

Analyzing the Research Progress of Business Management Science from the Perspective of Informatics

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Abstract

Purpose: The purpose of this study is to take a comprehensive look at the state of development of business management science around the world and to provide appropriate research support based on this. **Methodology:** The research team uses scientifically sound research tools through the practical approach. They conducted research using the methods of network open-source data and patent data analysis in informatics and obtained relevant results to support the in-depth research. **Conclusion:** The methodology proved to be a good support for the study. Based on effective research results, discussions have been conducted and suggestions for the development of business management in China have been provided from multiple perspectives.

Keywords

Informatics, Business Management, Analysis, Recommendations

1. Introduction

Business management, as an important branch of management, is a highly applied discipline. It is based on the basic theories of management and economics and studies how to utilize modern management methods and tools to carry out effective enterprise management and business decision-making (Gallage & Laferriere, 2023; Mantri & Mishra, 2023).

Informatics is a new discipline that studies the regularities of representation, acquisition, processing, transmission, and use of information (Ranusch et al., 2023). Informatics is a complex discipline in which information is regarded as the object of study and computers and other technologies are regarded as the

tools of study, with the main aim of improving the information functioning of human beings (Ammenwerth, Wilk, & Huang, 2023; O'Neil et al., 2023). Two of the important methods that can help to understand the development of the relevant specialties are Internet statistics and patent analysis (Murooj & Pavel, 2018; Marewski & Schooler, 2011). By using the above two as tools, the macro analysis of the development of the business management discipline and the state of the industry can help to obtain all kinds of high-value research reference information, to grasp the development trend of the industry from a general point of view and carry out the relevant layout.

Through the use of large databases such as “Web of Science database” and “China Knowledge Network Database” to search for the keywords “Informatics & Business Management Science”, we found that there are only a few related literature and research. It would be innovative to carry out research on the state of development of management science through the use of informatics as a research tool, which fills a gap in research in this field.

The full text is organized as follows. In the chapter “Materials and Methods”, the two methods of “Internet Statistics” and “Patent Analysis” used in this study and the corresponding data sources are introduced. In the “Results and Analysis” section, the results of the analysis of the data based on the above two methods are presented. In the final section “Suggestions and Reflections”, recommendations are made for the development of the study based on the results of the analysis.

2. Materials and Methods

2.1. Internet Statistics

Baidu Index is a data analysis platform based on Baidu's massive Internet users' behavioral data. It is one of the most important statistical analysis platforms in the modern Internet and even in the whole data era, and since its release, it has become an important basis for the marketing decision-making of many enterprises. The main functional modules of the Baidu Index are trend research based on individual words, demand mapping, public opinion stewardship, and crowd profiling; the general trend is based on industry, geographical distribution, crowd characteristics, and search time characteristics (Wu et al., 2023; Wang et al., 2023).

360 Trend is a big data presentation platform based on the massive user data of 360 products, which can be used to quickly access popular trends through keyword searches, understand real user needs, and understand the attributes of keyword searching crowds. It is based on 360 products' massive user data as a big data display platform, 360 trend can tell the user: that a keyword in the 360 search scale is how big, a period up and down trend and change, pay attention to these words what kind of netizens, distribution in where and other dynamic information.

2.2. Patent Analysis

INCOPAT is a patent database platform with independent intellectual property rights and more than 100 million global patent data; it contains basic data from trials in more than 70 countries and regions; it synthesizes data about homologations, citations, assignments, licenses, encumbrances, industrial and trade enterprises, customs records, standard patents, etc.; it has a wide range of search and statistical analysis fields, 340 search fields, 105 filtering fields, 80 custom analysis fields, 145 download fields, allowing users to combine multi-dimensional searches to improve search speed; it combines several functional modules, such as intelligent patent search, large database analysis, batch downloads and so on (Ma et al., 2018; Caviggioli, Colombelli, & Ravetti, 2023; Yang et al., 2023).

