

Blockchain + Industry-Education Integration Enterprise: Coupling Path and Platform Construction

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ABSTRACT

As the driving force of vocational education development and reform, industry-education integration enterprises have entered the critical period of construction, and put forward the construction demands of symmetrical organizational structure, transparent data status, information resource sharing, and personalized talent training. Combining the characteristics of blockchain technology with the integration of industry and education provides a new idea for solving the development dilemma of pilot enterprises. Through in-depth exploration of the coupling path of "blockchain + industry-education integration enterprise", functional structure hierarchical design module, operation rule module, intelligent program module and supervision and incentive module, the chain information service platform of industry-education integration enterprise is constructed to provide technical support for accelerating the construction of industry-education integration enterprise.

Keywords: Industry-Education Integration, Vocational Education, Block Chain, Coupling

1. INTRODUCTION

As a symbolic policy product formed by the deep integration of industrial chain and education chain, the industry-education integration enterprise is closely related to the development process of vocational education. Industry-education integration enterprises are the core force to promote China's vocational education reform and improve the comprehensive system of vocational education, and the main force to fill the supply side gap in the labor market and optimize the structure of economic growth. In September 2019, the Implementation Plan of the National Pilot Project for Integrated Construction of Industry and Education, issued by relevant Chinese authorities, pointed out that: "Through five years of efforts, the pilot construction layout about 50 fusion of cities, education in the pilot city and province in the domain of building to form a regional characteristic of the integrated production and education sectors, across the country to foster more than 1 m fusion enterprises" production and education, illustrates the fusion of enterprise production and education construction will tend to scale, the development of regionalization and integration oriented. At present, the fusion of enterprise production and education construction process has made phased achievements, but in the big data information technology support aspects there are still some shortcomings, leading to asymmetry of organizational structure in the construction of the pilot, inadequate resources utilization state, data is not transparent and talent training without personality issues, such as the

integrated production and education to further deepen the construction enterprises to form the block. Therefore, in order to implement the informationization development of vocational education, effectively solve the problem of the fusion of enterprise existing production and education, this paper attempts to block chain technology characteristics and the process of teaching for the construction of the integrated enterprise, the combination of hold the pulse of The Times development, breaking the traditional constraints, through deep exploring "block chain + integrated enterprises" production and education of the coupling paths, To construct the chain information service platform of the enterprise integrating industry and education.

2. STUDY LOGIC AND STARTING POINTS

2.1 What is Blockchain

The technical concept of blockchain originated from the underlying technology of Bitcoin. In 2019, the Blockchain White Paper issued by the China Academy of Information and Communication defines blockchain as "an accounting technology that is jointly maintained by multiple parties, uses cryptography to ensure transmission and access security, and can achieve consistent storage of data, which is difficult to tamper with and prevents repudiation. Block chain is the nature of the data is distributed encryption processing and storage of a new type of computer technology, a decentralized, autonomy, openness, extensibility,

traceability, tamper-proof, anonymity and collective maintenance, technical characteristics, such as in the real application of both "tool" and "thinking" of a double value [1].

2.2 Blockchain + Vocational Education, the Coupling of Blockchain + Industry-Education Integration Enterprises

2.2.1 Blockchain + vocational education

In April 2018, China's Ministry of Education issued the "Education Informatization 2.0 Action Plan", pointing out that "actively promote 'Internet + education', adhere to the core concept of the deep integration of information technology and education, adhere to the basic principle of application driven and mechanism innovation, establish and improve the sustainable development mechanism of education informatization" [2]. It also emphasizes the important impact of new technologies such as blockchain and big data on education development and talent cultivation. Previously, China's Ministry of Industry and Information Technology of China white paper block chain technology, development and application of pointed out that "block chain system of transparency, the data do not tamper with the characteristics, fully applies to credit management, enters a higher school students employment, academic credentials, cooperative, etc., have important value for the healthy development of the education employment". As an important part of the modern national education system, vocational education is an important outlet for skilled labor talents. However, there are still some disadvantages such as asymmetric information resources, imperfect certification and evaluation system, and unformed multi-interest community [3]. Vocational education stands in the era of education informatization development and reform, and is in urgent need of a reasonable collision with blockchain technology, so "blockchain + vocational education" came into being.

2.2.2 Blockchain + industry-education integration enterprise

China's National Development and Reform Commission and the Ministry of Education jointly issued the "construction of production enterprises to implement teaching fusion method (try out)", "fusion of enterprises production and education" is defined as deeply involved in the fusion, university-enterprise cooperation, production and education in vocational colleges and universities, institutions of higher learning education and deepen reform plays an important role, behavior standard, effective, create more social value, To improve the quality of technical skills talent training, enhance attractiveness and competitiveness, with a strong leading demonstration effect of the enterprise.

