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Research on the Configuration Effect of Electronic Sports Industry in Urban Development

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Abstract: *Based on the theory of industry city people and the perspective of configuration, an analytical framework of "industry support city function human orientation" was constructed. Under this framework, five conditional variables were selected: industrial structure, economic function, social function, population quality, and population structure. The top ten cities with good development momentum in China's e-sports industry were selected as the analysis samples, and the fuzzy set qualitative comparative analysis method was used to explore the combined factors that affect the development of the e-sports industry in cities. The results showed that "industrial structure" is an indispensable condition for the development of the electronic sports industry in cities, while "economic function," "social function," "population quality," and "population structure" are not necessary conditions for constituting outcome variables. This indicates that the development of the e-sports industry in a city is the result of multiple intertwined factors, rather than a single factor playing a significant role. Research has found that there are three paths that can positively affect the development of the e-sports industry in cities, condensed into a dual wheel drive of industrial structure and economic function, a tripartite drive of industrial structure, social function, and population quality, and a co drive of industrial support and humanistic orientation. From the perspective of configuration, industrial structure, economic composition, and population quality are key conditions that affect the development of the e-sports industry in cities. The research conclusion indicates that to enhance the development of urban e-sports cities, it is necessary to reasonably layout the industrial structure, improve the level of urban economic development, and strengthen the comprehensive level of human capital.*

Keywords: *electronic sports industry, the theory of urban residents, urban development, configuration effect, fsQCA*

1. Introduction

Following the timeline, from electronic sports being listed as the 99th official sport by the General Administration of Sport of China (later raised to 78th), to the International Olympic Committee announcing the inclusion of electronic sports as a "sports activity", and then to electronic sports being listed as a performance event at the Jakarta Asian Games and approved as a competition event at the Hangzhou Asian Games, the International Olympic Committee announced the establishment of the International Olympic Committee's Electronic Sports Commission. Along the way, the status of electronic sports has gradually improved and continued to be highlighted. Electronic sports are an integral part of sports, and the electronic sports industry is constantly unleashing its enormous development potential. Shanghai, Chengdu, Suzhou, Hangzhou and other cities have laid out the development of the e-sports industry, aiming at the momentum of the e-sports industry. They have successively held e-sports events, aiming to build cities into international e-sports cities. The goal is to stimulate consumption and activate sluggish markets through e-sports, drive urban development, and showcase the city's business card. The development of the electronic sports industry not only drives the development of the sports industry, but also plays a positive role in activating urban vitality and driving urban economic growth.

There is a natural interactive relationship between industry and city. To improve the quality of urban development, it is particularly important to pay attention to the supporting position, driving function, and guarantee role of industrial development in promoting urban development. Promoting the integration of the two is not only beneficial for expanding the space for industrial development, but also for cultivating the driving mechanism of urban development.

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The development of the electronic sports industry cannot be separated from cities. Cities are the carriers of industrial development, and the core of industry and city is people, who are the intermediate medium between urban and industrial development. The e-sports industry brings cultural, economic, and social opportunities to cities, while cities also provide infrastructure, investment, and talent for the e-sports industry, jointly promoting the development of the e-sports industry and the prosperity of cities. However, the development of the electronic sports industry is not solely driven by a single factor, but rather by multiple intertwined factors that collectively influence the industry. Therefore, this article takes the theory of industry city people as the analytical framework, and from the perspective of this theory, starting from the three aspects of industry, city, and population, explains the conditions required for the development of the electronic sports industry in cities, and explores the causal relationship that affects the development effect of the electronic sports industry.

2. Literature review

The integration of industry and city refers to the coordinated development of industries and cities. The development concept of "integration of industry and city" is proposed by the country in the process of "innovation" and "transformation" to enhance the carrying capacity of cities for industries. Industry is the foundation of urban development, and cities are the carriers of industrial development. From the perspective of integration form and development process, the integration of industry and city people is a more advanced stage of industry city integration.