3. Results and Analysis

3.1. Internet-Based Data Analysis

In terms of domestic attention, using the “Baidu Index” to analyze, the corresponding results are shown in **Figure 1 “A”**; using “360 Trend” to analyze, the corresponding results are shown in **Figure 1 “B”**. “B” is shown in **Figure 1**. The vertical coordinate indicates the number of people who follow this headline daily. It can be found that from 2011 to the present, the attention of all sectors of society to this field has always been at a high level, and after 2021, there is a slight decline, but the overall situation is relatively stable. Such results show that

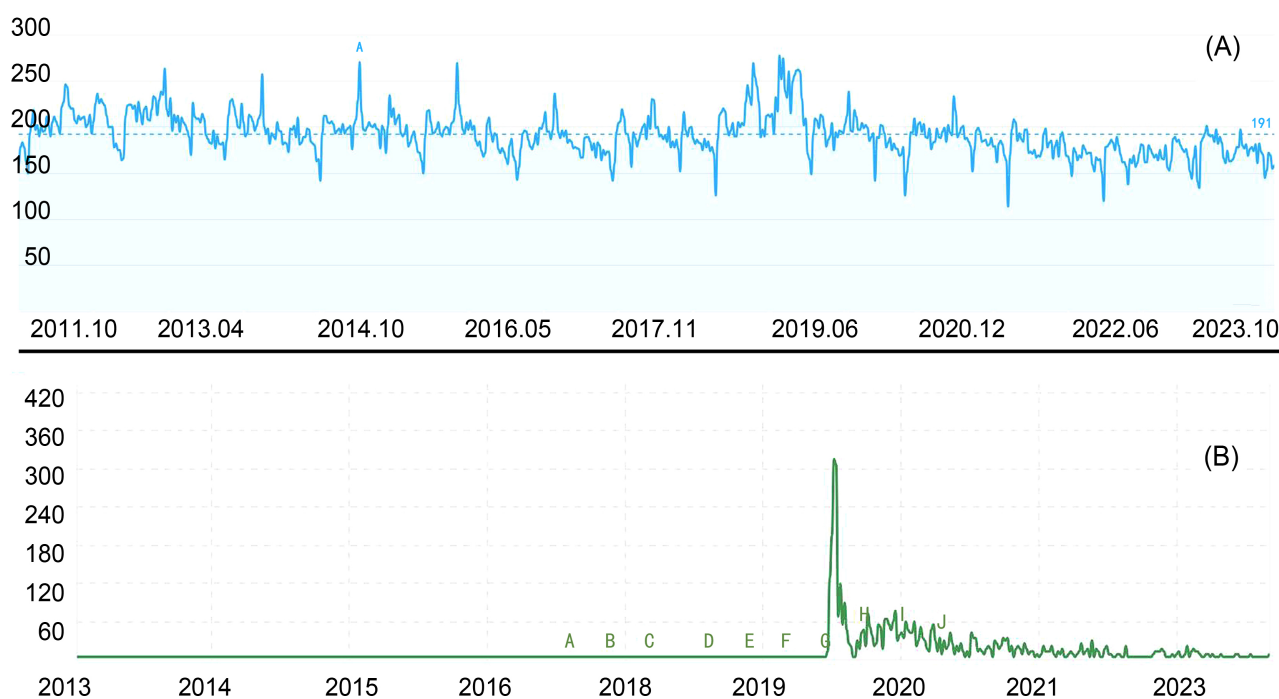


Figure 1. Analysis results based on “Baidu Index” and “360 Trend” (screenshot from “Baidu Index” and “360 Trend” website analysis results).

the community's interest in "business management", and good social attention is conducive to the mobilization of research resources and strength, which is conducive to promoting the in-depth development of the discipline. The results graphically show that the overall trend is a smooth state, which shows that there are not many breakthrough developments in this field of research, much less the production of disruptive results, and such results demonstrate the difference between social science research and technological science research. The results of the "360 Trends" analysis show that after 2019, society's enthusiasm for "business management" increased, and this result is closely related to the development of Chinese society and the increase in demand for business management. After a period of enthusiasm, the level of interest quickly declined, then stabilized, and has now entered a trough of interest. This shows that society is tired of paying attention to this issue, and this is largely due to the lack of research innovation in this field, which has not had a sufficient impact on social development.

3.2. Patent Library Analysis

Using the INCOPAT patent analysis tool, the patent situation in the field of "business management" is examined. The search keyword used in the study was "business management".

