Research on Talent Demand, Training System, and Development Model for Domain Knowledge Engineers

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Abstract

Taking the talent demand of national digital transformation as the lever, this approach focuses on common issues in transformation and universal problems in talent cultivation, positioning emerging professions in the digital era—including the information management direction—as domain knowledge engineers. It constructs a cultivation system adapted to domain knowledge engineers and a development model for talent cultivation. In achieving the dual talent cultivation goals of "academic" and "professional" development, it advances students' socialization and professionalization processes, enabling them to build a solid professional foundation during their university tenure while cultivating the knowledge, competencies, habits, and experience required for professional positions, thereby cultivating and reserving human resources with high professional maturity for both supply and demand sides of national digital transformation.

Full Text

Research on the Demand, Training System, and Construction Model of Domain Knowledge Engineers

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Abstract

With the demand for talent in the national digital transformation as a focal point, this study focuses on the common issues of transformation and the universal problems in the process of talent training. It identifies emerging professions in the digital age, including those in information management, as domain knowledge engineers. The research constructs a training system suitable for domain knowledge engineers and a construction model for talent training. In the process of achieving the dual goals of "academic" and "vocational" talent training, it prioritizes the socialization and professionalization of students, enabling them to lay a solid professional foundation during their time in school. This approach cultivates the knowledge, abilities, habits, and experience required for professional positions, preparing and reserving high-proficiency human resources for both the supply and demand sides of national digital transformation.

Keywords: Digital China; Domain Knowledge Engineering; Domain Knowledge Engineer; Emerging Professional Talent

The construction of Digital China serves as a crucial engine for advancing Chinese modernization in the digital era and a powerful support for building new national competitive advantages. With the deep integration of digital technology and the real economy as a key task, this signifies that China's national digital transformation process has entered a new stage of high-quality development [1].

The common challenge in national digital transformation lies in automating, coordinating, and networking the specific behaviors of various entities across physical government, industry, and society. Essentially, this involves achieving exponential multiplication of business operational efficiency, effectiveness, and benefits through digital technology, building upon business-led physical innovation. The critical process of mapping and converting business requirements into technical implementation hinges on the integrated utilization of comprehensive and complex entity knowledge systems. This process has given rise to an original emerging interdisciplinary field aligned with the innovative spirit of "New Liberal Arts" and "New Engineering"—Domain Knowledge Engineering [2]. Professionals who master the theories and methods of domain knowledge engineering, known as Domain Knowledge Engineers [1], are positioned as the most active emerging occupation in the digital era. These engineers can both span and integrate physical businesses to drive innovation and complete the mapping transformation to facilitate technology implementation. They can identify, annotate, integrate, and utilize knowledge from its external characteristics without needing to delve into the internal content of entity business knowledge systems in government, industry, and society, thereby designing and delivering digital transformation solutions tailored to different domains to meet the fundamental needs of entity innovation and digital multiplication in national digital transformation.

From the perspective of disciplinary construction needed for talent cultivation, "New Liberal Arts" and "New Engineering" were established as interdisciplinary programs to reform talent training models and address urgent issues in crosscutting fields [3]. However, in actual economic and social operations, the complex problems that need solving often involve not only interdisciplinary knowledge but also complex knowledge systems spanning industries, domains, regions, and hierarchical levels. The interdisciplinary talent training model based on "New Liberal Arts" and "New Engineering" has thus demonstrated clear limitations, as its breadth and depth are far from sufficient to meet the training needs for domain knowledge engineers. From the perspective of actual employment, as economic restructuring and industrial upgrading accelerate, structural contradictions in labor supply and demand have become increasingly prominent. While general talent faces oversupply, high vocational maturity talent remains in short supply, becoming the primary contradiction in the labor market. Graduates from current vocational education and regular higher education often fail to meet even the most basic professional "should-know" and "should-be-able-to-do" requirements when facing different positions across various industries and domains, let alone the "should-be-able-to-innovate" requirement. The phenomenon of "vocational education not being vocational enough, and regular higher education being too general" has become a common plight, highlighting the urgent need to reflect on vocational education for domain knowledge engineer talent cultivation.

Addressing current challenges requires constructing a training system suitable for domain knowledge engineer professionals and a construction model for talent training. While achieving professional talent training objectives, we must also establish and realize vocational talent training goals by advancing students' socialization and professionalization processes. This enables students to build a solid professional foundation during their university years, cultivating the knowledge, abilities, habits, and experience required for professional positions, thereby training and reserving high vocational maturity human resources for both supply and demand sides of national digital transformation.