The theory of industry city people, as the name suggests, includes three subsystems - industry, city, and people. From the perspective of the theory of industry city people, the three subsystems of industry, city, and population do not develop in isolation, but evolve dynamically through precise coordination under certain conditions. The upgrading of "production" brings about the gathering of "people", which in turn triggers the improvement of "city", and the three subsystems work together. The basic logic of the integration of industry, city, and people is that the integration of industry and people is the foundation, that is, the development of industries requires labor as the basic element, and the survival and development of workers need to be achieved through the employment provided by industries; The integration of industry and city is key, that is, urban development requires industries to provide production power, while industrial development requires cities to provide spatial carriers; The integration of urban residents is the destination, that is, population is the vitality of urban development, and cities should provide suitable working and living environments for the population. The integration of industry, city, and people means that "industry" can unleash stronger development potential, "city" can provide better development space, and "people" can obtain higher-level needs. The theory of "industry city people" defines a new urban development model that integrates industry, city, and people. It is based on the city, guaranteed by industry, and aims to improve people's quality of life. Through industrial upgrading and urban service matching, it achieves the matching of industrial structure, employment structure, and consumption structure, and realizes the integrated development of industry, city, and people [1].

Existing research has quantitatively analyzed the integration of industry and city. Cong et al. [2] believe that there are few indicators in the previous indicator system that combine industry, city, and population to characterize the development status of industry city integration. Therefore, based on a review of a large number of relevant literature, an evaluation index system for industry city integration has been constructed with three primary indicators: industry support, urbanization construction, and population aggregation. Guided by the principles of operability, comprehensiveness, and scientificity, Zhang et al. [3] constructed an evaluation index system for the integration of industry and city from three perspectives: humanistic orientation, functional integration, and spatial integration.

This article uses the theory of industry city people to discuss the factors that affect the development of the e-sports industry in cities from this analytical perspective. And it is believed that cities are the soil for the development of the e-sports industry, and talent is the driving force for the development of the e-sports industry. The e-sports industry is an emerging industry, and cities can create employment opportunities, attract capital and innovation, and promote urban economic development by introducing the e-sports industry. Meanwhile, the infrastructure, cultural atmosphere, and policy environment of cities are crucial for the development of the e-sports industry. Cities need to provide e-sports venues, network facilities, and entertainment facilities to host e-sports competitions and attract e-sports enthusiasts. The development of various industries cannot be separated from "people", and the e-sports industry is no exception. The e-sports industry requires various professional talents, including e-sports players, coaches, commentators, game developers, etc. Therefore, under the theory of industry city

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people, it is possible to analyze more clearly the factors that affect the development of the e-sports industry in cities.

The electronic sports industry symbolizes the arrival of the digital age of sports, and sports digitalization will promote the innovative development of the sports industry [4]. The e-sports industry is a product of the integration of the information industry and the sports industry [5]. After years of development, e-sports has formed a relatively complete industry chain, including content production [6], e-sports players, game manufacturers, event operation, and video live streaming [7].

However, currently, the development of the e-sports industry is facing the following problems: lack of government documents and regulations, misinterpretation of the e-sports industry by mainstream social consciousness, a series of problems in the operation of e-sports clubs, and low standardization of e-sports events [8]. At the same time, the e-sports industry has a single profit model, weak independent research and development capabilities, and the alienation of mainstream media promotion, which are also worth paying attention to [9].

In order to explore the development path of the e-sports industry, Ma et al. [10] conducted a quantitative analysis of the geographical agglomeration characteristics and influencing factors of China's e-sports industry. The study showed that economic level, industrial structure, human resources, government policies, innovation environment, economic extraversion, and user scale are the main factors affecting the agglomeration of the e-sports industry. Ning et al. [11] believe that there are many global cities developing the e-sports industry, but the development effects vary significantly. Therefore, using the expert consensus meeting method, they have constructed a global e-sports capital evaluation system consisting of five primary indicators: "industrial ecology", "infrastructure", "events", "clubs", and "social influence", in order to identify important factors that affect the e-sports industry.

