

Empirical Analysis in the Development of Management Science and Engineering

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Abstract: With the rapid development of science and technology and the improvement of people's living standards, the emphasis on the construction of management science and engineering disciplines continues to deepen. Judging from the actual development of management science and engineering disciplines, there are still many problems and deficiencies, affecting the sustainable and stable development of the subject. This paper mainly explores and makes empirical analysis on the related problems and countermeasures of the development of management science and engineering disciplines, hoping to provide a certain reference for the sustainable development of management science and engineering disciplines.

1 Introduction

Since the birth of the discipline of management science and engineering at the beginning of the last century, it has always received extensive attention. As a discipline that studies management activities and laws, the discipline of management science and engineering includes various theories such as mathematical theory, statistical theory, computer theory, and engineering theory. The knowledge of the discipline also has very important application value in the industrial field. Compared with developed countries, the management science and engineering disciplines in China started late, but developed at a faster pace. With the improvement of the industrial system, this discipline has played an increasingly important role, laying a solid foundation for the sustained and stable development of China's industry and economy. Therefore, it is necessary to strengthen the inquiry into the development of management science and engineering disciplines, and adopt effective strategies to promote the smooth progress of management science and engineering disciplines.

2 Overview of Management Science and Engineering

The discipline of management science and engineering is a cross-discipline. The content and system contained in it are very complex. Students of this discipline not only need to learn professional management knowledge, but also understand the basics of mathematical economics and computer applications. Management science and engineering refers to the application of management scientific engineering methods and scientific economics and other related methods, with the help of computer technology to study economic, social and engineering related management issues. Under the discipline of

management science and engineering, a variety of professional directions such as engineering management, management information system and logistics engineering are set up, and attention is paid to the research and management of management methods and management theories such as current social production and operation [1].

China established and developed the discipline of management science and engineering in the middle of the 20th century, and with the continuous progress of the times, the discipline has been rapidly improved and developed, covering a variety of sub-discipline systems, and it is a comprehensive discipline with strong application. At the same time, China's long history has created good conditions for the progress of modern management science and engineering disciplines, and has brought a profound impact.

3 Development status of management science and engineering discipline

3.1 Information management and industrial engineering

The disciplines of management science and engineering cover a wide range, and their application in information management and engineering has further promoted the development and progress of the information industry. In the field of industrial engineering, scientific researchers can combine social science, natural science, and engineering analysis and design methods to conduct research and analysis on various resources and energy and the related equipment, and carry out reasonable allocation and effective research of resources based on the principle of maximizing resource benefits. At the same time, it has further strengthened the design and improvement of the scientific management system of industrial enterprises,

creating good conditions for the sustainable and stable development of industrial enterprises in China [2]. Secondly, management science and engineering are also widely used in other links related to industrial engineering, such as production planning management, technical decision-making, financial management, system design, management services, system optimization, quality control management and other related fields. In the research process of information management industrial engineering, under the guidance of modern science and technology, the centralized collection, storage, management and application of various enterprise information data can further accelerate the integration of

enterprise information resources, improve the efficiency of the use of corporate resources, so as to more accurately predict the development prospects and development directions of the company, adjust the company's business and production strategies in time, and promote the transformation and upgrading of the company. In addition, in the field of management science and engineering, research directions such as mobile device commerce, intelligent commerce, online e-commerce, and information development and sorting have also achieved remarkable achievements, bringing new vitality to the development of industrial enterprises in China [3].