2.1 Professional Profile of Domain Knowledge Engineers

Domain knowledge engineers represent the most active labor force in the emerging productivity of future information societies. They are strategic talent for the supply side of national digital transformation to promote industrial upgrading in the information technology service sector [4], and composite talent for the demand side to achieve deep integration between physical operation technology systems and new-generation information technology systems. The emergence of such emerging professional positions reflects the objective needs of information society productivity development [5], helping to alleviate the contradiction between people's demand for high-value knowledge to solve problems, achieve goals, and complete tasks and the generalized supply resulting from the rapid development of digital technology and information explosion. Focusing on advancing knowledge science, knowledge industry, and knowledge engineering development, it can dissolve the constraints on basic human resources needed for the rapid development of the artificial intelligence market, thereby leveraging high-quality and sustainable development of China's digital economy.

Discussions on the responsibilities, training, and development of knowledge engineers date back to 1991 [6], but have yet to attract attention from the IT industry and academia, primarily because domestic digital transformation processes have lagged, with early-stage transformation mostly completed through IT technology-led introduction and construction. As an emerging professional position in the new era, domain knowledge engineers constitute an entirely new category alongside traditional domain engineers such as AI engineers, software system development engineers, architectural engineers, mechanical engineers, and hydraulic engineers. Their job responsibilities and requirements encompass four dimensions: knowledge, capability, habit, and experience. These dimensions represent the highest level of the evaluation system for domain knowledge engineer vocational maturity and form the basic framework for the "should-know," "should-be-able-to-do," and "should-be-able-to-innovate" professional profile, detailed as follows:

Knowledge maturity forms the foundation of professional growth. Before becoming professionals, students must accumulate essential "should-know" and "should-be-able-to-do" knowledge for their positions. This includes mastering the fundamental theories, engineering models, and technical systems of domain knowledge engineering; understanding business knowledge within the boundaries of specific industry segments, domains, hierarchical levels, and regions; grasping knowledge related to deliverables throughout product design, production, and operation processes; and acquiring new-generation information technology knowledge centered on artificial intelligence, including domain knowledge engineering technology and applications, natural language processing technology, and other cutting-edge technologies.

Capability maturity reflects professional competitiveness. Building upon their learning abilities, students must strengthen relevant "should-be-able-to-do" vocational capabilities. This includes mastering the ability to deconstruct, transform, and express cross-industry, cross-domain, cross-disciplinary, cross-professional, and cross-technical system knowledge based on specific tasks within short timeframes. It also encompasses fundamental delivery capabilities applicable to professional positions, such as intelligence compilation, knowledge extraction, requirement reconstruction, and logical expression, as well as creative and top-level design capabilities, functional design capabilities, simulation design capabilities, and system development capabilities to deliver and efficiently implement entity innovation and digital multiplication solutions.

Habit maturity is key to accelerating professionalization. Professional behavioral and thinking habits suitable for efficient work need to be cultivated during university, significantly improving the efficiency of students' transition to professional roles. However, habit cultivation requirements have often not been the focus of vocational or regular higher education. Domain knowledge engineer talent training precisely fills this gap by explicitly requiring students to develop good behavioral and thinking habits. These include the habit of asking questions at any time—promptly resolving anything unclear, ambiguous, or doubtful in work tasks through "asking the internet," "asking books," or "asking people"—as well as professional habits such as divergent-convergent thinking, tacit memorization, active iteration, early delivery, repeated qualitative analysis, and maintaining skepticism when encountering issues.

Experience maturity serves as the leverage for entering the workplace.

Whether students can accumulate rich project experience during university is crucial for achieving the goal of "employment upon graduation with high starting salaries." Experience specifically refers to the number of repetitions across industry types, hierarchical levels, regional types, role types, and tool types traversed during the delivery of digital transformation products for government, industry, and society. Basic components and deliverables of digital transformation products include intelligence compilation reports, user task systems, top-level design reports, and high-fidelity product prototypes. Traversing different industry types such as agriculture, industry, and services, or different hierarchical levels such as central, provincial, municipal, and county levels during delivery, all contribute to enhancing experience maturity.

