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Oracle Information processing technology visualization analysis

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ABSTRACT

Using DII(Derwent Innovation Index) patent database as data source, this paper USES Cite space software to visually analyze oracle's information processing technology patents. This paper analyzes the annual trend of patent application, the distribution of disciplines, the distribution of patentees, and the technical hotspots, and reveals the overall development trend, research hotspots, industry-leading enterprises, and related disciplines of Oracle's information processing technology. On this basis, Suggestions and countermeasures are proposed for oracle's information processing research.

Keywords: *Oracle; Information processing technology; Patent information; visualization.*

Introduction:

Oracle's research is not only a pure academic things, but also with strong cultural self-confidence, strengthen the cultural soft power[1], Chinese culture to go out is closely related[2]. The study of the inscriptions on bones plays an important role in the development of Chinese traditional culture and the construction of Chinese national spirit, national values and national strength [3].

Since the discovery of oracle-bone inscriptions, statistics show that there are about 160,000 pieces of oracle-bone inscriptions, 4,500 characters, and about 2,000 have been interpreted [4]. The difficulty of deciphering the oracle we see, but fortunately now countries advocate JiaGuXue research more and more[5], and more and more new talent to join, big data using the emerging technology, artificial intelligence and the disciplines of mutual integration, in order to oracle information carries on the deep analysis and research, and finally solve the problem of oracle interpretation difficult[6][7]. Deepen the research on the historical thought and cultural value of Oracle, promote the cultural exchange between different civilizations, the development of Chinese civilization and the progress of human society[8].
This paper makes a visual analysis of the information processing related patents with the inscriptions on bones in the past 20 years[9], analyzes its technical hotspots, and makes a patent analysis of its technical hotspots. It provides new research direction and reference for the information processing with the inscriptions on bones, as well as technical guidance for the research with the inscriptions on bones in China[10].

Patent measurement is based on the measurement information in the patent as the basis of analysis and research[11]. Through the measurement analysis of the patent, it can gain insight into the development status of industry technology, identify competitors and their key points and strength of technical activities, and judge the competitive situation of the industry[12].

In this paper, the author makes a bibliometrical analysis on the relation between the number of patent contributions and the distribution organization of oracle oracle information processing technology collected in The Devwent Patent Database (DII), so as to discuss the research and development status, technical hotspots and future development trend of oracle information processing technology.

Data sources and data analysis:

Data Sources

Because the Devwent Patent database is a foreign language database and ensures the integrity of the retrieved patent data, in the Devwent Patent Database (DII), "Oracle", "Oracle rubbing", "Input method", "Natural Input method of Pictograph * Chinese characters", "Machine learning", "Automatic Character Recognition", "Natural language"

Processing and other English keywords are used as search terms to retrieve the relevant patents of Oracle's information processing technology. The time span is from 2000 to 2020. A total of 894,048 patents were retrieved. In order to ensure its accuracy, Oracle was used as a key word and Oracle was excluded to conduct a second search, and 1,821 related patents were finally retrieved. Then the 1821 patents were exported in Plain text (Plain text). The exported content included the patent number, title, patentee, inventor, abstract and other specific information for visual analysis.

Oracle information processing technology patent time distribution

It can be seen from Figure 1 that the number of patents in the research of oracle bone inscriptions information processing technology in China is on the rise. Although oracle inscriptions information processing technology has only just begun to develop from the beginning of the 21st century, we can see from the number of patent growth in recent years, China's oracle inscriptions information processing technology has entered a new stage, especially since the last 10 years.

From 2001 to 2011, the development of Oracle's information processing technology in the past 10 years was relatively stable, and the number of patents was always between 20 and 30. Except for a small peak in 2008, the number of patents directly increased from 20 to 50, which increased by more than two times in one year. Since 2011, the number of oracle information processing technology patents in China has increased rapidly, making China the country with the largest number of Oracle information processing technology patents. In particular, from 2015 to 2016, the number of patents doubled again and exceeded 100 for the first time. In 2018, the number of patents reached its peak.

2019 is the 120th anniversary of the discovery, represented by secretary xi jinping at the great hall of the people held in the "oracle" as the theme of the symposium, xi general secretary pointed out that countries attach great importance to the spread and development of Chinese excellent traditional culture, represented by oracle, its manifestation is the oracle of r&d institutions and interdisciplinary cooperation to carry out the research and application of oracle. At the same time, vigorously cultivate a group of interdisciplinary talents, improve the research level of Oracle. According to the "growth curve", the oracle information processing technology has just gone through the first two stages, which indicates that there is still a large space for researchers to play in the future in oracle information processing technology. Therefore, in the next few years, oracle information processing technology will enter the third stage of the "growth curve" : the high-speed rising period.

