Research on Competitive Advantages of Guiyang Big Data Industry: Based on the Revised " Diamond Model"

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Abstract Along with the development of information technology such as cloud computing, big data is developing rapidly toward a new generation of information technology and service form, but it also becomes a common opportunities and challenges faced by different industries. According to the revised "diamond model" theory, this article makes an in-depth analysis of the competitive advantage of Guiyang big data industry development, starting from six aspects, which are high-level element of production, market demand, related industries and support industries of big data, ability of technology research and development, opportunities and the government and the system. The article also provides with positive improvement suggestions.

Keywords Revised "diamond model"; Big data industry; Competitive advantages

1 Introduction

In 2011, McKinsey & Co first put forward the idea "Big Data era has come" in its research paper called "Big Data: The Next Frontier for Innovation, Competition, and The Productivity".[1] It suggests that data has been penetrated into all field and industries, gradually becoming important factors of production. The use of huge amounts of data will herald the arrival of the new wave of productivity growth and consumer surplus (James and Michael, 2011). He also made a definition for big data, "big data is a term for data sets that are so large that traditional data processing applications are unable to collect, store, manage and analyze". McGuire et a1. (2012) elaborated five ways to bring new competitive advantages: information transparency, trading information digitalization, tailored products and services to different market segment, sophisticated analysis,

and prospective development. Viktor Mayer – Schonberger (2013) stated that country's size of data and the ability to apply the data will become an important indicator of the comprehensive national strength. In 2016, "China's big data industry summit & China e – commerce innovation and development summit" was once again successfully held and issued "Declaration of Guiyang's Big Data". Guiyang, which is underdeveloped, has made electronic information industry development led by big data an important measure, to keep implementing the "two base lines", which are developmental and environmental. Big data is like "another oil in the future", thus the control of data will become the new focus. Hence, this paper attempts to make analysis of competitive advantage of Guiyang's big data industry by studying "diamond model" theory, and make recommendations for future development.

2 A revision of "diamond model"

Considering the actual condition of Guiyang big data industry development, the original model is modified. Firstly, the government factor is put in a central position. Secondly, the opportunity factor is promoted as main factors. Because for high – tech industry, opportunity can be controlled by market demand analysis and multinational cooperation. Thirdly, enterprise's competitiveness, strategy and structure are modified into research and developing ability of big data industry's technology.

3 Analysis of Guiyang's big data industrial competitive advantage based on the revised "diamond model"

3.1 High – level elements of production

(1) Human resources. In 2016, the number of high – tech industrial workers exceeded 60000 people in Guiyang, which increased by 10% compared with last year. The first big data public training platform was established to cultivate talents.

(2) Technical resources. According to 2015 *national patent report*, contribution rate of scientific and technological progress for Guizhou have reached 45.42%, and newly high – technology industrial output have valued at 282 billion Yuan. Guiyang occupied 77 items of scientific and technological achievements (accounting for 82.8%).

(3) Capital elements. By the end of 2016, the total volume of Guiyang big data industry has exceeded more than 90 billion Yuan, which shows a growth rate of 47.5% (26.4% higher than the investment of Guizhou).

3.2 Market requirements

(1) People´s livelihood field. Big data can blend the advanced technology into people´s life. Guiyang Uses the Malang company's mature platform of medical big data to establish telemedicine application system.

(2) Business field. Through analyzing data, enterprises can market efficiently and lower cost. Guiyang use "Lao Gan Ma" company's commercial project as experiment to establish application innovation system of big data to enhance core competitive ability of enterprise.

(3) Social field. It can optimize the distribution of social resources. Excavate the value of data to assist the government decision – making, and realized a complete coverage of the data by using the cloud data platform.

3.3 The related and supporting industries

(1) It includes communications, transportation, manufacturing, finance and logistics. The existence of an industry of competitive advantage and its related industry are interacting, "industry cluster" can improve the rate of production and innovation. The development of Guiyang big data industry should depend on the cooperation of whole industry chain (Picture 1).