2.2 Strategic Talent for Supply-Side Industrial Upgrading

In the new journey of Digital China construction, traditional IT enterprises must achieve supply-side structural reform and high-quality development through strategic upgrading. By providing products and services that meet the essential needs of digital transformation for multi-industry user entities in industry, society, and government, they can move beyond the "IT-only" cognitive misconception on both supply and demand sides, activate the endogenous driving force for data element market development, and upgrade from traditional information technology services to modern intelligent services. The key lies in assembling new teams with domain knowledge engineer professional competencies and high vocational maturity to design, produce, and operate digital government, digital industry, digital society, smart city, digital village, and cyberspace security products and services with knowledge engineering product characteristics, gradually creating a second growth curve for enterprise production and operation quality improvement, cost reduction, and efficiency enhancement.

Modern intelligent services represent the deepening and expansion of IT services. Unlike traditional models where IT enterprises establish information systems based on IT knowledge and relying on IT engineers, this new business form is built upon underlying knowledge architectures of industry knowledge, domain knowledge, disciplinary professional knowledge, regional knowledge, and hierarchical knowledge. It encompasses three technical forms: DKE technology (Domain Knowledge Engineering technology), OT technology (Operation Technology), and IT technology (Information Technology), and includes three types of engineer teams: DKE engineers, OT engineers, and IT engineers. Under this new business form, digital transformation service models are constructed by de-IT-izing without departing from IT, and permeating OT without operating OT. Through DKE engineering, it achieves coupling and entanglement between OT engineering and IT engineering to meet digital transformation needs across physical industry, physical government, and physical society.

Traditional IT enterprises, as the main providers of digital transformation market services, represent the primary supply-side entities and future main bodies for modern intelligent service development. However, they have already exposed deficiencies in entity innovation during digital transformation. Therefore, IT enterprises urgently need "high vocational maturity" talent that possesses both entity innovation capabilities and digital transformation abilities to compensate for their limitations in providing only IT services, thereby truly achieving effective supply for digital transformation. Within digital transformation supply-side positions, KE engineers have three main development directions: first, AI-related positions including AIGC application scenarios, prompt engineering, digital annotation, and knowledge management; second, IT-related positions including pre-sales consulting, consulting advisors, requirement analysis, product management, and solution design; and third, research positions including industry user research, data analysis, and research assistant roles.

2.3 Composite Talent for Demand-Side Transformation and Upgrading

Currently, both supply and demand sides of national digital transformation have recognized the limitations of the "IT-only" approach but remain uncertain about the path forward. On one hand, the supply side only provides IT services, resulting in non-incremental efficiency, unsustainable revenue, and unpredictable markets, yet they do not know how to change. More critically, the demand side has begun to emphasize content-oriented business but does not know how to propose systematic, structured, and standardized construction requirements to the supply side. The reasons why the demand side fails to fully understand and express digital transformation needs may include three aspects: first, insufficient cognition, treating information technology and information systems as the essence of digital transformation while overlooking the "internal coupling between business behavior and digital technology," "internal coupling between information and data," and "internal coupling between OT and IT"; second, misconceptions in division of labor, where the demand side views digital transformation merely as adoption of information technology and construction of information system engineering, thus allowing IT departments rather than business departments to lead, manage, and promote digital transformation; and third, supply-side limitations, where traditional digital transformation supply sides lack integrated digital transformation service capabilities combining IT engineering, OT engineering, and KE engineering, as well as high-efficiency allocation of high-quality production factors (land, capital, technology, talent, data), reflecting the limitations of traditional IT enterprises.

Domain knowledge engineers are professionals with high vocational maturity—composite talent capable of working on both the digital transformation supply side and serving digital transformation demand-side positions across various industries, domains, and organizations within the three major categories of digital industry, digital society, and digital government. Demand-side positions for digital transformation have two main development directions: first, entity positions, and second, positions related to digital transformation. Among these, entity positions in various industries, domains, and organizations across the 19 national industry categories offer greater quantity and broader scope. In these entity positions, domain knowledge engineers, equipped with training in knowledge maturity, capability maturity, habit maturity, and experience maturity, can quickly enter specific positions and tasks. They can identify, annotate, integrate, and utilize cross-industry, cross-domain, and cross-disciplinary knowledge required for various positions to deliver work outcomes, adapting to entity operation positions in all three industries, entity operation positions in organizations such as science, education, culture, and health, and entity operation positions in various government agencies and front-line law enforcement. Beyond demand-side entity positions, KE engineers can also work in digital transformation-related positions within various industries, domains, and organizations across the 19 categories, including positions in information centers/information management departments, primarily responsible for proposing their own digital transformation needs and organizing optimization and communication of entity innovation plans with digital transformation supply-side enterprises.

