality of course teaching. A continuous improvement mechanism for the curriculum has been established, and the curriculum content is updated regularly in accordance with technological development and industry needs to ensure that the curriculum system is advanced and meets the needs [14].

B. BUILDING A SILK INDUSTRY PRACTICE PLATFORM THAT INTEGRATES INDUSTRY AND EDUCATION

The construction of practical platforms should emphasize deep industry involvement and application in real-world scenarios. First, establish on-campus training bases, equipped with silk-specific ERP systems, raw silk quality data analysis platforms, and Silk Road cross-border e-commerce simulation systems. These facilities allow students to simulate the management of biological assets (cocoons) alongside textile production data, creating a simulated industrial environment that reflects the true complexity of the silk sector. Second, co-build off-campus practice bases with leading enterprises. Focus should be placed on projects that bridge the gap between traditional weaving and AI, such as "AI-based defect detection in silk fabrics" or "Big data forecasting for international raw silk trade". This ensures students participate in actual enterprise projects that carry distinct industry depth. Third, establish a collaborative innovation platform that integrates industry, academia, and research, organizes university faculty, students, and enterprise R&D personnel

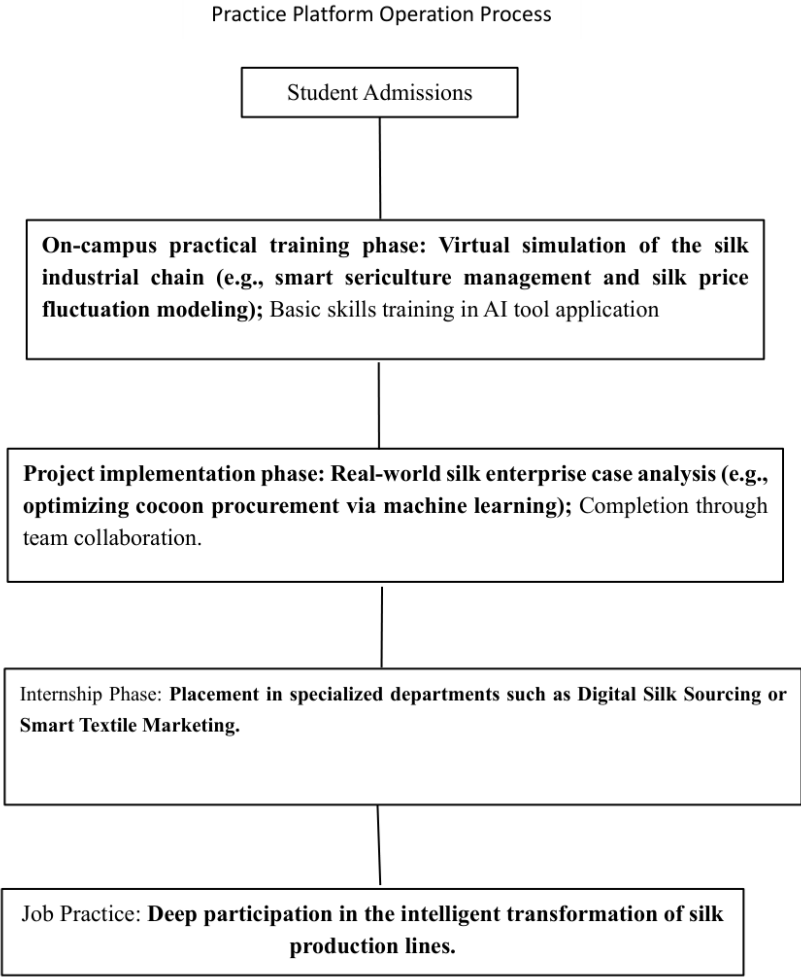


FIGURE 1. Industry-Specific Flowchart of the Silk Industry Practice Platform (Integrating Sericulture Data & Textile Management)