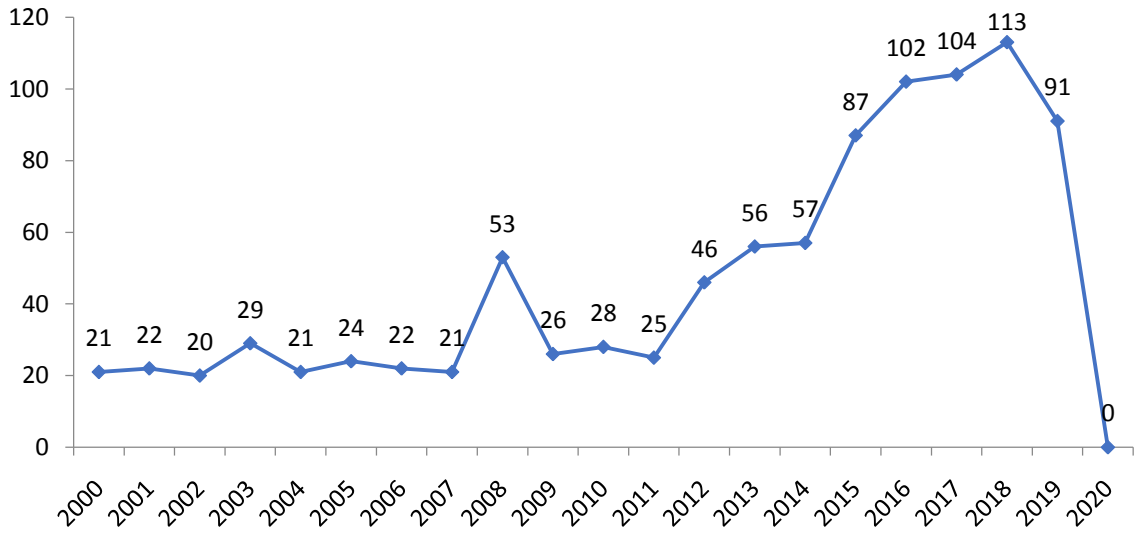

Figure 1 Oracle information processing technology patent application trend

Oracle information processing technology patent field distribution

Over the past 20 years, oracle's patents related to information processing technology have mainly involved engineering design, computer science, telecommunications, instrumentation, automatic control system, chemistry,

general internal medicine, energy and fuel, sports science, polymer science and many other disciplines. Especially of the engineering and computer science is the discipline, compared with other disciplines, is ahead and the patent quantity are more than 1700, according to the world in recent years in the field of engineering and computer science and technology subject development condition, this shows that oracle information processing technology in the gradually diversified, intellectualization.

We can know from the data in table 1, oracle information processing technology of some patents involving multiple disciplines, we can see from the field distribution of oracle information processing technology is mainly involved in oracle information processing (computer aided spatialization, natural language processing, computer aided splicing bones, etc.). As the country's emphasis on oracle and oracle development momentum in recent years more and more, oracle information processing technology patent also involves chemical disciplines, the general internal medicine, energy and fuel, sports science, polymer science and other fields, suggesting that oracle patent information processing technology have infiltrated a number of different disciplines, multidisciplinary cross and contact oracle for all countries patent information processing technology research and development personnel to provide more and more new breakthrough point, for the development of oracle and played an important role in promoting the development of Chinese culture.

Table 1 Distribution of Oracle Bone Inscriptions Information Processing Technology Patent Disciplines (top 10)

Subject areas	The number of	The percentage
ENGINEERING	1788	98.2
COMPUTER SCIENCE	1755	96.4
TELECOMMUNICATIONS	392	21.5
INSTRUMENTS INSTRUMENTATION	275	15.1
AUTOMATION CONTROL SYSTEMS	49	2.7
CHEMISTRY	29	1.6
GENERAL INTERNAL MEDICINE	24	1.3
ENERGY FUELS	13	0.7
SPORT SCIENCES	13	0.7
POLYMER SCIENCE	12	0.66

Patentee distribution

We used Citespace software to analyze the data of Devwent's patent database, and used the function of "Institution" in the database to draw the visual knowledge map of the patentee of oracle's relevant patents of information processing technology [13]. Since this study is a study on the relevant patents of oracle bone inscriptions information processing technology in the past 20 years, the total time cycle is relatively short, so time Sliping (time slice) selects "1" and top N selects "50" (the top 50 data of each slice is displayed), and the knowledge graph is obtained as shown in Figure 2. The size of the nodes in the figure is proportional to the frequency of the patentee. The larger the node is, the more frequent it is. The degree of connection between patentees is positively correlated with the intensity of cooperation between them. It can be seen from Figure 2 that more than half of the patentees are presented as an independent point, indicating that most patentees conduct research on oracle bone inscriptions information processing technology in a solo manner. At the same time, there are some weak links, indicating that there is some cooperation between some patentees, but the cooperation is not strong.