Overall, the number of patents in this field has increased significantly since 2012 and will reach its highest value in 2021 (Figure 2). The rapid development of research in this field during this period is also driven by social demand, during which the global economy continues to grow, and the results of related

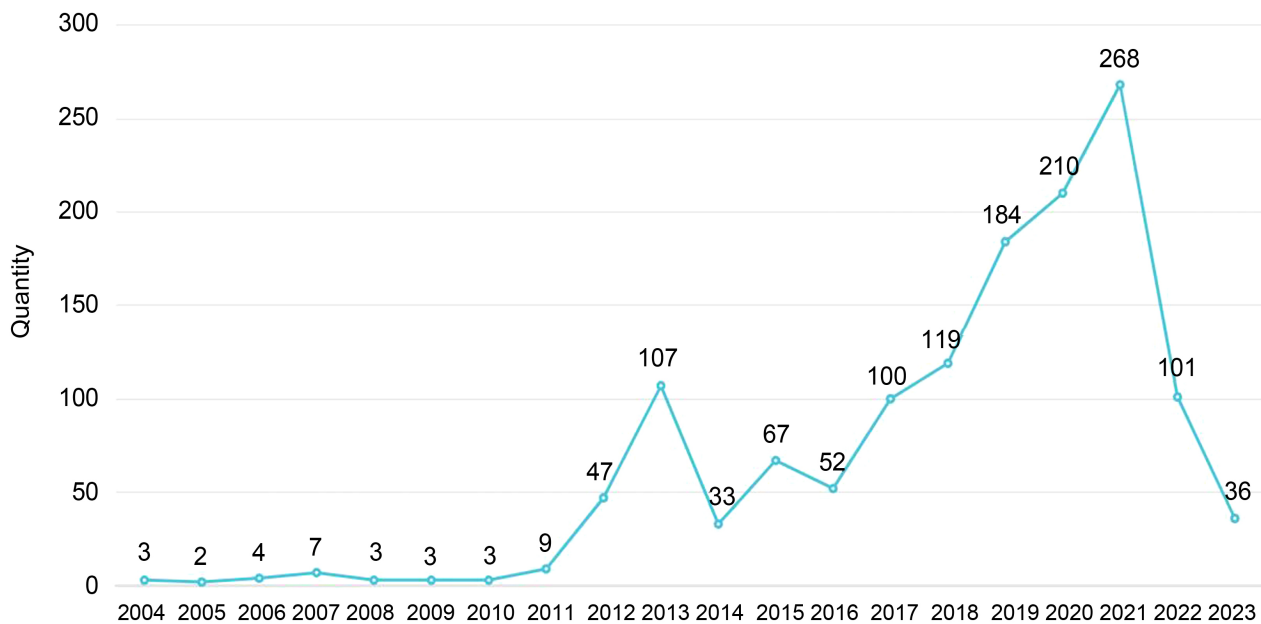


Figure 2. Patent applications in the field of "business management" worldwide (screenshot from the results of analysis on the INCOPAT website).

research are improving year by year. However, due to the impact of the epidemic and economic recession, the investment in related research is significantly reduced, and the research results in this field are significantly reduced. In the following, this study looks at both international and domestic dimensions.

At the international level, countries have continued to promote research in the field of “business management”, which demonstrates the value of research in this area, but there has been no significant increase, which suggests that this type of research is at a plateau or a bottleneck in its development. With continued investment and support, more breakthroughs will surely occur in the foreseeable future.

Through the analysis, we can grasp the distribution of the relevant technology in the global scope of this research, according to the analysis results show that, by the number and types, China’s advancement in this field is at the forefront of the world, resulting in the corresponding types of patents are: A47B, G09B, B65D, G06Q, B43L, G09F, G06F, B42F, F16M, A47F. Other Western countries and relevant international organizations also continue to work in this field, and the corresponding types and numbers are more than our country by a large gap. Other Western countries and related international organizations also continue to work in this field, the corresponding types and numbers of our country by a large gap (Figure 3).