3.1 Training Objectives

To enable students to accumulate necessary academic and vocational reserves for both supply and demand sides of national digital transformation during their university years, the training objectives for domain knowledge engineers have become an organic unity of students' own academic and career goals. Academic goals focus more on shaping student values, knowledge acquisition, and capability cultivation, enabling them to develop sound personalities, persistent beliefs, and excellent character. Students should acquire systematic thinking, structured knowledge capabilities, academic temperament, humanistic spirit, and endogenous motivation required for digital transformation modern intelligent service industries, along with the ability to engage in cross-industry, cross-domain, and cross-disciplinary communication and learning based on specific tasks within short timeframes. The core of vocational goals lies in ensuring students possess certain vocational maturity upon graduation. Therefore, student training should be oriented toward vocational maturity in knowledge, capability, habit, and experience, combining structured training with repeated classroom teaching, project training, and project practice, as well as traversing various role positions. This cultivates students' abilities, habits, and experience in reviewing, expanding, deepening, and reusing knowledge, enabling them to achieve high vocational maturity during their university years.

Overall, the training objectives for domain knowledge engineers are to cultivate high-quality applied, composite, and innovative talent with firm political ideology and comprehensive development in morality, intelligence, physical fitness, aesthetics, and labor skills. Graduates should meet the basic needs of comprehensive positions in digital transformation, master the knowledge, capabilities, habits, and experience of domain knowledge engineers, adapt to three key types of domain knowledge engineer positions, and possess certain vocational maturity upon graduation.

3.2 Curriculum System

Courses constitute the fundamental units for achieving talent training objectives, with professional talent training primarily realized through curriculum teaching [7]. Given the interdisciplinary and integrated characteristics of domain knowledge engineering and its higher requirements for student qualities in knowledge, capability, habit, and experience, curriculum design must address four key aspects: First, emphasize cross-boundary capabilities by strengthening training across disciplines, majors, domains, hierarchical levels, and regions, enhancing knowledge identification, annotation, integration, and utilization, and offering a series of domain knowledge engineering courses. Second, emphasize professionalism by strengthening fundamental professional knowledge. Based on two foundational textbooks—*Domain Knowledge Engineering* and *Modern Intelligent Services*—establish professional foundation courses to help students early on develop basic cognition of domain knowledge engineering models, domain knowledge engineers, engineering product production methods and processes, industry forms and business models, and traditional digital transformation supply and demand sides. Third, emphasize intelligence by strengthening new-generation information technology knowledge centered on artificial intelligence and training in AI technology applications such as generative pre-training to expand students' professional role scope. Fourth, emphasize practicality by strengthening knowledge repetition, application, and delivery, enhancing traversal and authentic delivery of the entire project lifecycle. Offer project training and project practice courses, and specifically add vocational maturity/domain knowledge engineer level certification during student career guidance.

3.3 Teaching Methods

China's traditional teaching methods emphasize "knowledge-based" learning, with teaching models generally involving instructors delivering all theoretical knowledge in classrooms, after which students proceed directly to internships [8]. Such teaching methods make it difficult for students to acquire the knowledge, capabilities, habits, and experience required for vocational maturity.

To cultivate high-quality applied, composite, and innovative talent with certain vocational maturity upon graduation, mature domestic domain knowledge engineer teams have developed a "four-in-one" teaching model through approximately five years of teaching practice, integrating classroom method, training method, practical method, and career growth assessment.

The **classroom method** involves instructors guiding students hand-in-hand through knowledge acquisition while encouraging self-reflection to complete learning, achieving comprehensive improvement in knowledge, capability, habit, and experience. This approach emphasizes guiding students in paths and methods for acquiring and integrating knowledge rather than focusing on professional methods themselves. The **training method** uses classic real-world enterprise projects as teaching vehicles, enabling students to complete structured repetitive training and full-process position traversal for projects in training environments. The **practical method** focuses on authentic enterprise project practice for the purpose of vocational maturity cultivation, using real enterprise environments and project operations as teaching vehicles. Through "student project practice + enterprise performance evaluation" office-based arrangements and internships, it integrates student capabilities with market demands, comprehensively enhancing students' social adaptability and professional competitiveness. Both training and practical methods adhere to the guidance rules of domain knowledge engineering models and task requirements that both instructors and students must follow. Additionally, instructors can supervise students in repeatedly practicing domain knowledge engineering methods to solidify their self-constructed paradigms. **Career growth assessment** arranges teaching organization according to actual employer production organization forms, synchronizing the *Career Assessment Report* based on the vocational maturity/domain knowledge engineer level evaluation system with relevant enterprises, allowing high vocational maturity students to obtain early employment offers while still in school.