For a city, e-sports is an emerging industry under the wave of the Internet economy and digital industry, which has great potential to promote the transformation and upgrading of urban industries and enhance urban competitiveness. Through the "e-sports+" model, it connects with other industries with strong consumption power in the city, and achieves cross-border integration and deep integration, which not only helps the development of the e-sports industry itself, but also provides new impetus for the development of other industries in the city [12].

Since Shanghai proposed the construction of the "Global E-sports Capital" in 2017, relevant policies have been successively introduced to create and optimize the development environment of the e-sports industry. Other large cities are not willing to fall behind and have successively introduced policies for the e-sports industry and introduced e-sports events. For cities, e-sports is the "nerve endings" of future urban infrastructure and the "soft power" of urban culture, providing a rare opportunity for urban development [13]. E-sports, as an industry dominated by young people, will become a driving force for future urban development through the gathering of young people [14]. The electronic sports industry can not only lead the overall development of urban economy, but also drive the development of other industries and have a positive effect on local social cohesion [15]. In addition, the development of the e-sports industry can promote the optimization and upgrading of industrial structure, enhance urban attention and exposure, highlight urban youthfulness, promote the landing of technological scenes, create and highlight urban image, and bear the responsibility of cultural dissemination [16].

Under the theory of industry city people, based on previous research, this article draws on the industry city integration index system constructed by Cong et al. [2], the e-sports industry influencing factor index system constructed by Ma et al. [10], as well as the reality and influencing factors in the development of the e-sports industry. Using the fuzzy set qualitative comparative analysis method, conditional variables are selected from three aspects: industrial support, urban function, and humanistic orientation to study the top ten e-sports cities in China, and analyze the combined effects of multiple combined influencing factors in the process of urban development of the e-sports industry.

3. Research methods and data sources

3.1 Research methods

Using fuzzy set qualitative comparative analysis, namely fsQCA. The QCA method is based on set theory and Boolean algebra, using configuration logic to study the effects of multiple complex variable combinations on the outcome variables.

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This article adopts fsQCA analysis mainly considering the following reasons: on the one hand, China's electronic sports industry is still in the initial stage of development, and there are not many cities that are actually developing the electronic sports industry. The cities at the forefront of development are mainly those with certain urban scale, economic strength, and population. Based on the 2020 National E-sports City Development Index Evaluation Report, the top 10 e-sports cities in the report were selected as case samples, belonging to the category of small and medium-sized samples. On the other hand, traditional linear regression can only analyze the impact of a single variable, while fsQCA can identify the combination relationship between multiple factors and analyze the effects of multiple factors on the outcome variable.

3.2 Variable selection

Configuration analysis mainly studies the synergistic effects and interdependence relationships between conditional variables, so the selection of outcome variables and conditional variables is an important step in QCA analysis. This article studies the influencing factors of urban development of the e-sports industry. Therefore, the outcome variable is the effect of e-sports city development, and the selection of conditional variables revolves around the theory of industry city people.

3.2.1 Result variables

As an industry with great growth potential, the development of the e-sports industry in cities aims to improve the industrial structure on one hand, and on the other hand, to drive the economy and consumer demand through the development of the e-sports industry, thereby increasing market activity. The degree of urban development of the e-sports industry is measured by the E-sports City Development Index. Using the 2020 China E-sports City Development Index as the outcome variable, the larger the value, the better the development of the e-sports industry in the city.

3.2.2 Conditional variables

Although the QCA method can analyze multiple conditional configurations, in practical operation, considering that not all possibilities can be fully explored, suitable conditional variables that conform to the development laws of the e-sports industry are selected from three dimensions.

Through literature review and considering the limited sample size, five dimensions of industrial structure, economic function, social function, population quality, and population structure are selected as conditional variables from the perspective of the theory of urban production.