According to the number of patents generated, Henan Province, Shandong Province, Heilongjiang Province, Jiangxi Province, Guangdong Province, Jiangsu Province, Zhejiang Province, Shaanxi Province, Sichuan Province, and Shanghai Municipality, rank among the top. Geographically, the eastern region generates

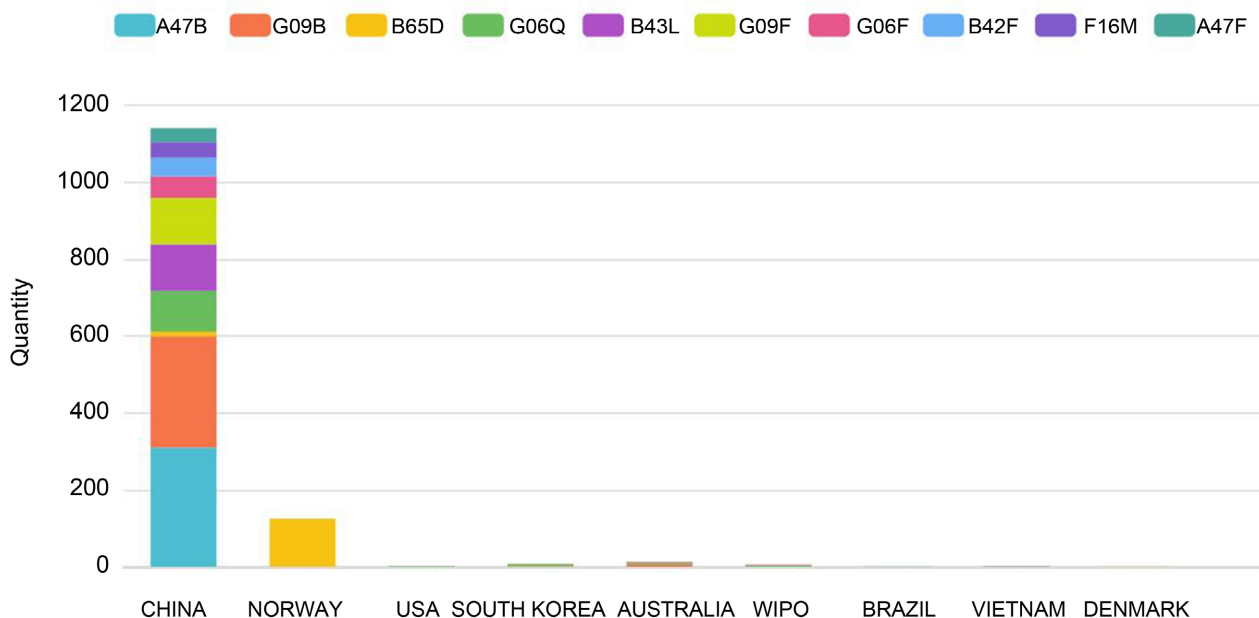


Figure 3. Global distribution of patents in the field of business management (screenshot from the results of analysis on the INCOPAT website).

the largest number of patents and is the most innovative in the field of business management research, while the Henan, Sichuan, and Shaanxi provinces represent innovation in the central and western regions. Among the eastern coastal regions, the Yangtze River Delta and Pearl River Delta are the most abundant. This is partly due to the developed economy and the large support force born from the demand of business clusters; on the other hand, it is the developed education and the large number of universities that can support the practice of innovation in related fields.

As shown in **Figure 4**, it is also the Yangtze River Delta and Pearl River Delta regions that have achieved a significant amount of innovation in the field of business management. This indicates that the continuous investment and support for business management innovation in relevant regions have formed sufficient benefits, and results continue to emerge.

According to the analysis results of INCOPAT, by examining the strong areas of business management innovation, it can be seen that each region has a relatively comprehensive category of patents obtained, including A47B, G09B, B43L, G09F, G06Q, G06F, B42F, F16M, A47F, and H04N types. In the Yangtze River Delta region, Jiangsu Province has the most abundant innovation; In the Pearl River Delta region, Guangdong Province has the most abundant innovation. From a practical perspective, both businesses in related fields are relatively developed.

