

# Construction and Application of the Cross-border E-commerce Talent Database Based on the International Trade Skills Competition

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## Abstract

**With the continuous innovation of Internet technology, China's cross-border e-commerce industry has developed rapidly, but the current shortage of cross-border e-commerce talents has become an obstacle factor to the development of the industry. It is of great significance to help cross-border e-commerce enterprises solve the problem of talent shortage through effective ways. This project first of the current cross-border electricity industry development situation and talent demand analysis, and then to international trade skills competition as the breakthrough point, using artificial intelligence technology integration competition participants information and enterprise recruitment information, then build data model, establish cross-border electricity business talent database for enterprises, so as to effectively alleviate the problem of high quality talent shortage.**

## Keywords

**The International Trade Skills Competition; cross-border e-commerce; talent database.**

## 1. Foreword

Internet technology and modern information technology have driven the rapid development of China's cross-border e-commerce industry. At the same time, the demand for cross-border e-commerce talents in the industry is also increasing. Based on the background of school-enterprise cooperation, this paper in international trade skills competition, for example, the competition as a window of college students and cross-border electricity business communication, and integrate competition information and electricity enterprise data, based on modern information technology, provide cross-border electricity enterprise high quality cross-border e-commerce talent, and improve students professional practice ability, to solve the problem of cross-border electricity talent gap.

## 2. The Development Status of Cross-border E-commerce Industry

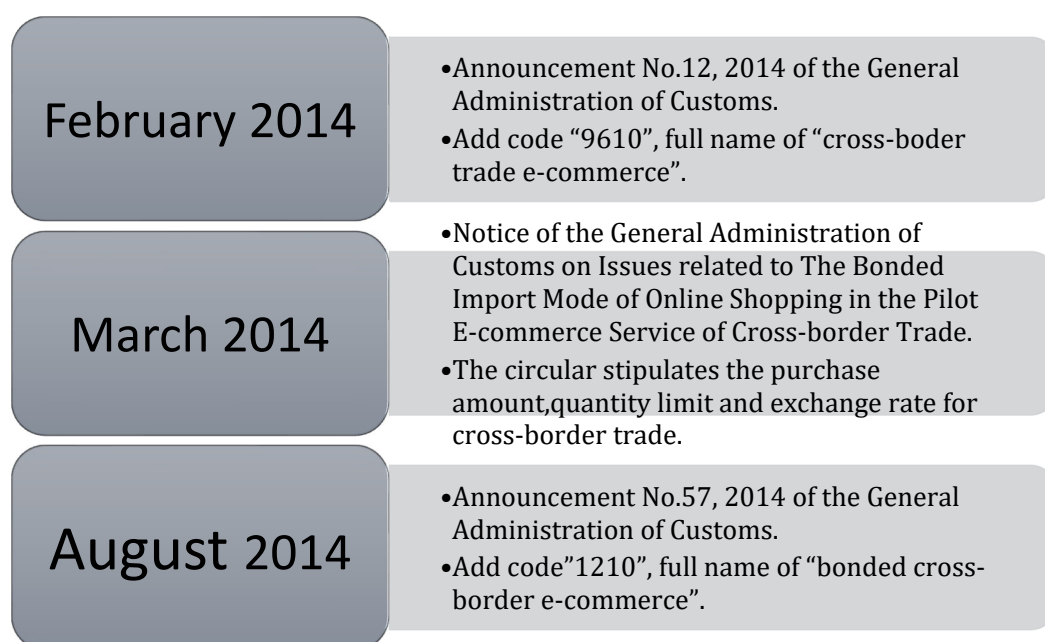
### 2.1. Development Status of Cross-border E-commerce Industry

#### 2.1.1. The Development Process and Life Cycle of China's Cross-border e-commerce

At the beginning of the 21st century, the atmosphere of overseas business, overseas study and traveling abroad was prevalent, and there were some purchasing upsurge caused by Chinese people who are studying or working abroad. With the improvement of living standards, Chinese people have shown a strong enthusiasm for foreign cosmetics, watches, leather bags and other items, and the gradually growing part-time cross-border online shopping can not meet domestic consumers. Therefore, some overseas online shopping websites and enterprises were born, which is the embryonic stage of the development of cross-border e-commerce in China.

From 2004 to 2013, cross-border e-commerce began to take shape, and the rapid development of "Internet +" technology has laid the foundation for the formation of cross-border e-commerce. During this period, computers and the Internet have gradually entered thousands of households, and people's shopping habits and shopping scope have changed dramatically. In 2007, Taobao founded the Taobao Global Shopping platform, which sellers can use to sell the high-quality overseas goods. At the same time, consumers can also buy their favorite products through this platform, truly realizing consumers' wish of "buying the world without leaving home". Global purchasing has strengthened the market of the cross-border online shopping industry, but also promoted the completion of the cross-border online shopping market system, and gradually formed the emerging industry of cross-border e-commerce.