to conduct applied research and address key issues in the intelligent transformation of the silk industry, transforms research results into teaching resources, and promotes positive interaction between teaching, research, and production. Fourth, establish a flexible model for practical teaching, adopting project-based and studio-based approaches, allowing students to complete comprehensive project tasks in groups, cultivating their teamwork and comprehensive application abilities. Finally, introduce an enterprise mentor system, appointing senior executives and technical experts from enterprises as off-campus mentors, to jointly guide students' practical learning together with on-campus teachers, thereby achieving an organic connection between theory and practice. A practical achievement evaluation system should be established, incorporating the completion level of practical projects, innovative demonstrations, and enterprise evaluation feedback into the overall evaluation of students, thereby encouraging active participate in practical learning [15]. Based on the above analysis, the traditional talent training model has obvious shortcomings in terms of curriculum design, teaching methods, and school-enterprise cooperation (see Figure 2). These problems highlight the necessity and

urgency of transforming to an AI compound training model.

C. ESTABLISH A TALENT CULTIVATION MECHANISM THAT INTEGRATES GOVERNMENT, UNIVERSITIES, AND ENTERPRISES

The construction of a collaborative talent cultivation mechanism requires the joint efforts of the government, universities, and enterprises. At the government level, specific policies should be introduced to support the cultivation of AI-skilled professionals in the silk industry, with dedicated funds allocated for platform construction, curriculum development, and teacher training. Enterprises participating in talent cultivation should receive tax breaks and project support as incentives. A mechanism for forecasting and publishing industry talent demand should be established, with regular surveys and analyses of industry talent needs to provide decision-making support for university talent cultivation. Universities should establish dedicated collaborative talent cultivation management institutions to coordinate university-enterprise cooperation and establish sound systems and operational mechanisms for such cooperation. Talent cultivation models should be reformed, promoting new models