3.4 Faculty Team

The faculty team directly affects the quality and level of domain knowledge engineer talent training. Beyond conventional requirements such as educational background, professional title, age, ethics, and knowledge reserves, instructors' engineering practice experience is the essential condition for their competence in domain knowledge engineering talent training. However, lack of engineering practice is a widespread problem among engineering faculty in universities [9]. This paper proposes that the faculty team for domain knowledge engineer training should consist of both university mentors and enterprise mentors. University mentors primarily undertake teaching of existing professional courses in their schools, being responsible for student learning outcomes. Enterprise mentors mainly refer to frontline experts, engineers, project managers, domain knowledge engineers, and other high-level positions in enterprises. They undertake teaching of the distinctive domain knowledge engineering curriculum system, including guiding students in project training and practical projects, and are responsible for students' output deliverables. They also undertake assessments of students' vocational maturity/domain knowledge engineer levels during their university years.

To stimulate the endogenous motivation of the faculty team, a mentor selection mechanism must be established. University mentor selection should focus on political quality and moral standards, teaching ability and academic attainment, innovative consciousness and mentoring experience, while comprehensively considering basic conditions such as age, major, and educational background, as well as factors including professional level, cumulative frontline teaching time, teaching achievements, quality and quantity of certifications obtained, number of research projects organized or participated in, and professional identity.

Enterprise mentor selection should focus on professional ethics, theoretical foundation, product capability, and engineering experience, while comprehensively considering basic conditions such as age, major, and educational background, as well as factors including domain knowledge engineer level, cumulative frontline work time, number of projects led and participated in, project experience, and professional identity.

4.1 Industry-Education Integration Engineer Training Model

Industry-education integration combines school teaching activities with actual enterprise production processes, integrates students' theoretical knowledge learning with off-campus social practice, and merges enterprise and university teaching. Its essence lies in the integration of production and education training [10]. Training programs, as organized specialized training activities requiring cross-boundary cooperation between industry and education, have become a fundamental model for cultivating domain knowledge engineers. This model uses distinctive training programs as the main thread and constitutes a teaching process conducted over a half-year cycle for junior and senior students in regular universities.

The domain knowledge engineer training program integrates classroom training, product training, and project practice in a progressive and connected model to achieve deep-level enhancement of students' vocational levels in knowledge, capability, habit, and experience. The **classroom training** phase lasts 20 days, using both offline and online instruction, including introductory courses, comprehensive knowledge courses, engineering capability courses, and practical review courses. Instructors provide feedback on student questions while encouraging students to independently solve problems through repeatedly watching recorded sessions and discussing with classmates. Multiple performance evaluations are conducted after the training, encouraging students to leave high-score records. The **product training** phase lasts 30 days, adopting a task-based model by project teams, including engineering foundation capability training, creative and top-level design capability training, scenario design capability training, and simulation (prototype) design capability training. Students deliver work outcomes according to task requirements and reference examples, with outcomes evaluated by training instructors who encourage students to obtain higher evaluations through multiple iterations. The **project practice** phase generally lasts 4-5 months, recommending outstanding students from classroom training and product training to join company project teams for office-based work. Project managers arrange role positions and work tasks, with student performance primarily evaluated by project managers.

4.2 University-Enterprise Collaborative Major Development Model

Academic education has not yet reached a unified definition of "major." Integrating interpretations from *Cihai* and scholars such as Zhang Bingsheng [11], this paper defines a major as the fundamental unit for talent cultivation in universities based on specific professional divisions in economic society and disciplinary development.

From a knowledge perspective, any major has a specific knowledge system. However, most majors under regular higher education only involve descriptive knowledge of the discipline's professional knowledge itself and do not possess procedural knowledge of industry knowledge, domain knowledge, hierarchical knowledge, regional knowledge, etc., required when professionals face specific positions in particular industries and domains. Even majors like Information Management and Information Systems (hereinafter referred to as IMIS), which involve both IT industry knowledge (such as data structures, computer networks, data visualization) and other disciplinary knowledge like economic management, manage knowledge in a generalized and universal manner [12], still failing to meet the essential needs of national digital transformation within specific task boundaries. Therefore, a new approach is needed that can identify, annotate, integrate, and utilize knowledge across industries, domains, hierarchical levels, and regions from external characteristics without entering the internal content of various professional knowledge systems, centered around specific tasks and objectives—namely, domain knowledge engineering knowledge.