Since 2014, cross-border e-commerce has achieved unprecedented development. In 2014, the government issued a series of policies (see the figure below for specific policies) to recognize the cross-border e-commerce model. China's cross-border import e-commerce has achieved a blowout growth in quantity and scale, and the competition in cross-border e-commerce is becoming more and more fierce, promoting China's cross-border trade in a mature direction. According to statistics, in 2014, China's overseas purchasing market transactions exceeded 150 billion yuan, twice as large as that of in 2013.



**Figure 1.** Cross-border e-commerce Policy in 2014

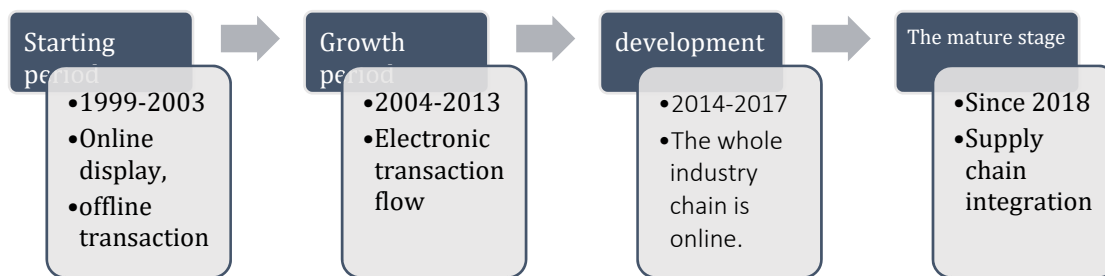


Figure 2. Life cycle of cross-border e-commerce in China

### 2.1.2. The Development Status of Cross-border E-commerce in China (2020)

Since the outbreak of the novel coronavirus epidemic in 2020, global trade has been shrinking. Under the leadership of the Party and the government, China has actively fought against the epidemic and resumed work and production at the shortest possible speed, becoming the only major economy in the world to achieve positive growth in trade in goods. China's total import and export value in 2020 will exceed 31.54 trillion yuan. As an indispensable part of the development of foreign trade, cross-border e-commerce is also booming. According to customs statistics, in 2020, the import and export list was checked and released through the customs cross-border e-commerce management platform, an increase of 63.3% year on year. The import and export of cross-border e-commerce reached 1 trillion yuan, up 31.3%. Under the background of the domestic and international double-cycle development, the scale of China's cross-border e-commerce market will show a trend of further expansion.

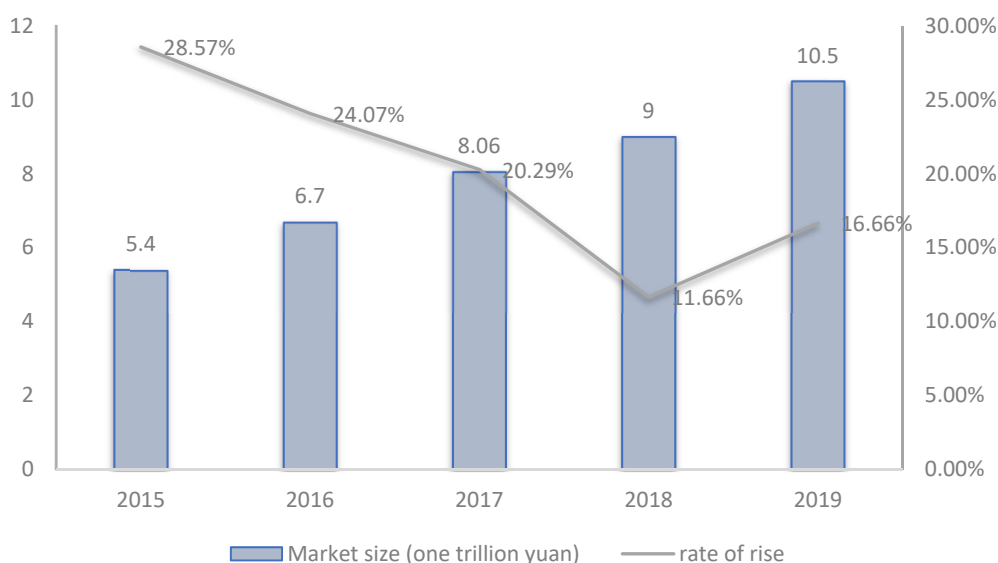
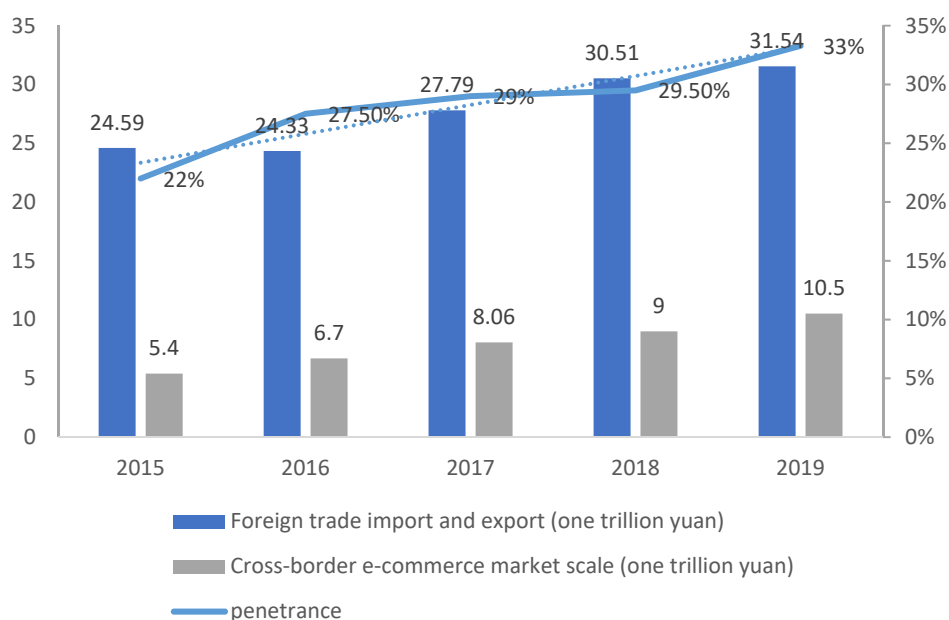


