Talent Cohesion Strategy for Building Innovation-oriented Central City against the Background of Big Data

-Take Guiyang as an Example

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Abstract—**At present, under the background of big data strategy and "innovation-driven" strategy, innovation-oriented central city has become a road which one must get through for regional centers to improve the primacy and competitiveness of cities. Guiyang is the first comprehensive big data pilot area of China.Based on its own advantages and relyinig on big data technology, Guiyang has built a major strategic layout of building an innovative central city. However, the shortage of high-tech talents such as big data talents seriously restricts the construction process of innovation-oriented central city and becomes the biggest obstacle in the process of urban construction. In view of this, based on the background of big data and combined with the present situation of talent in Guiyang, this paper puts forward the strategy of talent aggregation with a view to providing endogenous power for building an innovative central city of Guiyang and driving the innovative construction and development of the whole province.**

Keywords—*innovation-oriented central city; talent cohesion; big data; guiyang*

I. INTRODUCTION

Innovation-oriented central city, is a city development mode which see science and technology innovation as the core driving force. It is formed by regional political, economic, technological and cultural center city, powered by scientific and technological progress, high-tech industries as the support, based on innovative culture, pathed by enhance the ability of self-innovation as the path, focusing on changing the pattern of economic development as the center and in order to improve the comprehensive competitiveness of city as the goal of urban form.

Building an innovation-oriented central city, is a major strategic goal for Guiyang proposed by Guizhou provincial party committee ,who made the big decision on the basis of accurately grasping the current situation and analyzing the opportunities and challenges it faces. Undoubtedly, the realization of this goal needs the support of a large number of knowledge-based industries and high-tech industries. Because different from the manufacturing industry with "facilities first

and talents second", knowledge-based industry and high-tech industry require talents first who is necessary to do basic design. Therefore, talents should be placed in the first place in the process of building an innovative central city. However, due to factors such as geographical location and historical conditions, the supply of talents in Guiyang is seriously insufficient. And the shortage of high-tech talents such as big data talents is serious, which has become the biggest obstacle to the construction of an innovative central city in Guiyang.

II. OVERVIEW OF CURRENT SITUATION

A. Selecting a Overview Template of Big Data Development in Guiyang

According to the 13th five-year plan, China has implemented a big data strategy. In 2015, in *Action outline for promoting the development of big data* issued by China State Council, Guizhou was the only province to be mentioned. Also, it is the first comprehensive big data pilot zone of China. Based on this, Guizhou regards big data as a strategic engine for late-mover, and give a firm push to the strategic action of big data. Guiyang, as the capital city of Guizhou, has become the main position to implement big data strategy and develop big data industry. Since then, Guiyang has also put big data strategic action as the top priority of all current work.

In 2015, Guiyang seized the historic opportunity of a new round of scientific and technological revolution and industrial transformation, and began to lay out big data. In 2017, it proposed to build a "China digital valley" and upgrade the development of big data. In 2018, by issuing implementation guidelines, Guiyang identified the development of digital economy as a new engine to accelerate the transformation of old drivers and promote high-quality development. At present, taking "introduction of thousands of enterprises", "transformation of thousands of enterprises" and "integration of thousands of enterprises" as the starting point , Guiyang strengthen the deep integration of big data and real economy and promote the transformation and upgrading of traditional industries. So far, by virtue of big data, Guiyang has driven the transformation and upgrading of traditional industries

through innovation and become the only city in our country to develop big data systematically, and also becoming the benchmark for the latecomers.

However, despite the impressive results, due to the weak industrial foundation and insufficient supply of high-tech talents such as big data talents, Guiyang is facing the dilemma of insufficient late-motility in the process of developing big data.

B. Overview of Talents in Constructing an Innovation-oriented Central City

Constructing innovation-oriented central city is a major strategic guidance which is proposed by Guizhou provincial party committee to Guiyang with the accurate grasp about the current situation and analyzing opportunities and challenges. With the "east wind" sent by "big data" strategy , Guiyang has seized the corner of the excellent opportunity to overtake.

Scientific and technological innovation is the decisive factor of industrial structure upgrading and economic growth, and it is also the main support point of innovation-oriented central city construction. As the core element of scientific and technological innovation activities, the agglomeration effect of scientific and technological talents and the resulting effectiveness, can effectively enhance the regional industrial competitiveness and provide the driving force of human capital for the development of high-tech industries. Therefore, the construction of innovation-oriented central city is in urgent need of a strong team of scientific and technological talents. Specifically, if Guiyang wants to build an innovation-oriented central city by in virtue of big data strategy, recruiting a large number of high-tech talents is a must, including innovative talents, application-oriented talents, inter-disciplinary talents and comprehensive talents.

