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Research on the Reconstruction Path of the Internet of Things (IoT) Professional Curriculum System from a Wide-ranging Business Perspective

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Abstract: The booming digital business has put forward higher demands for new types of interdisciplinary compound technical talents, and the traditional Internet of Things (IoT) professional curriculum system urgently needs to be updated and reconstructed. This paper, from the perspective of a Wide-ranging business approach, combined with digital business scenarios and interdisciplinary integration concepts, proposes four major paths for the reconstruction of the IoT professional curriculum system: constructing a "technology–business" double helix structure, improving interdisciplinary integration and scenario design, building industry–university–research collaborative practice platforms, and perfecting an entrepreneurship and innovation evaluation system driven by business capabilities. Only by building a talent training system that matches the new business model under the combined background of business driving force and technological innovation can we better improve the talent quality and employment competitiveness of the IoT major.

Keywords: wide-ranging business perspective, internet of things (IoT) major, curriculum system, reconstruction pathway

1. Introduction

In the context of the accelerated iteration of the digital economy and new business ecosystems, the traditional Internet of Things (IoT) professional curriculum system has overemphasized technical principles and engineering capabilities, leading to insufficient attention to business scenarios and interdisciplinary abilities. This has made it difficult to meet the talent demands of new business formats such as new retail, smart logistics, sharing economy, and cross-border e-commerce. The wide-ranging business perspective emphasizes the symbiotic coupling of the business and technology chains, advocates for interdisciplinary, cross-scenario, and cross-departmental talent cultivation concepts, and stresses the integration of business operations, business data, business management, and business solution design into curriculum design. It aims to build a "technology business" double helix co-cultivation structure, improve practical training and practice systems, and establish a Wide-ranging entrepreneurship and innovation drive and integrated capability evaluation criteria. Research in this direction is not only a proactive response to the study of digital technology application scenarios under the new business education background but also a strategic exploration for deepening professional construction and improving the talent cultivation structure in vocational colleges and applied undergraduate institutions in the new era.

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2. The Necessity of Restructuring the IoT Professional Curriculum System from a Wide-ranging Business Perspective

2.1 Facilitating alignment with the new digital business ecosystem

In the context of Wide-ranging business education, the demand for interdisciplinary compound talents in the new digital business ecosystem is increasingly prominent. The traditional IoT professional curriculum design urgently needs to break through the limitations of a single technology-driven approach to better align with the development needs of new commercial scenarios and business formats. As we enter the digital and intelligent business era, commercial scenarios have shifted from traditional retail and simple supply chain operations to digital technology-driven precision marketing, smart retail, and intelligent supply chain management. Every link in the commercial chain now demands higher interdisciplinary capabilities.

In the past, IoT majors focused on technical design, hardware connectivity, and protocol application. While these aspects could address the basic issues of device interconnection and information collection, they are far from sufficient to meet the Wide-ranging requirements of new commercial scenarios for integrated capabilities, cross-boundary skills, and business insight. In the new retail scenario, designing a Wide-ranging business solution is not just about piling up technologies; it is also a Wide-ranging test of business model design, digital marketing capabilities, commercial operation management, and business data analysis skills. Only by constructing a mutually symbiotic and mutually promoting interdisciplinary structure of "technology – business" can students quickly position themselves and create value in the new business ecosystem.

The Wide-ranging business perspective emphasizes the co-evolution of the commercial and technological chains and advocates the joint construction and cultivation of cross-technology and business knowledge systems. This approach enables students to master the entire process capabilities, from technical design to commercial implementation, and from solution conceptualization to operation management, in application scenarios such as new retail, intelligent supply chains, and business big data. This significantly enhances their employability and career expansion space. A talent cultivation system characterized by interdisciplinary integration and scenario-driven motivation can better adapt future IoT students to the iteration of new business formats and the improvement of commercial chains. It can produce new types of compound professionals who can integrate technological innovation and business operations and co-create commercial value (Yang et al., 2025).