Figure 3. Size and growth rate of China's cross-border e-commerce market in 2020

From the supply side, China has vigorously developed technology in recent years, encouraged scientific and technological innovation, product innovation, invested a large amount of capital to promote the development of the manufacturing industry, and help product upgrading. In 2019, the number of patent applications accepted in China exceeded 4 million, with a compound growth rate of 16% in the past 10 years. China is committed to product innovation and development and increasing research and development investment. At present, China's export trade product structure has gradually changed from textile-plastic products and other labor-intensive products to personalized, branded, high-tech products and other high value-added products, providing overseas consumers with more quality and inexpensive Chinese products.

From the demand side, the demand for cross-border e-commerce market is huge. The region represented by North America and Europe is the largest destination for China's cross-border exports. Although its e-commerce transactions grow relatively slowly compared with China's exports to China, its perfect supporting facilities and large market groups have still become the destinations for cross-border exports of many countries. In 2020, online retail sales in North America accounted for 19.1% of the global market and 62.6% in the Asia-Pacific region. Although the Asia-Pacific region accounted for the highest proportion, China's dominant role played a huge role. Therefore, from the perspective of China as an exporter, North America has a large number of netizens, strong consumption power, and the B2C market is more active, which is still a high-quality mature market. In addition, with the rapid development of technology, intelligent robots, intelligent electronic devices, VR and other products loved by consumers are also constantly updated, breeding new market demand, promoting the development of cross-border e-commerce product structure, and providing a new direction for the supply side. Therefore, cross-border e-commerce has also become a new channel to promote the transformation and upgrading of domestic manufacturing industry and domestic brands to go overseas.



**Figure 4.** Penetration rate of China's cross-border e-commerce industry in 2020

## 2.2. Analysis of the Current Situation of Talent Demand in the Cross-border E-commerce Industry

### 2.2.1. "Joy" of the Current Demand Situation of Cross-border E-commerce Talents

According to the forecast of China's population growth trend, the total amount of China's school-age labor force will usher in negative growth in the future, and the employment pressure will become bigger and greater. Therefore, the education level of China's employed population will continue to improve, and the scale of high-quality talent team will continue to expand to provide talent resources for cross-border e-commerce talents. At the same time, China's online retail operation and supply chain capacity have developed rapidly, and has accumulated a large number of e-commerce talents. In 2019, there were more than 50 million e-commerce employees nationwide and 9 million stores on key network platforms. The development of domestic e-commerce provides a large number of experienced e-commerce talents for cross-border e-commerce, making cross-border e-commerce enterprises have a talent advantage in

the global market competition. In addition, since 2005, the increasing number of graduate students in China has also provided rich compound talent resources for the cross-border e-commerce industry.