This policy defines clearly the functional characteristics of enterprises integrating industry and education in the aspects of subjectivity in vocational education construction, high quality education and social value demonstration. To give full play to the fusion of enterprise production and education function effect, speed up resolution of the fusion of enterprise existing production and education demands, using block chain technology to build the integrated production and education enterprise integrated information management platform will become the depth of "block chain + professional education" under the coupling again innovation and further deepen the construction path to the fusion of enterprise production and education [4].

3. THE COUPLING PATH OF BLOCKCHAIN + INDUSTRY-EDUCATION INTEGRATION ENTERPRISE

The dual nature of the industry-education integration enterprise determines the complexity of its construction process. Combining with the technical principles and characteristics of blockchain decentralization, distributed accounting, trust mechanism, traceability, openness, tamper-proof and other technical principles and characteristics, the diversified construction subjects of the industry-education integration enterprise can be "connected" [5]. Explore the coupling path of organizational structure, data trust, resource utilization and talent training, build an alliance chain of equal relationship, free trade, mutual trust, cooperation and consensus, information sharing and efficient interconnection, and accelerate the formation of collaborative construction and sustainable development of industry-education integration enterprises [6].

3.1 Realize Diversity and Equality and Strengthen Alliance Interaction

Block chain is the essence of a not dependent on any center was established through cryptography, fully distributed books database, distributed to an account, a distributed communication, distributed storage, the distributed characteristics is to block chain each participant in the system is a system of nodes, each node is common preservation and maintenance of the whole system complete electronic books. When the decentralized characteristics of blockchain are combined with the integration of industry and education, the original organizational structure dominated by the government and subordinated by other organizations will be adjusted to a flat organizational structure with equal relations between all subjects. Each subject involved in the construction of the industry-education integration enterprise plays a management role with different functions, and on the basis of realizing the freedom of "trade" between the two parties, the consensus on goals is strengthened. When the fully

distributed characteristics of blockchain are combined with the integration of industry and education, the distributed blocks will not only include government departments, industry organizations, pilot enterprises and vocational colleges, but also passive recipients such as teachers and student groups will occupy a "place" in the integration system. This structural change strengthens the connection and interaction between managers and executives, highlights the terminal demand in the construction process of industry-education integration enterprises, and helps pilot enterprises and vocational colleges to correctly grasp the trend of integration.

3.2 Establish Technical Trust and Improve the Data Chain

Blockchain can be widely used, largely depends on its efficient and secure running procedures, can accurately record every change of data on the chain, privacy protection and data sharing [7]. The trust mechanism model based on data code can effectively regulate the behavior of each participant, and build the relationship structure of consensus, cooperation and collaboration between each block. When the blockchain data trust mechanism is combined with the industry-education integration enterprise, on the one hand, it will help the industry-education integration enterprise to reconstruct the social trust system, ensure the data security in the fusion process, and improve the credibility of the fusion data [8]. On the other hand, the transparent and visual processing of the fused data can help to give play to the feedback and supervision function of the data, and force the enterprises of the integration of industry and education to strengthen their own norms of behavior and improve the consciousness of construction and innovation. When the traceability of blockchain is combined with the integration of industry and education, a complete integration data chain formed by numerous data nodes becomes a favorable basis for government departments to carry out supervision, enabling them to "trace the source and follow the trail" when implementing the reward and punishment system and exit mechanism.

3.3 Facilitate Resource Sharing and Simplify Redundant Links

Blockchain technology is a logical unity of "change" and "constant". "Change" refers to the distributed and open characteristics of blockchain. It can record and share all information and uploaded data of users on the chain except for encryption, and carry out timely update and real-time tracking. "Constant" refers to the tamper-proof and fault-tolerant property of blockchain, which can effectively prevent the risks caused by malicious modification and sudden system failure, and ensure the reliability and stability of data. When block chain of

openness and integrated enterprise, the combination of production and education model pilot enterprises will become the main chain of distributors, its will rich managerial experience and high quality learning resources through the chain block technology transfer to all of the integration of enterprises and vocational colleges education system, both help merging resources sharing and make full use of, It also provides an important information resource carrier for promoting the professionalization and urbanization development of industry-education integration enterprises. When block chain tamper-proof and integrated enterprise combining production and education, to facilitate multiple subject for the construction of the pilot enterprises between information, information fusion of vocational colleges, teachers and students of the school information such as the storage and query of the two-way, help to eliminate redundant certification part of the administrative work, simplify the process, improve the efficiency of management.

4. THE CONSTRUCTION OF CHAIN INFORMATION SERVICE PLATFORM FOR ENTERPRISES INTEGRATING INDUSTRY AND EDUCATION

The industry-education integration enterprise chain information service platform can be divided into four modules: functional structure, operation rules, intelligent program, supervision and incentive. Among them, functional structure module is the main body, operation rule module is the foundation, intelligent program module is the means, supervision and incentive module is the auxiliary [9]. The interaction between modules drives the orderly operation and operation of the platform system. By balancing the rights and responsibilities of all parties, broadening communication channels, strengthening the circulation of elements, and achieving mutual benefit and win-win results, diversified construction subjects can truly form an industry-education integration community, and jointly promote the construction process of industry-education integration enterprises.