However, at present, in the process of building an innovation-oriented central city, we are faced with the dilemma of insufficient talents, low level and poor structure. To be specific, the total amount of talent team is insufficient, and talents in various fields are in shortage to varying degrees. Secondly, the talent structure does not match the real demand.

There is a severe shortage of high-level talents who can do top-level design for the construction of innovation-oriented central city, and the shortage of high-tech talents such as big data talents is serious. There are problems like this lack of talent effectiveness, lack of skills display platform, and a lot of waste of human resources. Also, the retention ability needs to be strengthened, the local brain drain phenomenon is serious, The turnover rate of R&D personnel is high, at the same time, the province talent introduction difficulty. It seriously restricts the construction process of innovation-oriented central city.

III. REASON ANALYSIS OF TALENT GAP

C. Overall Shortage of Scientific and Technological Innovation Talents in China

With the advent of knowledge economy, science, technology and innovation play an increasingly important role in promoting the economic development of a country, and scientific and technological innovation talents, as the primary factor of production, have become the leading force to promote regional economic development.·

In terms of the world, while the total number of scientific and technological innovation talents in China ranks first in the world and continues to grow, the proportion of them in employment is far lower than that of developed countries (table 1). In addition, under the strategic background of "mass entrepreneurship and innovation", the overall supply of scientific and technological innovation talents across the country is insufficient, and there is still an urgent need for a large number of scientific and technological talents with innovative quality and ability. Take big data talents as an example, according to the first big data talents report released in July 2016, there are only 460,000 big data talents in China at present, and the gap of big data talents in the next 3-5 years will be as high as 1.5 million. This means that China and the world are facing a serious big data talent gap. No wonder that Guiyang is facing a serious shortage of scientific and technological talents in the development of an innovative central city based on big data.

TABLE I RESEARCH AND DEVELOPMENT PERSONNEL TOTAL MORE THAN 100,000 COUNTRIES

	Year	R & D personnel (10000/year)	The number of R & D personnel among the 10,000 employees	R & D researcher (10000/year)	The number of R & D researcher among the 10,000 employees
China	2017	403.4	52.0	174.0	22.4
Austral	2010	14.8	133.0	10.0	90.3
Brazil	2014	37.7	30.9	18.0	14.8
Canada	2016	22.3	120.9	15.5	84.1
France	2017	43.5	155.8	28.9	103.4
Germa	2017	68.2	154.0	41.4	93.4
India	2014	52.8	7.8	28.3	4.2
Italy	2017	29.2	116.2	13.6	54.3
Japan	2017	89.1	131.9	67.6	100.1
Korea	2017	47.1	177.5	38.3	144.3
Netherl	2017	13.8	152.1	8.5	93.8
Poland	2017	12.1	74.6	9.6	59.3
Spain	2017	21.6	110.7	13.3	68.4

Table I, cont					
Turkey	2017	15.4	55.1	11.2	40.1
Britain	2017	42.5	132.4	29.0	90.4
the	2016			137.1	89.3
Russia	2017	77.8	107.9	41.1	56.9

A. Geographical limitations of Guiyang

At the present stage, there are still many obstacles in the system of talent flow in our country, which seriously affect the reasonable flow of talent between regions. Due to the lack of resources and inconvenient transportation, the economic development level of the western region is far behind that of the eastern region (table 2), making it difficult to attract excellent high-tech talents. At the same time, Beijing, Shanghai, Shenzhen and other areas are rich in scientific and technological resources and a good employment environment, which is the first choice for high-tech talents to start their own businesses and employment. According to the survey, 50% of high-tech talents are concentrated in developed areas such as Beijing, Shanghai and Guangzhou (table 3), resulting in a serious shortage of talents in western regions such as Guiyang.

Undoubtedly, to build an innovation-oriented central city under the background of big data, Guiyang is in urgent need of a large number of scientific and technological talents led by big data. However, at present, the shortage of talents, insufficient total amount and low level problems obviously delay the process of urban construction.