(1) Industrial structure. Industrial support is the foundation of the integration of industry and city. By optimizing the structure of the three industries, promoting the upgrading of industrial levels, deepening industrial connotations, and strengthening the support and leading role of industries in urban development, it is the driving force and cornerstone of urban construction[18-19]. Industrial structure is used to measure the composition of various industrial sectors or within each industrial sector of the national economy. The e-sports industry belongs to the tertiary industry, but it affects many other service industries. Therefore, we choose to measure it using the proportion of the tertiary industry's output value to GDP.

(2) Economic function. Cities with high per capita GDP usually have more advantages in supporting and developing the e-sports industry. More resources and markets can attract more investment and cooperation opportunities, while also having higher consumption power to support the development of the e-sports industry. Therefore, the per capita GDP level is chosen to express the level of economic function.

(3) Social function. Internet and other infrastructure is the key to the development of e-sports. This paper selects the number of mobile Internet users to measure the level of social function. The more mobile Internet users, the better the city's Internet infrastructure.

(4) Population quality. Electronic sports are a part of competitive sports and also require senior management personnel. Many domestic universities offer e-sports related courses to cultivate e-sports professionals, therefore, the number of students in regular higher education institutions is used to evaluate the quality of the population.

(5) Population structure. Electronic sports cannot do without the internet. Whether it is the upstream development end of the e-sports industry chain, the midstream event organizers, or the downstream dissemination parties, they all need to revolve around computers, and select the number of information transmission, computer services, and software industry practitioners to measure population structure.

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3.3 Data sources

This article selects 10 cities in China with good development momentum in the current e-sports industry from the "2020 National E-sports City Development Index Evaluation Report" - Shanghai, Beijing, Guangzhou, Chengdu, Shenzhen, Hangzhou, Nanjing, Chongqing, Xi'an, and Suzhou. The index data for urban development of e-sports industry comes from this report. Specifically, regarding the conditional variables, the data for all five conditional variables are sourced from the 2020 Statistical Yearbook of the region compiled by various provincial and municipal statistical bureaus in 2021. Among them, the missing data for information transmission, computer services, and software practitioners in Chengdu in 2020 is filled in with data from the 2020 "China Urban Statistical Yearbook".

3.4 Data calibration

This article adopts the direct calibration method, setting the 95% quantile, 50% quantile, and 5% quantile as calibration anchors, representing complete membership, intersection, and complete non membership, respectively. The specific calibration results are shown in the Table 1.

Table 1: Variable calibration

Variable name		Calibration		
		Fully subordinate	Intersection	Completely not affiliated
Result variable	E-sports city development index	75.19	62.15	57.655
Conditional variable	The proportion of output value of the tertiary industry to GDP	78.985	64.68	52.635
	Per capita GDP level	16.238	14.94	7.865
	Number of mobile Internet users	1549.5835	627.34	508.832
	Number of students enrolled in regular higher education institutions	116.832	75.42	19.335
	Number of employees in the information transmission, computer services, and software industries	108.981	26.91	13.657

4. Data analysis and empirical results

4.1 Necessity analysis

The necessity test is an important step of the fsQCA method, used to check whether the results are dependent on a certain conditional variable. The inspection process includes two indicators: consistency and coverage [20]. Consistency refers to the degree of consistency between sample testing and set relationships. The criterion for necessary condition analysis is that if the consistency level is above 0.9, then the conditional variable can be considered a necessary condition for the outcome variable. Coverage is an important indicator for measuring the correlation between necessary conditions and experience. Meanwhile, the coverage score of necessary conditions is usually high, and it is rare for it to be much lower than 0.5 [21]. Using fsQCA software to perform necessary condition analysis on calibrated individual variables, the specific analysis results are shown in the table below. The results showed that the consistency of "industrial structure" was greater than 0.9, and the coverage was also greater than 0.5, indicating that the variable of industrial structure has strong explanatory power for the results and is an indispensable condition for the development of the electronic sports industry in cities. The consistency of the four conditional variables, namely "economic function," "social function," "population quality," and "population structure," is less than 0.9, indicating that they can explain the outcome variables to a certain extent, but they are not necessary conditions for constituting the outcome variables. This also indicates that the development of the e-sports industry in a city is the result of multiple intertwined factors, rather than a single factor playing a significant role. As is shown in Table 2.