4.1 Functional Structure Module

The functional structure module is the main module of the enterprise chain information service platform of the integration of industry and education, which defines the basic functions and network structure of various ports in the platform, and is the operation basis of the whole integration system. The platform is mainly composed of four types of ports: local governments, industry organizations, all pilot enterprises and all vocational colleges [10]. Users can choose to access corresponding ports according to their own types when registering and become terminal users of the platform. Local governments are mainly responsible for observing

the construction of industry-education integration enterprises within their jurisdiction. They need to implement the policies on the construction of industry-education integration enterprises issued by the central government based on their own industrial and economic conditions and social development, and upload the specific implementation process and results to the information platform. Industry organizations can use the information platform to share advanced industrial information, enterprise management experience, employee training experience and all kinds of financing information, and issue analysis reports on the integration of industry-education integration enterprises based on the feedback data of each end, for government departments and industry-education integration enterprises to learn, reference and use. Pilot enterprises as the construction of ontology, need comprehensive reception and fully understand all the transfer information, and according to their own real fusion situation real-time updates of specific cooperation mode and the fusion data, some demonstration enterprises still need to the successful experience of cooperation between colleges and enterprises practice case and relevant professional skills teaching resources sharing information platform. Terminal of vocational colleges can be divided into university-enterprise cooperation, teachers and students, head of the group, and allocation of enterprise funds, professional and curriculum setup, the construction of teaching staff, the talent training scheme and complete each student's learning process and so on must be the true record and upload platform, enables the other port to check the fusion effect, timely understand terminal training needs.

4.2 Running Rule Module

The operation rule module is an essential basic module in the enterprise chain information service platform of the integration of industry and education. It is based on the consensus mechanism of blockchain technology as the design concept, by following certain rules of information screening, resource transmission and other platform updates, so that highly dispersed users can reach consensus efficiently, make them trust each other, and provide guarantee for maintaining orderly and smooth operation of the system. Platform update rules mean that all information resources uploaded by end users must be broadcast on the whole network first, and the whole system can be updated only after 51% or more users have approved and supported this information after system review. This rule can effectively ensure the authenticity of fusion information and reduce redundant authentication links between construction subjects in the process of testing results. By constructing module, operation rules to ensure that the platform information will not be malicious tampering with violations, to enhance the platform credibility, make the construction of the main body of each

platform operation behavior between each other, and finally formed by the fusion results between colleges, student learning outcomes, such as data information consensus, prompting them to abide by the system of intelligent application and maintenance operation process of the system. The system consensus mainly includes the consensus of integration results between the government and enterprises, the consensus of effective utilization of resources between enterprises and vocational colleges, the consensus of educational background and student skills between industry and vocational colleges.

4.3 Intelligent Program Module

The operating mechanism of intelligent program module is a kind of intelligent contract formed by programming language on the basis of a certain consensus reached by the main body. When the system confirms that the specific triggering conditions are met, the preset program will be activated and automatically executed according to the contract content. Once the automatic program is triggered, the system user cannot tamper with the data. Intelligent program module is the key to improve the operation efficiency of the platform, and also an important means to ensure the behavior of the subject. It mainly includes enterprise training certification program, enterprise construction supervision program, enterprise investment allocation program and student achievement certification program.

4.4 Supervision and Incentive Module

The supervision and incentive module is an auxiliary module in the chain information service platform of the industry-education integration enterprise, which is mainly used to maintain and stimulate the construction enthusiasm of the industry-education integration enterprise. Its operating mechanism is to evaluate the construction process and integration results of pilot enterprises through the system algorithm. According to the evaluation results, pilot enterprises with significant integration effect are encouraged in the form of virtual currency, while the pilot enterprises that are not active in construction and integration are punished. When the pilot enterprise and vocational colleges carry out a certain depth of integration, the system will automatically issue a certificate of work (POW) for the pilot enterprise and give it a certain amount of virtual currency as a reward. Pilot enterprises can earn more virtual coins by docking with multiple vocational colleges, increasing multi-party investment, adopting a variety of cooperation modes, developing a variety of teaching products and other methods of deepening integration. After accumulating a certain number of virtual coins, pilot enterprises can apply to government departments through the platform for tax exemption, financial support, land approval and other preferential

policies to exchange for equivalent value. If the number of virtual coins accumulated by the pilot enterprise is 0 after a period of construction, the relevant construction department will review its qualification and give a warning to quit as punishment. The supervision and incentive mechanism can not only standardize the construction behavior of pilot enterprises, improve the efficiency of industry-education integration, and make them maintain the operation order of the platform spontaneously; In addition, more ordinary enterprises can actively participate in the construction of industry-education integration enterprises in order to obtain preferential policies, expand the construction team, gather more consensus, and lay a solid foundation for promoting the professionalization, urbanization and large-scale development of industry-education integration enterprises.

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