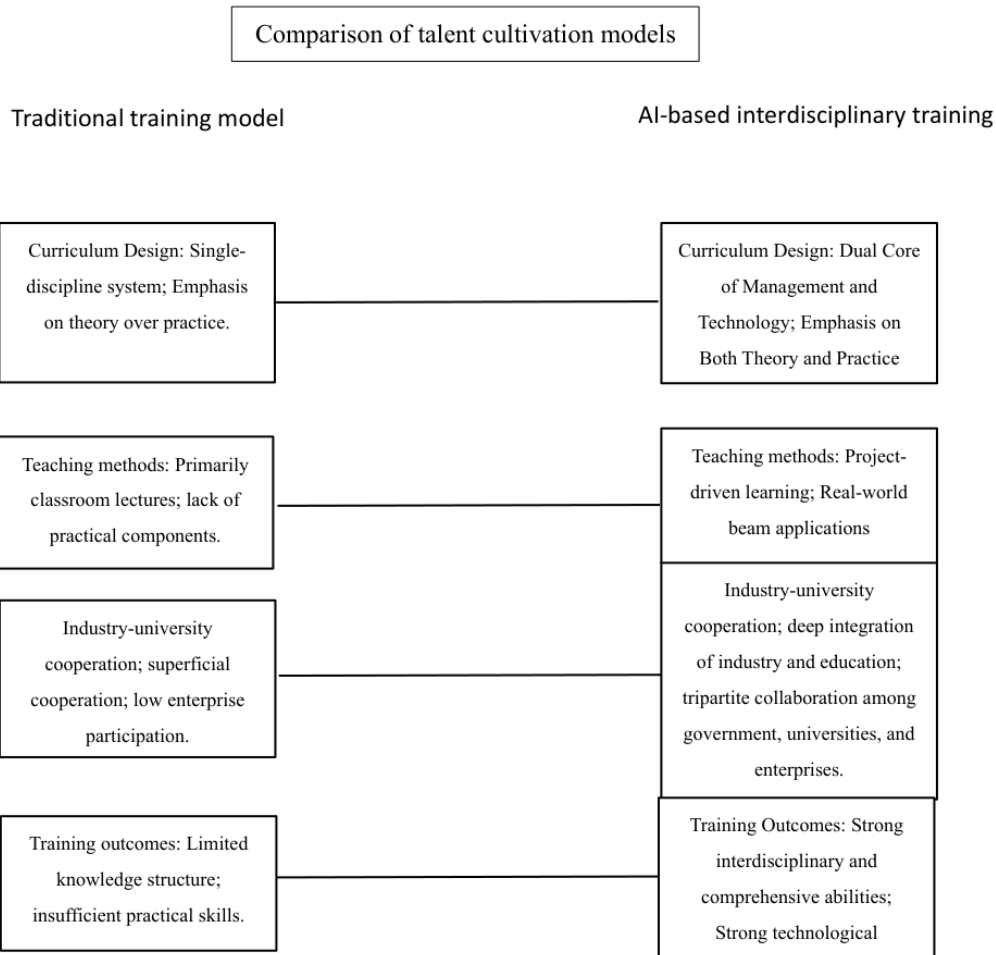


FIGURE 2. Comparison between traditional talent training models and AI-based interdisciplinary talent training models

such as order-based training and modern apprenticeships to deeply involve enterprises in the entire talent cultivation process. A sound teacher evaluation system should be established, incorporating enterprise practical experience, horizontal research projects, and technical service achievements into the teacher assessment system to encourage teachers to align with industry needs. Enterprises should participate in professional and curriculum development, providing real projects and production data, internship and training positions, and sending technical experts to guide teaching. A joint talent cultivation fund should be established to support student innovation and entrepreneurship projects and research activities. At the same time, a regular communication mechanism among the three parties will be established to promptly resolve issues arising in the collaborative education process through joint meetings, thematic seminars, and other means, and to continuously optimize the cooperation model. The competency structure of AI-skilled professionals exhibits multi-layered characteristics built on a 7:3 ratio of management to technical expertise. The primary layer is Management Execution (Decision Analysis and Strategy), supported by a Secondary Layer of Technical

Proficiency (AI Application and Data Logic). The goal is not to train AI developers, but to train Economic Managers capable of directing AI resources. The relationship between the competency structure of artificial intelligence talents is shown in Figure 3:

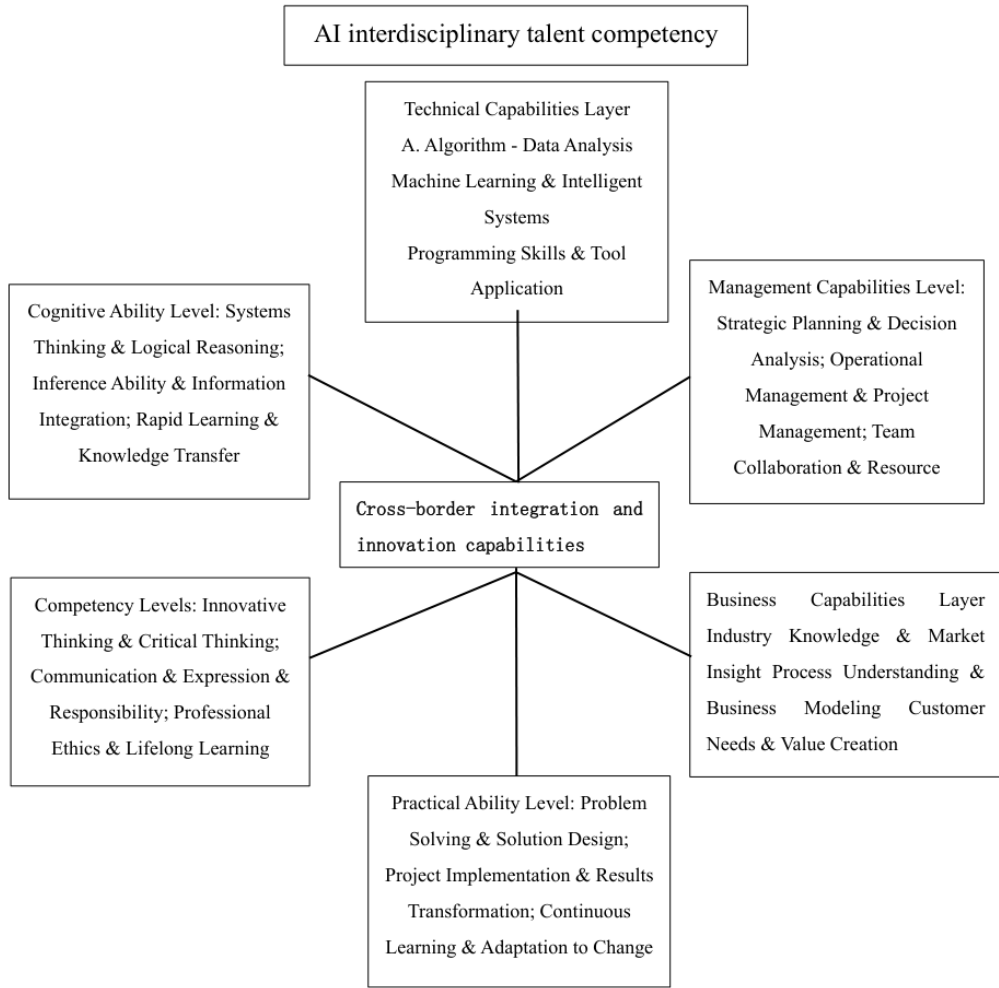


FIGURE 3. Relationship of the Competency Structure of AI-Style Talents

V. DISCUSSION

In the digital economy era, Guangxi's silk industry is not lacking in talent for intelligent transformation, but rather in suitable talent. This challenge is also faced by the broader textile industry, where specific expertise bridging traditional manufacturing with digital operations is crucial for modernization. Cultivating AI-savvy economic management professionals is both a strategic choice to meet the needs of regional economic development and a practical necessity for promoting industrial transformation and upgrading. To address current shortcomings in talent cultivation, such as insufficient technological integration, poor industry alignment, and inadequate collaborative mechanisms, it is imperative to promote educational reform, create a scientifically sound curriculum system, establish a practical platform for deep integration of industry and education, and cultivate a collaborative talent development mechanism involving government, schools, and enterprises. Only through systematic reform and innovation can we cultivate high-quality talent that meets the needs of industrial development, providing strong support for the high-quality development of Guangxi's silk industry in the information

age and promoting the sustained and healthy development of Guangxi's regional economy. With the rapid development of modern information technology, the information wave, characterized by digitalization, networking, and intelligence, is profoundly influencing and changing people's lifestyles.

VI. CONCLUSION

The intelligent transformation of Guangxi's silk textile industry represents a critical evolution within the regional economy, necessitating a fundamental shift in how economic management talents are cultivated. This study concludes that the current disconnect between traditional education and the rapid advancements in AI technology creates a significant bottleneck for industrial upgrading. To overcome these challenges, it is imperative to implement a systematic reform that integrates artificial intelligence with economic management through a dual-core curriculum and project-based learning environments. Furthermore, establishing a robust collaborative mechanism among the government, universities, and enterprises is essential to bridge the gap between academic theory and practical industrial application. By developing a multi-layered competency structure that en-

compasses technical proficiency, management expertise, and industry-specific insights, Guangxi can foster a high-quality talent pool capable of driving innovation and enhancing the global competitiveness of the silk industry. Ultimately, the successful cultivation of these AI-savvy composite professionals will provide the necessary intellectual support to transition the industry from labor-intensive to technology-intensive, ensuring long-term high-quality development for the regional economy.

AUTHOR CONTRIBUTIONS

Conceptualization – Jun Zhang and Qiuyan Tang; methodology – Jun Zhang and Qiuyan Tang; investigation – Jun Zhang and Qiuyan Tang; writing-original draft preparation – Jun Zhang and Qiuyan Tang. All authors have read and agreed to the published version of the manuscript.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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