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Table 2: Analysis of necessary conditions

Conditional variable	Development of high-level e-sports cities		Development of non high level e-sports cities	
	Uniformity	Coverage	Uniformity	Coverage
Industrial structure	0.900429	0.823643	0.492421	0.503876
~ Industrial structure	0.457630	0.446281	0.827647	0.902893
Economic function	0.718225	0.630112	0.560603	0.550186
~ Economic function	0.487291	0.497835	0.623103	0.712121
Social function	0.514834	0.546067	0.583330	0.692135
~ Social function	0.709750	0.603603	0.617421	0.587387
Population quality	0.586868	0.548515	0.647724	0.677228
~ Population quality	0.654665	0.624242	0.568179	0.606061
Population structure	0.879243	0.830000	0.429922	0.454000
~ Population structure	0.421613	0.398000	0.839011	0.886000

4.2 Sufficient analysis of conditional configuration

The sufficiency analysis of conditional configuration is the core of QCA method, which aims to analyze the sufficiency of configurations formed by different antecedent conditions on the results [22]. According to Boolean simplification and logical relationship rules, fsQCA conducts sufficient analysis of multiple factors in multiple cases to identify several configurations of outcome variables. Based on the process of constructing a truth table in this article and referring to Du et al. [17], the consistency threshold is set to 0.8, the PRI threshold is selected to 0.75, and the frequency threshold is set to 1. Boolean algebraic operations are performed to obtain complex solutions, intermediate solutions, and simple solutions. Intermediate solutions that are reasonable, well founded, moderately complex, and do not allow for the elimination of necessary conditions are considered the preferred choice for reporting and interpretation in QCA research [23]. The configuration results are shown in Table 3.

Table 3: Grouping results of influencing cities to develop the e-sports industry

Classification	Configuration 1	Configuration 2	Configuration 3
Industrial structure	●	●	●
Economic function	●	⊗	⊗
Social function	●	●	⊗
Population quality	⊗	●	●
Population structure	●	⊗	●
Uniformity	0.972656	0.984	0.976048
Coverage	0.527546	0.260595	0.345341
Unique coverage	0.358053	0.0360171	0.0805089
Overall consistency	0.964674		
Overall coverage	0.752123		

Note: ● represents the existence of the core, ⊗ represent the existence and absence of edges, and blank space indicates the existence and absence of this condition.

Through QCA configuration analysis of the top ten electronic sports cities in China, it was found that the overall consistency of the solution was 0.965, which is higher than the consistency threshold of 0.85; The overall coverage of the solution is 0.752, indicating that these three configurations explain more than 75.2% of the reasons affecting the development of the electronic sports industry in cities. Therefore, these three configurations can be regarded as a comprehensive combination of the basic conditions that urban development of the e-sports industry should possess.

By comparing three configuration condition variables, three paths that affect the development of the e-sports industry in cities can be summarized. The coverage of the three paths is 0.528, 0.261, and 0.345, indicating that the case samples explained by Configuration 1, Configuration 2, and Configuration 3 account for 52.8%, 26.1%, and 34.5% of the total cases, respectively. The unique coverage of Configuration 1 is much higher than that of Configuration 2 and Configuration 3, indicating that Configuration 1 is more likely to be a condition for the development of the e-sports industry in cities.