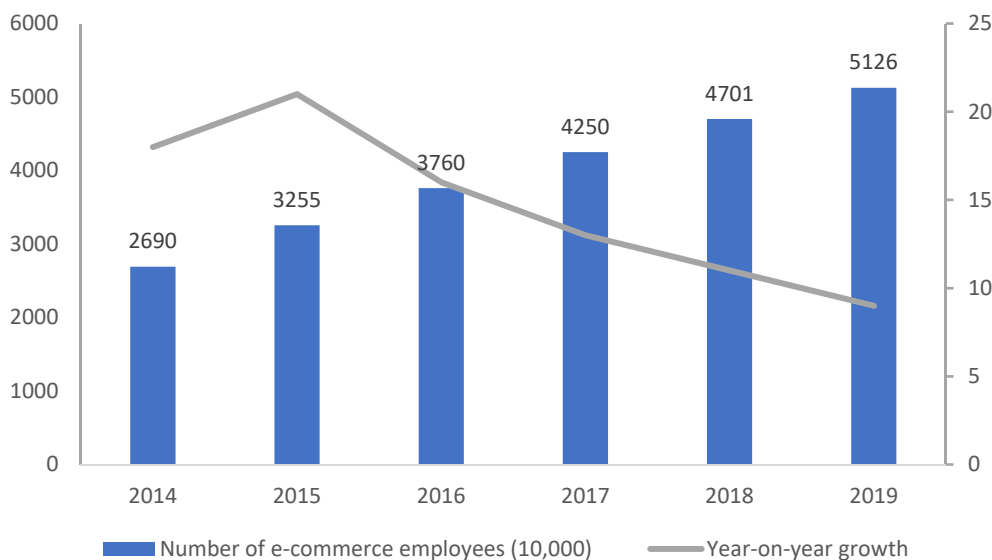


Figure 5. The number of e-commerce growth of e-commerce in China

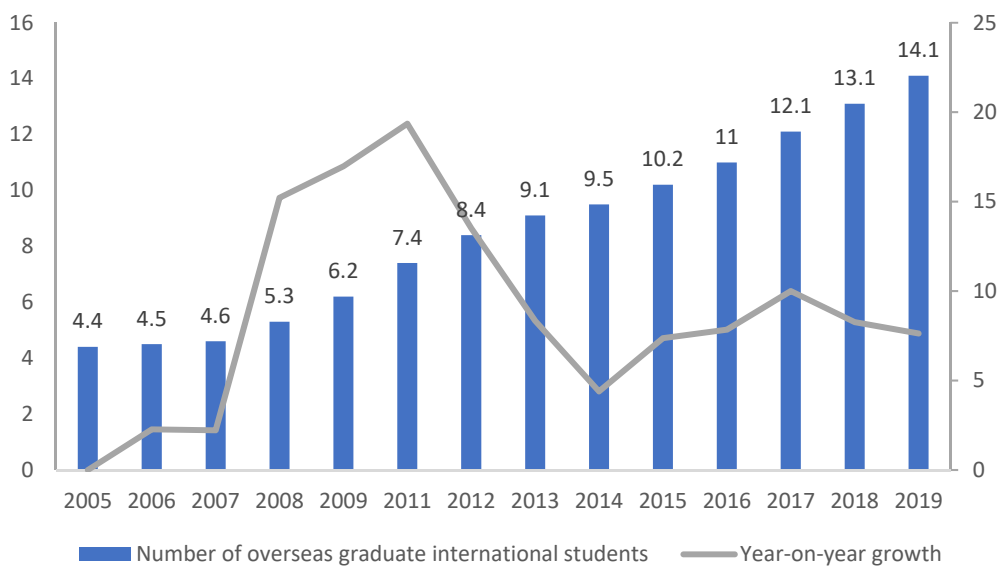


Figure 6. Number of Chinese students from 2005 to 2019

### 2.2.2. The "Worry" of the Current Demand for Cross-border E-commerce Talents

With the in-depth development of cross-border e-commerce, the contradiction between supply and demand of talents in cross-border e-commerce is prominent, which is mainly manifested in the following two aspects. On the one hand, the growth rate of talent does not match the development speed of the industry. The industry develops at a fast speed, and the cycle of training talents with cross-border e-commerce skills is long. Therefore, the number of talents growing cannot meet the development needs of the cross-border e-commerce industry. According to statistics, in 2020, China's cross-border e-commerce talent gap reached 5.8 million, and expanded with an annual growth rate of 30%. On the other hand, high-quality talents are lacking. Because cross-border e-commerce is the combination of foreign trade and e-

commerce industry, it is mainly facing the global customers, the whole process involves different languages, different countries life customs and payment, logistics, laws and regulations knowledge, very complex, so cross-border electric commerce industry needs to have international vision, strategic mind and compound high quality talents. The survey results showed that 29 percent of companies said their needs were less matched with the output of talents from universities, and 75 percent said they lacked suitable e-commerce talents. The superposition of talent quantity and quality problems has become an important factor restricting the development of China's cross-border e-commerce.