TABLE II FULL-TIME EQUIVALENT OF R&D PERSONNEL BY REGION (2017) (MAN-YEAR)

Region	Total	Researchers	Basic Research	Applied Research	Experimental Development
National Total	4033597	1740442	290090	489635	3253907
Eastern Region	2645815	1068104	157542	271331	2216956
Middle Region	683365	294341	42647	86750	553985
Western Region	522624	271269	57285	96902	368441
Northeast Region	181795	106729	32617	34653	114525

TABLE III FULL-TIME EQUIVALENT OF R&D PERSONNEL BY PROVINCE (2017) (MAN-YEAR)

Region	Total	Researchers	Basic Research	Applied Research	Experimental Development
Beijing	269835	163535	47429	70539	151874
Tianjin	103087	48423	7438	16182	79467
Hebei	113191	52972	5973	15434	91784
Shanxi	47694	22294	4573	10472	32650
Inner Mongolia	33030	15129	2126	4186	26718
Liaoning	88858	49390	10908	16062	61889
Jilin	45530	27679	10522	11164	23844
Heilongjiang	47406	29660	11188	7427	28792
Shanghai	183462	92389	20376	25415	137671
Jiangsu	560002	205616	19098	31851	509054
Zhejiang	398091	124415	9481	17567	371043
Anhui	140452	58142	10365	15833	114254
Fujian	140325	52185	6378	13993	119954
Jiangxi	61897	26637	4450	5494	51953
Shandong	304820	130465	17742	30211	256867
Henan	162504	64256	4577	14865	143062
Hubei	139990	64166	9122	19964	110917
Hunan	130829	58845	9561	20121	101149
Guangdong	565287	194453	22106	48805	494382
Guangxi	36857	20484	6446	11230	19182
Hainan	7715	3651	1521	1333	4860
Chongqing	79149	35289	5568	10770	62815
Sichuan	144821	77241	11630	25577	107613
Guizhou	28290	13327	3993	3906	20391
Yunnan	46576	23013	7502	8296	30778
Tibet	1249	911	422	416	412

Table III, cont				
Shaanxi	98188	54271	9666	20653	67869
Gansu	23738	14481	4335	5145	14257
Qinghai	5656	2819	758	960	3938
Ningxia	9859	4577	1503	1498	6858
Xinjiang	15212	9729	3338	4264	7610

B. Insufficient personnel training and backward personnel training mode

There are few high-quality universities in Guizhou, Guizhou university, Guizhou university of finance and economics, Guizhou normal university are the only universities with high quality. Although some universities have set up big data and other high-tech majors, and they are also starting to select undergraduate and graduate students. However, in the process of big data talent cultivation, there are not only problems such as weak teaching staff, insufficient funding and single training mode, but also such as the emphasis on education over ability, form over substance in the process of high-tech talent cultivation. In addition, there is a lack of necessary information communication and connection between education departments, scientific research institutions and enterprises, and a serious disconnect between production, learning and research, which makes it difficult to cultivate professional and applied scientific and technological talents needed for the construction of innovative central cities.

IV. TALENT COHESION STRATEGY OF INNOVATION-ORIENTED CENTRAL CITY UNDER THE BACKGROUND OF BIG DATA

To build Guiyang into an innovative central city, the construction of talent team is the first step. Cultivating and attracting innovative talents led by big data is an important strategy to achieve this goal. The construction of innovative talent team, short-term rely on talent introduction and policy guidance, enterprise incentive in short term. For a long time, we have been relying on the cultivation of talents in colleges and universities, the establishment of high-tech industry, the establishment of innovation and entrepreneurship platform and the creation of innovation atmosphere. Specifically, this paper puts forward the following Suggestions:

A. Optimize the environment for attracting talents: it is open and inclusive to attract talents

For most high-level technical talents, they expect an open and inclusive working environment rather than superior salary. To this end, Guiyang should open its mind, create an open and inclusive atmosphere of innovation and entrepreneurship, and be open-minded enough to welcome and accept talented people to settle in Guiyang. At the same time, we should increase the frequency of holding high-tech events such as data fair and big data innovation and application competition, so as to give more space to scientific and technological talents, establish a broad talent development environment, and attract more high-tech talents to develop here. In addition, the government should comprehensively consider the economy and politics and other aspects, and formulate positive preferential policies for the required high-level basic talents, so as to create an employment and entrepreneurship paradise for high-level technical talents.