2.2 Beneficial for improving the digital business chain

In the context of Wide-ranging business education, improving the digital commercial chain and constructing a "technology – business" double helix structure has become a key direction for the reform of the IoT professional curriculum system in the new era. The rapid development of digital commerce has made the connection between the commercial and technological chains tighter, and cross-chain integration has become one of the driving forces for commercial scenario design and technological innovation in the new era. The Internet of Things, as the core carrier connecting products, users, and commercial scenarios, naturally takes on the task of linking different chains, coordinating different links, and reconstructing the commercial ecosystem. Traditional curriculum systems often overly focus on hardware design and communication protocols, emphasizing technical details and engineering capabilities, while neglecting cross-disciplinary abilities such as commercial scenario design, commercial data mining, and commercial intelligent decision-making. As a result, the talents cultivated may master technical details but lack macro design capabilities and cross-boundary thinking for commercial chains and operational scenarios, making it difficult to meet the actual needs of digital commerce for Wide-ranging capabilities

and scenario-based design.

To adapt to this shift, curriculum design urgently needs to improve interdisciplinary knowledge structures by adding modules such as commercial scenario modeling, commercial data analysis, commercial operation management, and commercial intelligent decision-making on the basis of existing technologies. Through the "double helix" structure, business and technology courses can complement each other and co-evolve. The new talent standard is no longer limited to "making products" but focuses more on "constructing commercial scenarios" and "designing commercial ecosystems." This enables students to play a more Wide-ranging role as designers and managers in the digital commercial chain, crossing the boundary between technology and business to establish a systematic understanding and design capability for the commercial chain and ecosystem. In this way, the curriculum system can better align with new commercial formats and new employment scenarios, cultivating new types of compound and applied talents who master advanced technologies and understand business operations and scenario design. This will help students realize greater value in the digital commercial chain and new commercial ecosystems (Xiong et al., 2025).

2.3 Enhancing employment and innovative suitability

Under the Wide-ranging business perspective, the new digital business formats and management models put forward higher-level and more diversified capability requirements for IoT professionals. New types of commercial scenarios, such as new retail, smart logistics, sharing economy, and cross-border e-commerce, have set new standards for the quality structure of practitioners: they not only need a solid technical foundation but also need a clear understanding and practical ability in business operations, management models, and cross-departmental collaboration. Compared with the previous focus on technical design and engineering capabilities, it is now more necessary to enable IoT students to play a greater role in business scenario construction, business solution design, and business operation management. The construction and improvement of interdisciplinary courses can provide students with more space to stimulate their innovative design capabilities, expand their career directions, and help them transform into new types of positions such as product managers, business solution designers, digital operation managers, and business scenario design experts, becoming Wide-ranging and cross-border applied talents in the new business formats. The new formats also have increasingly strict requirements for professional quality, which is not limited to mastering a single technology but emphasizes business ethics, cross-departmental collaboration, and operational management capabilities. It advocates the establishment of a complete talent cultivation chain, integrating business management and technology application, business ethics, and cross-departmental collaboration to accurately align the new digital business ecosystem's demands for Wide-ranging capabilities, interdisciplinary quality, and professional quality with curriculum system construction and professional capability cultivation. Only in this way can IoT talents better match the Wide-ranging capability requirements of digital commerce, better adapt to new commercial scenarios and management models, and become an important driving force in the digital business ecosystem in the new era, realizing value co-creation and continuous growth in a broader career space (Shang, 2025).

3. The Reconstruction Path of the Internet of Things (IoT) Professional Curriculum System from a Wide-ranging Business Perspective

3.1 Constructing a "technology + business" double helix course structure

Under the Wide-ranging business perspective, constructing a "technology + business" double helix course structure has become one of the core directions for the construction of IoT professional courses (Pan et al., 2025). Faced with the urgent demand for interdisciplinary, cross-scenario, and cross-chain compound talents in the new commercial