### **3. The Course of the International Trade Skills Competition and Its Significance of Talent Mining**

#### **3.1. Course of the International Trade Skills Competition**

##### **3.1.1. Introduction of the Competition**

The International Trade Skills Competition is called Anhui College Students International Trade Comprehensive Skills Competition. Its purpose aims to innovate the training mechanism of international economic and trade professionals, improve students' comprehensive quality and professional skills, improve their work and practical ability, and provide conditions for the training of excellent talents in international trade. For the COVID-19 epidemic and its future development, the competition focuses on digital trade operation skills.

##### **3.1.2. Competition System**

The International Trade Skills Competition has two parts of the school competition and the provincial competition. Participants need to first pass the school competition selection to enter the provincial race. There are three tracks in the provincial competition, and the participating teams can choose one track to enter the provincial race.

###### **School competition mechanism**

International trade knowledge competition, knowledge competition is participated by individual players, mainly investigate international trade practice, digital trade, cross-border e-commerce and a small amount of international trade theory knowledge, through the knowledge competition can participate in the follow-up competition.

The Digital Trade B2B Practical Operation Knowledge Competition, taking the completion quality of the main practical activities of the B2B platform as the competition content and evaluation standard, comprehensively examines the communication, practice and cooperation ability of the contestants. The competition requires a team competition.

The digital trade B2C practical operation skills platform evaluates the comprehensive skills of cross-border e-commerce B2C of the participating teams from the aspects of cross-border e-commerce platform registration, commodity procurement, picture collection, product release, marketing and promotion, logistics setting, order processing, statistical statements, etc. The competition requires a team competition.

###### **Provincial competition mechanism**

International trade new product press conference: The press conference is conducted in pure English, requiring the introduction and presentation of the products.

Cross-border e-commerce network broadcast: The live broadcast competition is conducted in pure English, assessing the whole process of live broadcast products, director, anchors, operation, data analysis, focusing on English level, mining of product selling points, display skills of commodity characteristics, and team assistance and cooperation ability, etc.

Cross-border e-commerce big data operation and maintenance analysis: take the real stores of cross-border e-commerce as the analysis object, on the basis of collecting big data on the platform, look for market opportunities, and put forward the operation analysis reports on



product category strategy, price strategy, promotion strategy, logistics and payment strategy, after-sales strategy and other aspects.

**Table 1.** Contents and ability assessment of B2B and B2C Practical Operation Skills Competition

project	competition contents	Assessment ability
<b>Digital trade B 2B Practical operation skills competition module</b>	<ol style="list-style-type: none"> <li>1. Promotion of cross-border e-commerce platforms</li> <li>2. Consultation on import and export transactions</li> <li>3. Import and export business cost accounting</li> <li>4. Preparation, examination and performance of import and export contracts</li> <li>5. Business communication</li> </ol>	<ol style="list-style-type: none"> <li>1. Promotion ability of cross-border e-commerce platform</li> <li>2. Business communication and consultation capacity of business for import and export business</li> <li>3. Practice and application ability of import and export business</li> <li>4. Cross-border e-commerce marketing capabilities</li> <li>5. Customer service and after-sales capability</li> </ol>
<b>Digital trade B 2C practical operation skills competition module</b>	<ol style="list-style-type: none"> <li>1. Procurement and warehouse management</li> <li>2. Photo collection, product publication, and release</li> <li>3. Product marketing and promotion and logistics setting</li> <li>4. Order processing and multidimensional reports</li> </ol>	<ol style="list-style-type: none"> <li>1. Platform product promotion ability</li> <li>2. Price accounting ability</li> <li>3. The mining and analysis ability of the data</li> <li>4. Order processing capability</li> <li>5. Customer service and after-sales capability</li> </ol>

### 3.2. Significance of Talent Mining

The International Trade Skills Competition provides a practical operation platform and practical experience for college students, so that more professional related students can master and understand the international trade-related work knowledge in advance, deepen their understanding of foreign trade and arouse their interest. It has certain practical significance in talent mining and caters to the development trend of international trade.

The International Trade Competition meets the requirements of various parties in talent mining, including the development of the world situation, national policy support, enterprise development needs and talent self-construction needs, which is of great significance.

#### 3.2.1. The Need for the International Development Situation

The current world economy and trade is affected by the "COVID-19" outbreak, the traditional form of international trade, more and more engaged in traditional international trade industry in cross-border e-commerce industry, countries never stop "opening to the outside world", international trade cooperation continues to carry out, but more in the form of electricity, electricity become the focus of international trade.