B. Build a high-quality talent platform: build a big data platform to promote innovation

The movement of human capital is subject to the overall movement of productivity, and its spatial distribution depends on the spatial layout of productivity. From this perspective, the development of high-tech industry ill further create the demand for scientific and technological talents, promote the agglomeration of scientific and technological talents, and exert the effect of talent agglomeration. Therefore, the establishment of specialized research institutes and research institutions for scientific and technological innovation should be encouraged, the living conditions of big data innovation research institutions should be optimized, and the access conditions for private research institutions should be relaxed to encourage public innovation. We should set up big data expert association, and hold big data development forum regularly to give timely guidance to the problems arising from the operation of big data. The big data development center is should be established to pay close attention to the industry trends, analyze the industry trends, and accurately screen and learn the innovation direction of big data application technology, so as to provide a bright future direction for the employment of big data talents. Set up big data training and development base, and conduct key training on computer knowledge, information processing ability, data integration and screening ability. At the same time, we should build regional sharing collaborative innovation platform, pay attention to information sharing and joint development within and between regions.

C. Change the concept of talent cultivation: compound instead of specific

Nowadays, professionalization is the primary principle of talent cultivation and appointment in the society. Most colleges and universities cultivate single professional talents, while more enterprises employ professionals with high professional skills in a certain field, both of which lack the attention to compound and comprehensive talents.

Therefore, in terms of colleges and universities, instead of the traditional single teaching mode, strengthen the interdisciplinary interaction between the learning process, pay attention to the big data professional, combining with other professional to encourage large data minor in other professional or professional students studying in undergraduate choose double degree, cultivating such as "big data + management", "big data + financial", "big data + marketing", "big data + strategy", such as personnel, improve the new professional discipline system and the interaction between teaching and strengthening interaction learning and

communication between different disciplines. As for enterprises, they should pay attention to the introduction of interdisciplinary and comprehensive talents with knowledge and skills in such fields as statistical analysis, management and operation, software operation and art design. For the employed employees, we should provide them with opportunities to learn big data knowledge and skills, and actively advocate their transformation to inter-disciplinary talents

D. *Innovate the training mode of colleges and universities: promote self-sufficiency of local talents*

First of all, we should pay attention to the cultivation of application-oriented talents in local universities during the undergraduate stage, encourage more universities to establish application-oriented majors of big data, strengthen the cultivation of application-oriented talents such as "big data", and focus on cutting-edge technologies in professional fields by introducing professional simulation laboratories to improve the practical ability of college students. Secondly, school-enterprise cooperation should be carried out to strengthen exchanges and cooperation between enterprises and local universities. Colleges and universities should actively cooperate with enterprises with high and new technologies, so that students can be exposed to the real social environment, integrate what they have learned into real productivity, and enhance the output efficiency of application-oriented talents in colleges and universities. Thirdly, relying on the high and new technology industry in Guizhou province, it connects the high and new technology organizations and practical experts, professional research institutes and laboratories in Guizhou province, so that college students can master the latest technology trends and current industry facts, and ensure the application of every learned skill. Finally, the smooth employment channels and high-quality employment positions after graduation of big data and other applied talents are the guarantee to retain talents, so as to provide talent support for the innovative development of Guizhou.

E. *Combine production, education and research to cultivate talents*

The combination of production, study and research is an important way to implement the party's educational policy and adhere to the principle of combining theory with practice. The "two-way participation" of schools and society, and introduce scientific research and product development into teaching process can effectively cultivate students' practical ability, innovation ability and entrepreneurial ability, which is an important embodiment of the combination of education and productivity. It is a new way to accelerate the training of applicable scientific and technological talents by involving enterprises, universities and research institutes at the same time. It can increase the practicability and social value of scientific research achievements, closely link the learning gains of college students with the real needs, and thus increase the added value of the knowledge and skills they have acquired after employment. In this way, talents that be directly utilized by the society and enterprises can provide talent guarantee and endogenous impetus for urban construction relying on big data technology in Guiyang.

V. CONCLUSION

The bottleneck of high-tech talents is the biggest stumbling block of Guiyang in the process of innovative central city construction, but a strong talent team as a support is the necessary condition in the construction process. Formulating the cohesion strategy and mechanism of talents, therefore, can effectively remove the short board of talents, solve the problems in the construction of innovation-oriented central city so as to accelerate the creation of innovative central city. Which can help Guiyang to be a "engine" and "locomotive" of economic development in the overall Guizhou, become a leading innovation center of economic zone and even the entire province spanning development in the overall Guizhou, and radiation throughout the southwest area of innovation and development.

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