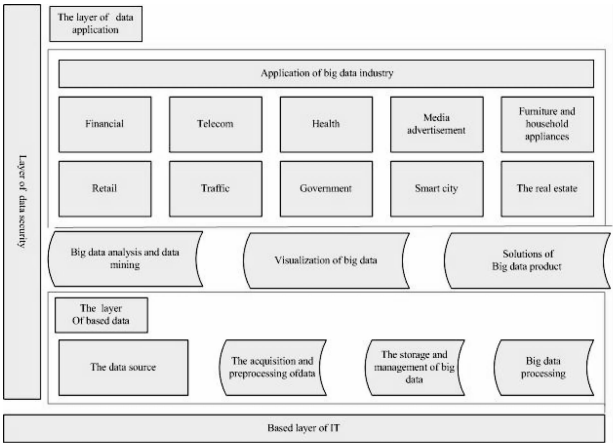

Figure 1 The chain of big data in Guiyang

(2) In 2015, there are 227 new registered and associated big data enterprises in the city. From January to April in this year, the proportion of Internet and related services increased above 70% in Guizhou. At present, Guiyang big data industry has formed a system of data mining and settle, accelerates the development of cloud services and basic software.

3.4 Research and development ability

The ability can be summarized as data acquisition, storage, statistical analysis and data mining, etc. The emergence of cloud computing laid a solid foundation for development of big data analysis and processing.[2] At present, Guiyang has established 133 institutions of research and development. In 2015, the number of patent applications of High – tech Industrial Zone enterprises reached 6952, the patent invention grew by 79.10%, new practical patent grew by 64.06%. However, it also faces challenges: Firstly, lack original technology of big data research and development. Secondly, lack deep mining technology tools, and industry chains is still split.[3]

3.5 Opportunities

(1) From the perspective of nation, the state council issued *The outline of promoting the development of big data operation*. As a part of the strategy of national development, Guiyang develops big data industry not only conforms to the situation of national development, but also fit the development of High – tech zone.

(2) From the perspective of province and city, according to *big data application plan for industrial development in Guizhou* (2014 – 2020), Guiyang see the development of big data as an important support of"corner overtaking". It has a convenient condition and gets support of provincial and municipal governments.

(3) From the perspective of own development, Guiyang collects advantage resources, the whole industry chain development pattern is formed now. It is speeding up constructing cloud computing platform to attract big data enterprises.

3.6 The role of the government and policy

(1) From the perspective of nation, our country has established strategies of big data development in Guizhou. In 2014, the state council issued the approval to set up Guian high – tech zone in Guizhou, and established it as an important economic growth pole of the western region.

(2) From the perspective of local government, the outline has pointed out the direction for the development of big data industry. The policy about speeding up the application of big data industry indicated that we should accelerate cultivation of big data industry. It cleared about the preferential policies of big data industry introduced, included tax preference, rewards, subsidy, etc.

4 Suggestions of improve industrial competitive advantage of big data in Guiyang

4.1 Optimize the structure of advanced factors of production.

Firstly, build an integration cooperation mechanism of personnel training, support enterprises to introduce big data talents with practical experience.[4] Secondly, increase utilization of knowledge resources. Integrate data of government to stimulate business application, try to streamline administration and institute decentralization. Thirdly, improve the quality of the staff knowledge. Enterprises can carry out training by cooperating with scientific research institutions according to demand.[5]

4.2 Create a good atmosphere of market.

Firstly, we should use law to regulate the use of data and standardize market order. Secondly, we should introduce policies of encouraging development of big data industry include tax policy, talent introduction, etc. Thirdly, we should guide the enterprise independent innovation, improve strategic alliance of technology innovation to extend application, develop emergence of intelligent manufacturing, etc .

4.3 Synchronous development of related and support industry.

Firstly, we should expand information service industry and blend new Internet technologies in various fields. Secondly, support to build industrial zone of big data to lead the development of related industry by sharing resources. To speed up building complete industrial chain of big data. At the same time, enterprises need insisting on making applications drive software technology and innovation of business model , to form a good interactive structure of industry.

4.4 Improve the ability of technology and research of big data.

Firstly, build communication platform for enterprises and scientific research institutions in Guiyang, introduce external forces to promote innovation ability. Secondly, build technology research and development centers of big data, introduce innovative resources to Guiyang. Thirdly, establish a complete system of innovation and guarantee the legitimate rights and interests of developers, investors and consumers. [5]

4.5 Seize the opportunities of development of big data.

Firstly, make use of existed advantages of big data development in Guiyang. These advantages ensure that companies keep away from large - scale disasters and lay the foundation of talents, industries and applications. Secondly, enhance communication to absorb advanced technology. Thirdly, we should comply with the trend of world actively, grasp the new dynamic of research about big data industry.

(6) Strengthen the role of government. Firstly, explicit strategic aim of big data industry in Guiyang . Continue to improve policies and give more support in aspects of finance, electric power supply, etc. Secondly, regulate the relevant laws of big data industry. We should try to legislate firstly about resources rights and interests, strengthen the security protection of basic information networks and important information system.

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