Against the backdrop of urgent demand for domain knowledge engineering knowledge on both supply and demand sides of national digital transformation, this paper argues that university-enterprise collaborative major development in the direction of domain knowledge engineering will inevitably become the trend. This process must rely on specific university disciplines, center on improving talent training quality, optimize existing university faculty teams, introduce enterprise mentors who simultaneously possess specific industry knowledge, domain knowledge, hierarchical knowledge, regional knowledge, and disciplinary professional knowledge, and develop talent training programs with participation from mature domain knowledge engineers. Based on existing curriculum systems, it should integrate distinctive domain knowledge engineering curriculum systems and incorporate methods and means for training domain knowledge engineers into the teaching reform process to continuously meet the professional talent demands for domain knowledge engineers in national digital transformation.

4.3 Modern Industrial College Construction Model

Promoting applied talent training in universities is key to high-quality development of China's higher education. According to the *Modern Industrial College Construction Guidelines (Trial) (Letter No. 16 [2020] from the Department of Higher Education)*, China aims to build a batch of modern industrial colleges with distinctive industry characteristics and close industry connections by around 2024, giving rise to digital transformation industrial colleges in the direction of domain knowledge engineering. The industrial colleges referred to in this paper are neither the "industry universities" first established in the UK in the early 21st century nor vocational and technical colleges [13], but rather industry-education-research integrated colleges.

Digital transformation industrial colleges are emerging distributed industrial colleges jointly established by enterprises and universities against the backdrop of national digital transformation. Relying on leading industry enterprises and centered on academic innovation in domain knowledge engineering and industrial innovation in modern intelligent services, these colleges are based on information-oriented majors such as information management, software engineering, computer science and technology, computer application technology, and library and information science in regular universities, or on disciplines such as philosophy, law, economics, and management. They aim to innovate collaborative education mechanisms among industry, education, and research to cultivate high-quality applied, composite, and innovative talent—domain knowledge engineers—who meet the practical needs of digital transformation-related positions across all national economic industries and multiple categories (digital government, digital industry, digital society, digital villages, smart cities, cyberspace security, etc.), and who possess certain vocational maturity upon graduation.

Beyond reorganizing disciplines and majors, reconstructing curriculum systems, resetting teaching methods, and restructuring faculty teams, the construction focus of digital transformation industrial colleges also involves building a teaching platform—the Domain Knowledge Engineering Control Platform (hereinafter referred to as the "DK-EC Platform"). This digital teaching platform aligns with and deeply integrates the theoretical system of domain knowledge engineering, the lifecycle of domain knowledge engineering products, and the training model for high vocational maturity domain knowledge engineers. It can produce all production process deliverables for domain knowledge engineers (including both instructors and students). The DK-EC Platform is a digital platform for realizing engineering foundation capabilities, creative/top-level design capabilities, functional design capabilities, simulation design capabilities, platform development capabilities, business operation capabilities, and team organization capabilities. In the future, the platform will employ interactive large language models that can be trained and nurtured into industry-specific, domain-specific, hierarchical, and regional "small models"—digital domain knowledge engineers that integrate laborers, means of labor, and objects of labor—representing important output achievements of the industrial college.

Based on analysis of talent demand for domain knowledge engineers—the most active labor force in the digital era—this paper has constructed a training system suitable for domain knowledge engineer professionals, including training objectives, curriculum system, teaching methods, and faculty team. Building upon this training system, it provides specific guidance for building domain knowledge engineer talent teams through three models: domain knowledge engineer training program advancement, university-enterprise collaborative major development, and modern industrial college construction. To ensure effective operation of these three construction models, a complete set of safeguard measures must be established: first, student employment safeguards to stimulate students' endogenous motivation through recommended employment; second, faculty team safeguards focusing on strengthening instructors' endogenous teaching motivation; third, curriculum resource safeguards, including distinctive course resources for the domain knowledge engineering direction such as textbooks, PPTs, lecture notes, videos, question banks, and project cases; and fourth, operation safeguards, where industry and education parties establish operation teams conforming to specific construction models with clearly defined responsibilities. In the future, universities can lead the multi-party collaborative construction of domain knowledge engineer practice bases to achieve deeper-level industry-education-research collaborative education.

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Note: Figure translations are in progress. See original paper for figures.