(1) Dual wheel drive of industrial structure and economic function. In configuration 1, high industrial structure and high economic function are the core conditions, while high population structure

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and non high population quality are the marginal conditions that can help cities develop the e-sports industry. In this configuration, typical cases are Shanghai and Beijing, where the proportion of tertiary industry output value and per capita GDP level are relatively high. In 2018, the proportion of tertiary industry output value in Shanghai's GDP was 73.1%, with a per capita GDP of 155800 yuan, while in Beijing, the proportion of tertiary industry was 83.8%, with a per capita GDP of 164900 yuan.

On the one hand, the higher the level of economic development, the more conducive it is to the development of the electronic sports industry in cities. The per capita GDP of Beijing and Shanghai exceeds 150000 yuan, ranking among the top in the country. High per capita GDP indicates that residents in the region have higher consumption capacity and the ability to support the demand for e-sports related products and services, thereby driving the development of the e-sports industry and the urban economy. At the same time, a high average GDP per capita means that the city has relatively abundant industrial resources. The development of the electronic sports industry is usually intertwined with multiple industries, with a high degree of inter industry correlation. The facilities and resources such as e-sports venues, network infrastructure, event organization and dissemination are relatively complete, which is conducive to the development of the e-sports industry. In addition, high per capita GDP can attract and retain e-sports related talents, and the gathering of professional talents can not only drive the development of industries, but also enhance the influence of cities.

On the other hand, the proportion of the tertiary industry reflects to some extent the changes in industrial structure. The higher the proportion of the tertiary industry, the more reasonable the industrial structure and the more dynamic the economic development. The tertiary industry includes the service industry, and according to the division of China's industrial system, the sports industry and e-sports industry belong to the tertiary industry. The proportion of the tertiary industry in Beijing and Shanghai ranks among the top two in the country. In 2017, Shanghai released "50 articles of cultural innovation", which clearly put forward the goal of accelerating the construction of "the global e-sports capital". In 2019, Shanghai released "20 articles of e-sports", which pointed out the direction for the development of the e-sports industry. In 2020, although the social development was affected by the COVID-19, and the development of sports events and sports industry was hit, Shanghai issued "Several Policies and Measures to Fully Support the Prevention and Control of Epidemics of Cultural Enterprises in the City, Steady and Healthy Development", and the speed of building "the e-sports capital" has not slowed down, which also reflects the affirmation and full support of all circles in Shanghai for the development of the city's e-sports industry. At the same time, from 2017, In order to vigorously promote the development of e-sports industry and improve its status, Shanghai has successively introduced and improved relevant policies on e-sports industry, aiming to encourage the development of e-sports industry, and provide financial subsidies for events, venues, talents, and other aspects. Cities will shift some of their development focus to the e-sports industry. The help of the e-sports industry to urban development is self-evident, and its industrial status and proportion are gradually increasing. Similarly, in Beijing, in 2019, the "Several Opinions on Promoting the Healthy Development of Beijing's Gaming Industry" were issued, aiming to improve the quality and efficiency of Beijing's gaming industry and build it into the "International Online Gaming Capital". In 2020, Beijing held the "E-sports Beijing 2020" series of activities, using Beijing's market size to drive the development of the e-sports industry and promote the e-sports industry in Beijing. The mutual embedding of industrial structure and economic functions provides rich development soil for the development of the e-sports industry in cities. The combination and synergy of the two play a role, injecting a stimulant into the development of the e-sports industry in cities.

(2) The tripartite balance of industrial structure, social function, and population quality. In configuration 2, there are no conditions for the existence or absence of a core. Industrial structure, social function, and population quality are conditions for marginal existence, while economic function and population structure are conditions for marginal absence. In this configuration, typical representatives are Chongqing and Chengdu. In 2020, the proportion of the output value of the tertiary industry in these two cities will be above the middle level. The number of Internet broadband access users and the number of students in ordinary colleges and universities will be in the forefront of cities in China. The per capita GDP will not exceed 100000 yuan. The number of information transmission, computer services and software practitioners will only be in the middle level. This reflects that through the cooperation of industrial structure, social function and population quality, the e-sports industry will have a relatively good development under these three conditions.