ecosystem, the traditional course structure driven solely by technology is no longer suitable for the talent standards of the new era. Employment and innovation in new commercial scenarios place greater emphasis on a deep understanding of the commercial chain and operational management, requiring students to not only master advanced IoT technologies but also be able to use business thinking to design scenarios, build solutions, guide decision-making, and optimize operations. Therefore, it is necessary to break through the traditional course limitations centered on hardware, protocols, and programming, and add interdisciplinary content such as business operations, business model design, digital marketing, cross-border e-commerce management, and intelligent supply chain management. This will build a "double helix" structure in which commercial and technological driving forces co-evolve and promote each other, expanding the breadth and depth of the knowledge structure and capability system. Under this design philosophy, courses are no longer simply stacked but emphasize interconnection, complementarity, and cross-design, constructing a knowledge integration system "driven by application scenarios." On the one hand, technical courses provide professional capabilities in product design, communication control, data acquisition, and artificial intelligence. On the other hand, business courses supplement the development of capabilities in commercial scenario building, commercial operation management, business solution design, market expansion, and business decision-making. This encourages students to combine technological application with business design, using commercial scenarios as a carrier to master Wide-ranging capabilities across chains, departments, and scenarios in the new commercial ecosystem. Ultimately, the course system, constructed and optimized through the "double helix" structure, can better deliver new types of compound and applied talents who understand both technology and business operations to the new commercial formats and management models, helping students realize greater value and broader development space in the digital commercial environment (Shi & Li, 2025).

3.2 Enhancing interdisciplinary integration and improving digital business scenario design

Under the Wide-ranging business perspective, the reconstruction of the IoT professional curriculum system urgently needs to break through the limitations of traditional technical disciplines, focusing on enhancing interdisciplinary integration and improving the ability to design digital business scenarios, thereby better meeting the new commercial ecosystem's requirements for Wide-ranging quality and cross-chain capabilities. The construction and optimization of digital business scenarios are not simply about piling up technologies but require the mastery and application of interdisciplinary knowledge in management, economics, data science, behavioral science, etc., to cultivate students' abilities to discover, design, and solve problems in real commercial environments. New formats such as new retail, smart logistics, sharing economy, and cross-border e-commerce set higher standards for the coupling between technology and business. Only by enabling students to establish an interdisciplinary perspective in the curriculum and master Wide-ranging capabilities in business scenario modeling, business data mining, business decision-making design, and operational management can they better meet the challenges of new commercial scenarios to professional capabilities and cross-boundary quality (Qi et al., 2025). To this end, colleges and universities should build an experimental and training system driven by business scenarios, introduce actual scenarios such as new retail, intelligent supply chains, cross-border e-commerce, and sharing economy into curriculum design, establish scenario-based training bases and business combat laboratories, and construct a capability training model of "driving tasks with scenarios and driving learning with tasks." Allow students to use IoT technologies in real commercial scenarios, experience the entire process of scenario design, solution construction, operational management, and business decision-making, and cultivate Wide-ranging qualities in cross-disciplinary

collaboration, cross-scenario design, and cross-chain management, so that the curriculum system better meets the talent needs of new commercial formats and new management models. Only by establishing a talent cultivation system that promotes symbiosis through interdisciplinary integration and scenario-driven forces can future IoT students better stand in the new commercial ecosystem and become new types of compound and applied talents who understand technology, business, management, and collaboration.

3.3 Improving the training and practice system and building an industry - research collaborative platform

Under the Wide-ranging business perspective, improving the training and practice system and building an industry – university – research collaborative platform have become key links in the reconstruction of the IoT professional curriculum structure. The new digital commercial ecosystem places higher demands on talents who can work across chains, departments, and scenarios. Simple classroom learning is far from meeting the talent standards of the new era. It is more necessary to build a three-dimensional, diversified, and scenario-based training and practice system to help students hone their interdisciplinary capabilities and business qualities in real commercial scenarios. To this end, first, colleges and universities should build IoT business laboratories in collaboration with other colleges and enterprises, breaking through the closed barriers between faculties and majors, and establishing a Wide-ranging training base that integrates product design, business operations, and business data decision-making. This base can provide students with a learning experience that feels like being in a real scenario, helping them to comprehensively apply technological and business knowledge in design, operation, management, and decision-making, and deepen their understanding of the digital commercial chain and commercial ecosystem. Second, colleges and universities need to implement "dual-system" or "order-based class" cooperation. Through talent cultivation programs jointly built, designed, and implemented by enterprises and colleges, establish an internship and curriculum design driven by real commercial scenarios and improve the on-the-job training system (Jiang, 2025). On the one hand, students can test and apply their professional skills and interdisciplinary capabilities in real commercial scenarios, expand their understanding of new commercial formats and management scenarios, and enhance their Wide-ranging control capabilities in commercial chain collaboration and management operations. On the other hand, enterprises and colleges can also better meet the talent and professional standards of the new commercial formats through the joint cultivation platform, and build a new type of applied talent cultivation system that is "driven by scenarios + interdisciplinary integration + on-the-job training and co-construction." Ultimately, improving the training and practice system and building an industry - university - research collaborative platform will effectively bridge the "last mile" from professional knowledge learning, commercial scenario application to professional capability development. This will make the talent cultivation of IoT majors better adapt to the development direction of the new commercial ecosystem and new management models, truly providing a continuous stream of talent and intellectual support for the continuous innovation and cross-border integration of digital commerce in the new era.