Competition based on the above situation, the cross-border electricity as the key content of the competition, through the form of competition to integrate foreign trade knowledge, and the traditional foreign trade teaching and competition, eliminate the outdated foreign trade knowledge, focus on the new knowledge of e-commerce, provide platform to use foreign trade knowledge to practice, can deepen the understanding and application of international trade knowledge, so as to conform to the development of The Times.

### 3.2.2. Response to National Policies

Since the eighteenth congress, the CPC Central Committee of the power to speed up the construction of talent in a more prominent position, implement the strategy of innovation-driven development, must take the talent development as a strategic basis point, promote the "human dividend", with "talent dividend" to seize the strategic commanding heights of future development, visible talent in today's society and the importance of national development. The platform provided by the International Trade Skills Competition provides good objective conditions for talent development, brings more professional talents to the field of cross-border e-commerce, and makes certain contributions to the exploration of talents.

Under the background of strong industry demand and huge talent gap in the field of cross-border e-commerce, the competition responds to the national policy requirements, and focuses on cultivating new talents, so that the participants can combine knowledge with practice, improve the quality of talent training, promote innovative thinking, and cultivate innovative talents.

### 3.2.3. Enterprise Development Needs

Strengthening the construction of talent team is the inevitable requirement of implementing the strategy of talent development and enterprise. In order to achieve development and progress, enterprises should vigorously implement the talent training strategy, and strive to improve the quality of workers and professional technology of workers. Talent mining and training in the competition is conducive to the construction of talent team by enterprises.

Innovation competition in the form of the students' innovative spirit, in the process of competition such as live track focus on mining of product highlights, etc., promote their thinking about innovation, improve the quality of innovative talents, through the competition platform can learn and understand the enterprise work and process, competition form innovation has played a positive role in talent training.

Enterprise demand for talent, however, the students absorb theoretical knowledge, lack of practical experience, lead to professional students ability and enterprise demand talent, and international trade competition provides participants with certain practical experience, competition is conducive to the school talent output and enterprise demand docking, do real training and mining talent.

### 3.2.4. Talent Self-construction Needs

Competition based on the enterprise job demand, let the participants in advance of each link and process, and open a new live track, required in team form, to some extent also strengthen the ability of communication and negotiation, and cause participants' attention to language learning, make more people understand the cross-border electricity field needed professional knowledge and talent should have professional quality, is conducive to the development of professional talents.

In addition, the competition encourages group competition and cross-professional teams. The cross-border e-commerce field that the competition focuses on integrates the knowledge of e-commerce and international trade, effectively expands the scope of participants' vision, stimulates the team and personal potential, cultivates team spirit and cooperation ability, and promotes the improvement of personal quality.

## 4. Construction Strategy and Application of Talent Database

### 4.1. Database Platform Selection: Access

In the unified division of industry databases, they are mainly divided into relational databases and non-relational databases. Mainstream relational databases include Oracle, DB2, Microsoft SQL Server, Microsoft Access, MySQL, and mainstream non-relational databases include



Cloudant, MongoDB, Redis and HBase. Due to the high cost of learning and use of non-relational databases, common databases are mainly relational databases in commercial and teaching activities and relational databases. Relational database has many advantages: relational model is mainly two-dimensional table structure, easy to understand; general SQL language provides complex query requirements and convenient operation; rich integrity (entity integrity, reference integrity and user definition integrity) greatly reduces the probability of data redundancy and data inconsistency, and is easy to maintain.

For talent data system, under the existing software and hardware resources, data volume is small and change frequency, to meet the friendly interface, convenient operation, simple storage, support extensive, elastic expansion, reduce data redundancy, reduce error rate, choose Access database, to implement talent data, international skills competition excellent potential player information record in the library, accurate match suitable jobs, in the school-enterprise cooperation environment, for cross-border electricity industry input fresh blood, help promote the development of new electricity industry.