(3) Industry support and humanistic orientation drive together. In configuration 3, the core existence conditions are industrial structure and population quality, the edge existence conditions are population structure, and the edge absence conditions are economic and social functions. In this configuration, it

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can be explained that 34.5% of cities can develop the e-sports industry well under these conditions, represented by Guangzhou and Shenzhen. A diversified industrial structure and high-quality population help cities attract investment, support infrastructure and talent training for the e-sports industry, while also creating greater market demand and driving the growth of the e-sports industry. Guangzhou is a pioneer in the development of the e-sports industry in domestic cities. There are many e-sports industry companies in Guangzhou, and industrial agglomeration is conducive to development. Shenzhen has many hardware manufacturing enterprises, mainly concentrated in the upstream of the e-sports industry chain, providing support for the equipment and technology of the e-sports industry.

5. Conclusion and suggestions

5.1 Conclusion

As an emerging industry, the growth potential of the electronic sports industry has attracted the attention of many cities. This article takes the top 10 electronic sports cities in China as case samples and uses the fuzzy set qualitative comparative analysis method to analyze the linkage effects and driving paths of five antecedent variables, namely industrial structure, economic function, social function, population quality, and population structure, on the development of the electronic sports industry in cities under the framework of industry city people analysis. It reveals the influencing factors of urban development of the electronic sports industry.

Firstly, overall, industry, city, and population cannot individually affect the development of the electronic sports industry in cities. There are three key paths for the development of the electronic sports industry in cities, namely the dual wheel drive of industrial structure and economic function, the tripartite drive of industrial structure, social function, and population quality, and the co drive of industrial support and humanistic orientation. These configurations cover 75.2% of the cases and can explain the antecedent combination that affects the development of the e-sports industry in cities.

Secondly, the reasons for the development of the e-sports industry in cities are multifaceted, and the factors that affect the development of the e-sports industry are diverse. These factors are intertwined and effectively combined to help the development of the e-sports industry from different perspectives. From the perspective of configuration composition, industrial structure, economic composition, and population quality are key factors affecting the development of the e-sports industry in cities. The development of the e-sports industry is often better in regions with a sound and reasonable industrial structure and a higher level of economic development; the economic development is slightly inferior, but in areas with complete industrial structure and high population quality, the development of the e-sports industry is also on par. Regardless of the configuration, the industrial structure is the core part, which also verifies that the e-sports industry chain covers a large number of service industries. The more reasonable and complete the industrial structure, the less resistance to the development of the e-sports industry.

5.2 Suggestions

Based on the above research conclusions, the following suggestions are proposed to enhance the development of the e-sports industry.

Firstly, a rational layout of the industrial structure. Cities should have a diversified industrial structure, and a reasonable layout of the industrial structure will help form a more favorable ecosystem, attracting more investment, sponsors, and enterprises to join the e-sports industry, while also providing more opportunities and resources for the development of the e-sports industry. The e-sports industry has formed a complete industrial chain, in which various business formats serve the e-sports industry. The more reasonable the industrial structure layout, the more likely resources will be invested in supporting the infrastructure and activities of the e-sports industry.

Secondly, enhance the level of urban economic development. Improving the economic level of cities can attract more funds to invest in the e-sports industry. We encourage venture capital, sponsors, and advertisers to participate in and support the development of e-sports clubs, events, and teams. Utilize the economic strength of the city to encourage the hosting of large-scale international e-sports events and enhance the city's visibility.

Thirdly, improve the comprehensive level of human capital. The supply of human capital includes both quantity and quality aspects. There is a significant shortage of e-sports professionals in China, and

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although some universities have established e-sports programs, there is a high demand for talent. Cities can support the establishment of e-sports education and training institutions, providing training and education for young people, and cultivating e-sports players, coaches, and practitioners. We will work together in terms of both quality and quantity to increase the proportion of high-quality talents in the total human capital.

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