3.4 Improving the assessment and incentive system and building entrepreneurship and innovation driving force

Under the Wide-ranging business perspective, improving the assessment and incentive system and building entrepreneurship and innovation driving force is crucial for constructing a new type of applied and interdisciplinary compound IoT professional curriculum system. Currently, the digital business ecosystem has set new standards for talents, which are no longer limited to the examination of technical capabilities and programming skills but place greater emphasis on the Wide-ranging assessment of business scenario design, business value creation,

and interdisciplinary collaborative capabilities. Therefore, when designing the curriculum system, colleges and universities need to iterate and upgrade the traditional assessment standards and incentive systems to establish a scientific evaluation system that can truly reflect students' Wide-ranging qualities and business scenario problem-solving abilities.

Firstly, it is necessary to improve the evaluation criteria, breaking through the limitations of assessing single knowledge and technical mastery. A Wide-ranging evaluation standard focusing on business solution design capabilities, business value realization capabilities, and interdisciplinary collaborative capabilities should be established. Through interdisciplinary case design, scenario-based business practice, and cross-departmental collaboration experiments, students' understanding and application abilities in new business formats and management scenarios can be better examined and guided (Mu et al., 2025).

Secondly, building innovation driving force is essential. This can be achieved by improving the entrepreneurship and innovation course system and designing practical competitions and research activities, such as business solution competitions, interdisciplinary innovation contests, and business design practice. These activities can stimulate students' motivation to explore new business scenarios and new technology applications, encouraging them to cross disciplinary boundaries, break through the limitations of their knowledge structures, and discover potential, propose solutions, and verify results in cross-chain and cross-scenario contexts. This process helps to cultivate a new type of capability structure characterized by proactive exploration, cross-border design, and collaborative co-creation.

These measures can better align students with the new business ecosystem and management scenarios' requirements for Wide-ranging quality and innovation capabilities. They can also prompt colleges and universities to establish a new type of talent cultivation dynamic cycle, realizing a new applied talent cultivation model that is “driven by business scenarios, based on interdisciplinary integration, and aimed at innovation capability building.” Ultimately, this will provide a continuous stream of capable talents and intellectual support for the development of the digital business ecosystem and new management scenarios.

Conclusion

In summary, the reconstruction of the IoT professional curriculum system from a Wide-ranging business perspective centers on establishing a new talent cultivation paradigm that integrates new commercial scenarios, interdisciplinary integration, and practice-driven motivation. The four major reconstruction paths proposed in this study emphasize the creation of a talent cultivation system that promotes the symbiotic co-evolution of the technological and commercial chains and the joint cultivation across majors under the new commercial ecosystem. Looking ahead, as digital commerce and new technologies continue to iterate, colleges and universities should persistently refine curriculum design, practical training construction, and capability assessment criteria. They should also establish platforms for collaborative talent cultivation among industry, academia, and research, expand the talent needs for compound IoT technical and commercial innovation capabilities in new formats, and propel the quality of talent cultivation under the Wide-ranging business perspective to a new stage.

Conflict of interest

The authors declare that they have no conflicts of interest in this work.

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