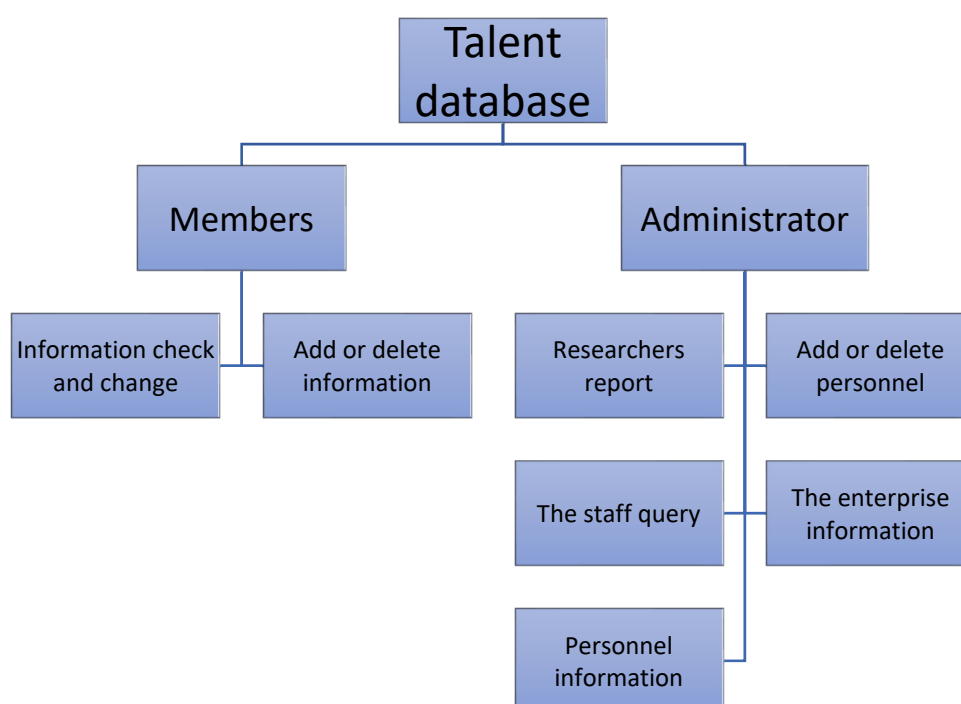
## 4.2. Database Design

### 4.2.1. Functional Module

The main functions of the talent database designed based on the Access database can be summarized as follows:

Login can choose to log in to the talent database as an administrator or member. The member account and password are sealed in the personnel information table. The account and password of members in the table are unique set points, and different.

After logging in the database, the administrator can perform multiple database operations through the system navigation. The manager enters "personnel information" to view the personal information of all winning students stored in the database, enterprise information and update, modification, increase and delete of all members; personnel report " to export or print personnel report information and return the exit system to the initial login interface. After members log in the database, they will directly view all their personal information, independently add, delete and check their personal information.

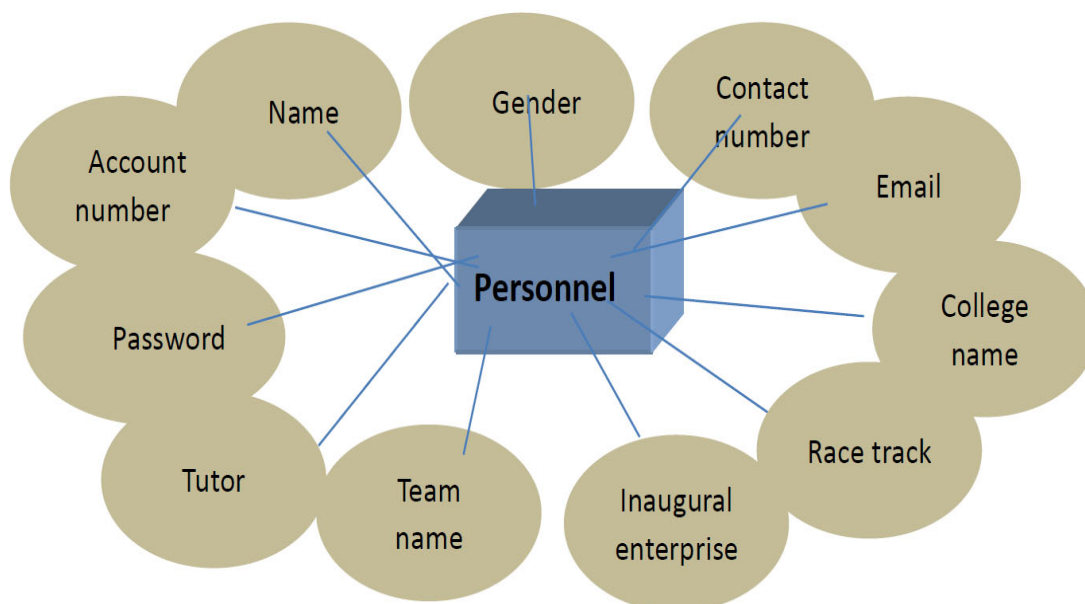


**Figure 7.** Functional module diagram

In order to get close to the competition process of the International Trade Skills Competition, in addition to the members input in the database and the basic information such as account number, password, gender, contact number, e-mail address, the winners will record their track selection, school score, total score, college name, instructor, etc., and comprehensively cover the competition information of the members. For members of the enterprise and job tracking, from BOSS or electricity industry recruitment information, from the company profile from the company website, from school-enterprise communication platform, the members of the electricity industry into administrative management (responsible for communication with the local government), marketing (responsible for product promotion), logistics (responsible for cooperation with logistics companies and customs), after-sales service (responsible for after-sales service), technical maintenance (responsible for platform maintenance and technical support), to form a systematic and professional cross-border electricity business talent data integration input. Comprehensive member information will be conducive to realizing the efficient matching of cross-border e-commerce talents and enterprise positions, observe the overall employment and development status of members, optimize the International Trade Skills competition competition, and cultivate and tap more potential and talented e-commerce talents.