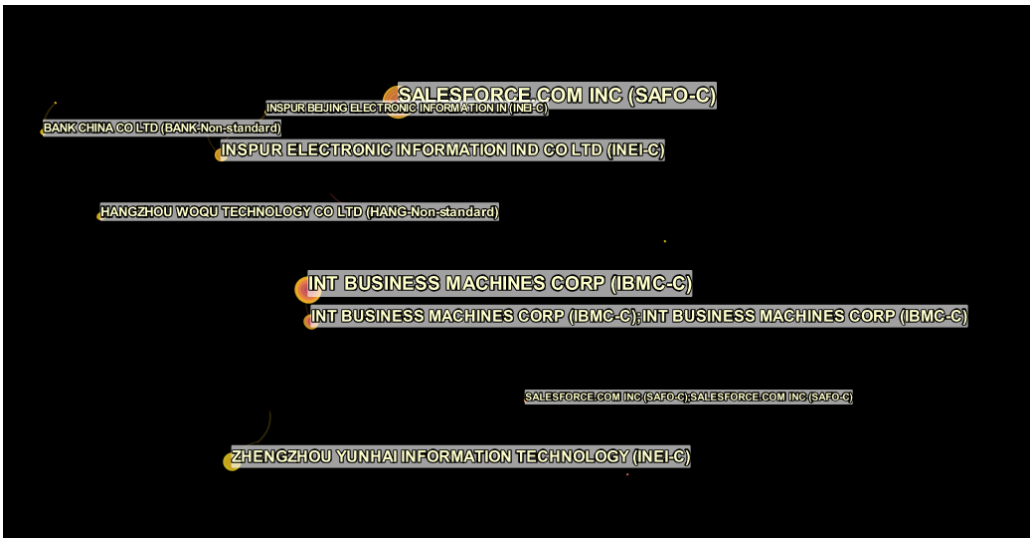

Figure 2 Distribution of patentees of Oracle Bone Inscriptions Information Processing Technology (top 10)

According to the statistical analysis of the patentees of Oracle information processing technology-related patents by using The Database of Devwent, we can get the data: there are 1636 patentees in the database of 1821 patents, which also indicates that there are many patents applied by the patentees. The patentees of Oracle's information processing technology patents are mainly concentrated in the United States, China and Japan. In terms of the number of patentees, the United States ranks first and has an obvious advantage, followed by China. From the nature of the patentee, most of them are world-famous large enterprises. In the United States, patent holders are mainly distributed in IBM, SALESFORCE COM INC (a customer relationship management (CRM) software service provider), INSPUR ELECTRONIC INFORMATION IND CO LTD (INSPUR ELECTRONIC INFORMATION Industry CO LTD), MICROSOFT CORP (MICROSOFT), COMMVAULT SYSTEMS INC (Comwall) and other companies. Among them, IBM is the number one and a leader in the computer industry. Its most notable achievements are large/small computers and portable computers. In particular, the personal computer standard developed by IBM is still in use and development. In addition, IBM is a leader in mainframe computers, supercomputers (represented by Deep Blue, Blue Gene, and Watson), UNIX, and servers; IBM Software Group also provides software industry solutions and middleware products in the software field. IBM also has deep achievements in materials, chemistry, physics and other scientific fields. The hard disk technology, scanning tunneling microscope (STM), copper wiring technology and atomic etching technology are all invented by IBM Research Institute. IBM's knowledge and achievements in the field of engineering design can be said to be second to none, and it is also the leading company in patent application in the United States. Therefore, THE relevant patents of IBM's information processing technology in Oracle deserve to be ranked first. China has four companies in the top 10, but relatively few patents. It can be seen that China's oracle bone inscriptions information processing technology needs to be further improved. Although the number of patents ranks among the top, the distribution of patent applications is still relatively scattered, lacking leading enterprises. However, patent applications in Japan, the United States and other countries are mostly concentrated in well-known enterprises, that is, the patent applications of foreign enterprises are relatively concentrated, leading enterprises have obvious advantages.

The research conclusion:

Based on the patent analysis of oracle bone inscriptions information processing technology in this paper, the following conclusions are drawn:

1. From the time distribution of oracle bone inscriptions information processing technology patents, we can see that China has made rapid progress in oracle bone inscriptions information processing. From the growth curve, in recent years, China is still in the second stage of low-speed development in oracle bone inscriptions information processing technology. According to the development speed of Oracle's information processing technology patents, Oracle's information processing technology is about to enter the third stage: the high-speed rising period.

2. In the patent data to retrieve oracle information processing technology, it can be seen that China in recent years on the oracle information processing research involves multi-disciplinary, gradually diversified, that currently involved in oracle technology related to information processing is novelty, inventiveness and practical applicability, indicates that at present China is still at the stage of development of oracle's information processing, the oracle researchers still need to make efforts in new technology.
3. According to the classification analysis of patent applicants, IT can be seen that patent applicants are mainly IT enterprises, and the degree of correlation in the research process of each enterprise is not high, indicating a low degree of cooperation between enterprises. Thus it can be seen that enterprises have become the core of new technology research and development, which is very important for a country's technological development, especially for China, because China attaches great importance to enterprises' technological research and development in recent years. For enterprises, the present stage is an important period for them to seek breakthrough in technology theory and seize the leading position in technology.

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