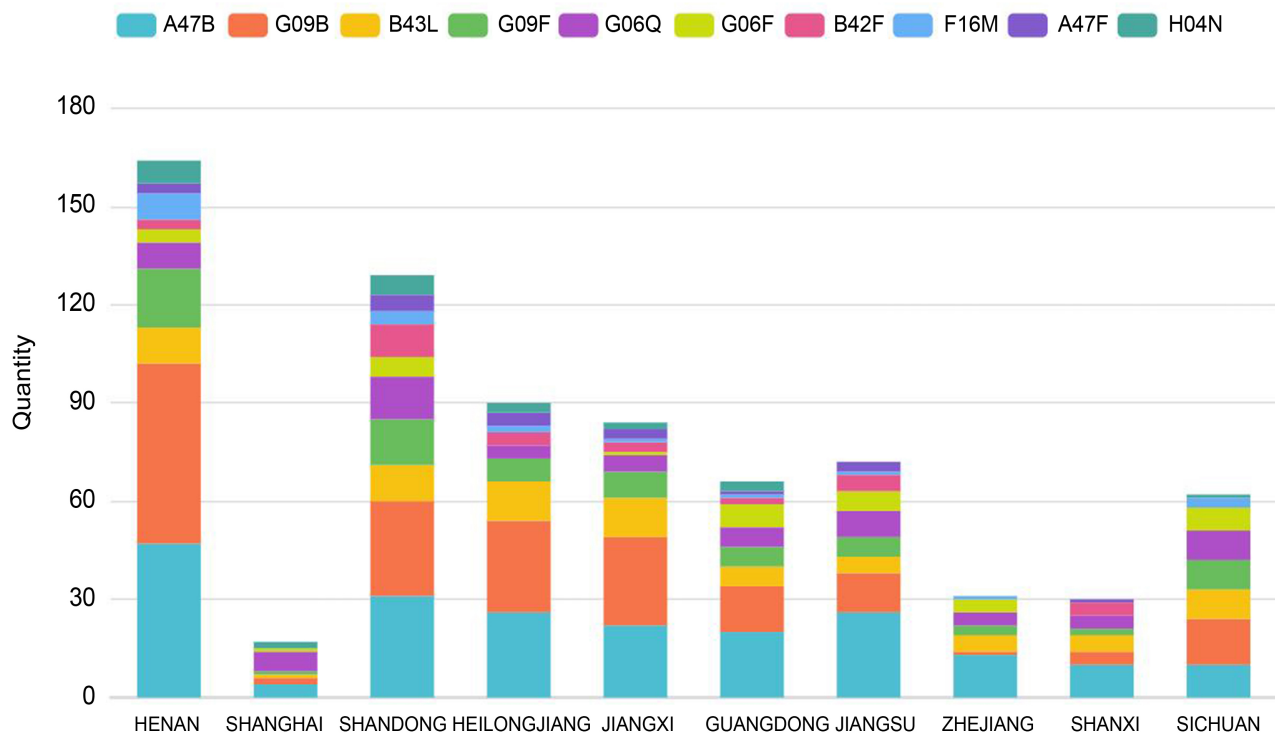


Figure 4. Distribution of relevant patents in the field of “business management” nationwide (screenshot from the results of analysis on the INCOPAT website).

4. Suggestions and Reflections

In the previous chapter, results based on extensive data support were obtained and the relevant conclusions can be summarized as follows.

4.1. The Current Policies for the Development of Business Management in China Have Practical and Scientific Significance

The most direct feedback on the effectiveness of government policy formulation comes from actual results. From the current effectiveness, the planning of relevant policies for the development of business management is successful. The above extensive research results demonstrate the feasibility of relevant policies and plans in China.

4.2. China Still Needs to Continue to Make In-Depth Efforts in Promoting Business Management Research

From an international perspective, although China has obtained a large number of patents and innovations in the field of business management, this does not mean that China is already in a core position in this field. The development of management requires long-term practice and accumulation, so it is also necessary to continuously promote the development of this research at the national level and create suitable soil.

4.3. The Deepening and Development of Business Management Science Requires a Strong Commercial Foundation

As can be seen from the results of previous analyses, the development of business management science has been more rapid mainly in the eastern seaboard and in the central and western regions where the business base is more developed. While there is already an imbalance in development across the country, business management science, as a soft science, does not require a large number of hardware entities like engineering science, so it would be a practical path to utilize the scientific research results of the advanced regions to serve the users in the relatively disadvantaged regions.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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