#### 4.2.2. Concept Structure Design

On the basis of the functional module division developed by the talent database, the user needs are abstracted into a conceptual model. In order to find the connection between things and things, the entity-connection method is selected, that is, E-R diagram.



**Figure 8.** Personnel Information E-R Fig

The basic information of the excellent members of the International Trade Skills Competition and the enterprise school recruitment information of the International Trade Skills Competition will be checked and updated by the administrator from time to time. The talent database focuses on individual employment and enterprise positions. The precise matching of the two will give certain reference significance for the follow-up development of the cross-border e-commerce industry.

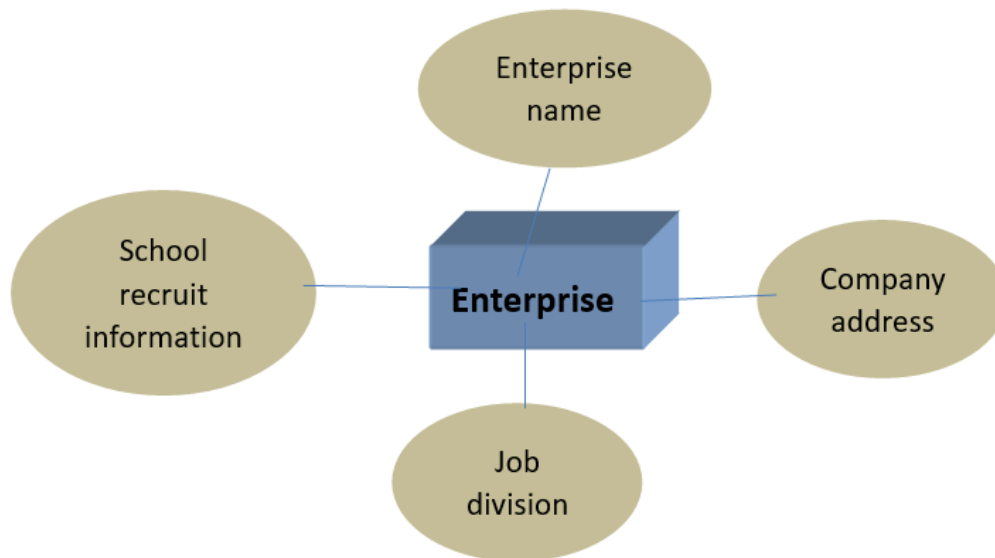


Figure 9. Enterprise Information E-R Fig

### 4.3. Database Application

Students participating in the International Trade Skills Competition have strong information outreach and availability, and the implied staggered relationship between the data volume. In order to maintain the organization and effectiveness of the information environment, the access database can maintain stable data content, which can realize many people to edit data online at the same time, and meet the demands of a small-range of internal business development.

The collection of talent information adopts access database rather than Excel, which takes into account the data storage capacity and format, data cleaning and processing difficulty, and data query and sharing functions. The application of talent database is reflected in the preservation, query, update and maintenance of member information.

The increase, modification of personnel information, delete and query based on access database macro code operation and button collocation, talent database can directly extract or locate to specific personnel account to avoid in the individual information data format, data error phenomenon, greatly simplify the processing process from the whole.

Talent database frame form, form, report, query four components, member information, enterprise information display and application with front-end development function, the software writing time is shortened, view interface indirect and beautiful, system logic layout change can choose macro, VBA or expression generation, suitable for different preferences administrator operation.

### 4.4. Value Embodiment

Carefully analyzing the process design of the International Trade Skills Competition, the professional knowledge of international trade and digital trade skills are tested and demonstrated by maximizing the quality and ability of e-commerce merchants. The talents selected by the competition are of great significance to the talent recruitment of e-commerce enterprises. By international trade skills competition selected qualified electricity talent, many electricity talent information login in the library, track electricity talent career development, according to the electricity industry market demand focus on school-enterprise training, in order to adapt to the changing electricity environment and development, thanks to better contact the cross-border electricity industry market situation, rich optimization competition theory practical significance, for the industry reserve excellent cross-border electricity talent.

## Acknowledgments

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