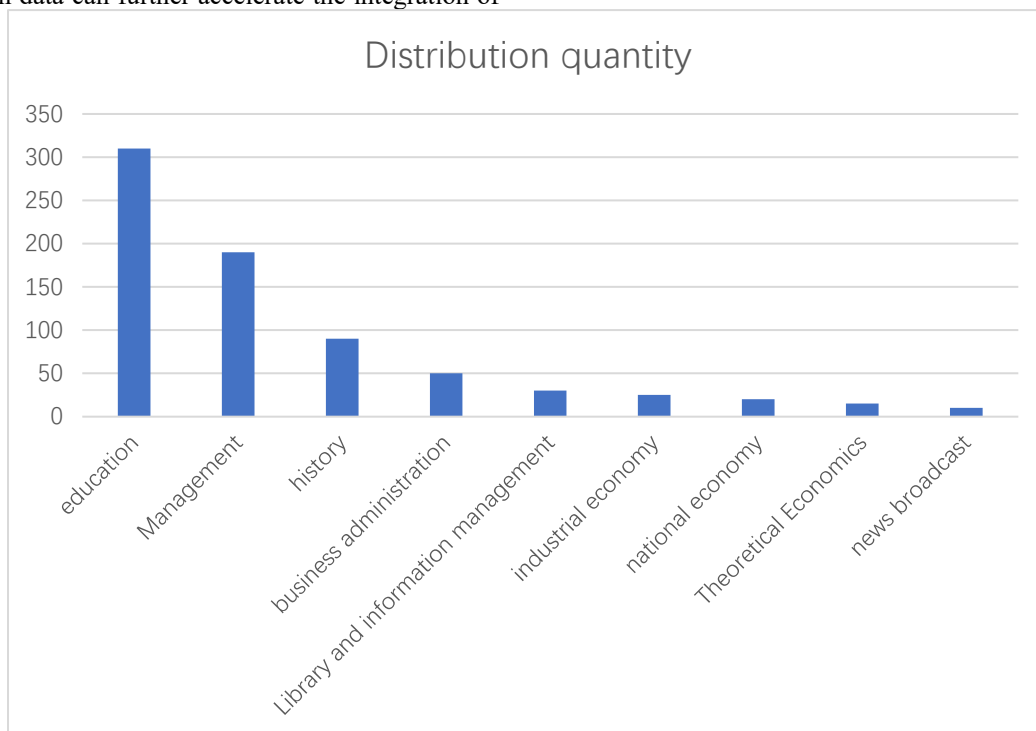


Fig 1. Discipline distribution data display

3.2 Power engineering

With the rapid development of social economy, China's social power consumption is rising rapidly, and the requirements for the stability and safety of power supply are also getting higher and higher. At present, China has solved the problem of power generation demand, but the process stability of the power network has always been a key issue restricting the sustainable development of its power enterprises. The power system includes intermediate transformer equipment, power generation equipment and load equipment and other related parts. Affected by the surrounding environment, the power consumption of load equipment and transformer equipment is relatively complicated. In the process of actual use, it will inevitably be affected by some factors and cause unstable operation, which is not conducive to the sustainable development of power enterprises. At the same time, as the power network system becomes more and more complex, the difficulty of power operation and maintenance is also increasing, and the original power management and operation plan can no longer meet the needs of the current power system operation. Therefore,

the combination of management science and engineering disciplines with modern computer technology can systematically reduce the difficulty of power maintenance and operation, improve the quality and stability of power system operations, promote the rational distribution of power resources, and improve the stability of the overall supply of power networks [4].

3.3 Logistics and supply chain management

With the continuous development and progress of e-commerce transactions, logistics and supply chain management as a new practical knowledge system and management thinking model have achieved rapid development. The quality and efficiency of logistics and supply chain management are directly related to the development prospects and trends of China's e-commerce industry. With the further strengthening of economic globalization, development and integration are the most critical development trends in our society. At the same time, the cost of human resources is getting higher and higher, which also brings certain pressure on logistics and supply chain management. Therefore, logistics enterprises need to actively integrate the relevant knowledge and

theoretical systems of management science and engineering disciplines to improve the core competitiveness of logistics enterprises, so that logistics enterprises can survive and develop stably in the fierce market competition^[5].

3.4 Highly overlapping and fusion of knowledge

As a cross-integrated discipline, the discipline of management involves a wide range of knowledge and runs through the development of the enterprise. Mathematics, behavioral science and economics are the foundation of the discipline of management. With the continuous improvement of modern education and teaching systems, theoretical systems such as matrix theory, functional analysis, fuzzy mathematics, relative random processes, and time series have been widely introduced in major college management courses. At the same time, the application of system thinking and system theory in management science and engineering has also been deepening. The analysis of management problems with system theory and system methods has become a major trend in the current management field, which can comprehensively reflect the integrity of management problems. What's more, cybernetics, operations research, information theory, statistics and other related discipline tools have also created good conditions for revealing the laws of management problems. Various complex theoretical systems developed on this basis, including synergy theory, dissipative structure theory, thermodynamic entropy change theory, and catastrophe theory, are widely used to reveal the laws of non-linear and complex phenomena, and their application value in management science become higher. Figure 1 shows the contemporary management science and engineering discipline system^[6].

4 Issues in the development of management science and engineering disciplines

4.1 Problems of talent cultivation in the discipline

The development prospects and trends of the disciplines are directly related to the quality and efficiency of talent cultivation in management science and engineering disciplines. Judging from the actual situation of the current university management science and engineering courses, there are still many problems and shortcomings, which affect the quality of relevant talent cultivation in China and cannot meet the needs of social development. First of all, from the point of view of universities and teachers, problems of insufficient professional and practical ability of teachers and irregular development of professional courses have appeared in the discipline. With the continuous development of social economy and the gradual increase of market demand, the number of management disciplines and professional students has shown a trend of increasing year by year, which has also

brought greater pressure to the teaching work of teachers^[7]. In order to complete the teaching task in time, professional teachers often neglect the cultivation of students' practical ability and pay too much attention to theoretical teaching. Many students do not really enter the practical operation until the end of the study. Secondly, because management science and engineering majors have received more and more attention from our society, many unqualified universities have also opened a large number of management science and engineering majors, and the lack of standardized curriculum systems and curriculum standards for training students has led to differences between universities. There is a big difference between management science and engineering talent training. In addition, in the process of talent training, colleges and universities also generally suffer from unclear training goals and lack of innovation and comprehensiveness in teaching. Many universities' training positions for relevant talents can only meet the minimum standards of China's higher education, and it is difficult to meet the market environment. The actual demand of undergraduates has caused great pressure on the employment of undergraduates. In the teaching process, the curriculum design also lacks complex and systematic, generally lacks creative training, and the students' practical ability and practical operation ability are seriously insufficient^[8].

4.2 Imbalance between discipline and major construction

At present, more attention is paid to scientific research in the construction of management science and engineering disciplines, but in the process of major construction, more attention should be paid to talent cultivation. Discipline construction tends to the scientific research and pursue its own development, while ignoring the needs of talent cultivation. The results and effectiveness of the construction are stronger, so it is easier to get the attention from the university, but the major construction should pay more attention in talent cultivation. Compared with discipline construction, major construction has the characteristics of lagging and recessiveness, which causes universities to generally attach importance to discipline construction but ignore major construction. Therefore, there is a serious imbalance in the effectiveness of discipline and major construction. Discipline construction can lead to the forefront of academics, making more attention paid to knowledge discovery and innovation and high-level results, which are closely related to the reputation and influence of the university. However, it is also necessary to pay more attention to the training of professional talents, which is also the foundation of the sustainable development of universities. Therefore, it is necessary to correctly recognize the problems in the process of professional construction of management science and engineering disciplines, and reasonably coordinate the imbalances existing in the construction of disciplines and majors.

5 Empirical analysis of the development of management science and engineering disciplines

5.1 Optimizing the resources of management science and engineering

In the process of the construction and development of management science and engineering, it is first necessary to further strengthen the optimization of discipline-related resources, and strive for more resources and advantages. At the same time, it is necessary to rationally allocate limited resources, combine the ever-changing market environment and the development trend of the country and society, highlight the efficiency and quality of talent training, and continuously optimize resources. Secondly, it is necessary to strengthen the adjustment of related training structure, including professional faculty structure, subject structure and overall structure of students, so that

the development of management science and engineering can keep pace with the times, keep pace with society, and better satisfy society's demand for talent. In addition, it is necessary to strengthen the innovation and optimization of teaching models, pay more attention to the development of students' practical ability and comprehensive ability, and improve the quality of education and teaching. The model of credit system can be widely used in the construction of management science and engineering disciplines to improve the teaching-related scoring system with people-oriented teaching activities, and cultivate students' innovative spirit and independent thinking ability. Teachers also need to continue to carry out innovative research on teaching methods and teaching processes, and stimulate students' interest and initiative in learning. Computer technology and modern intelligent technology should be widely introduced into the teaching process of management science and engineering education, reforming traditional teaching methods.

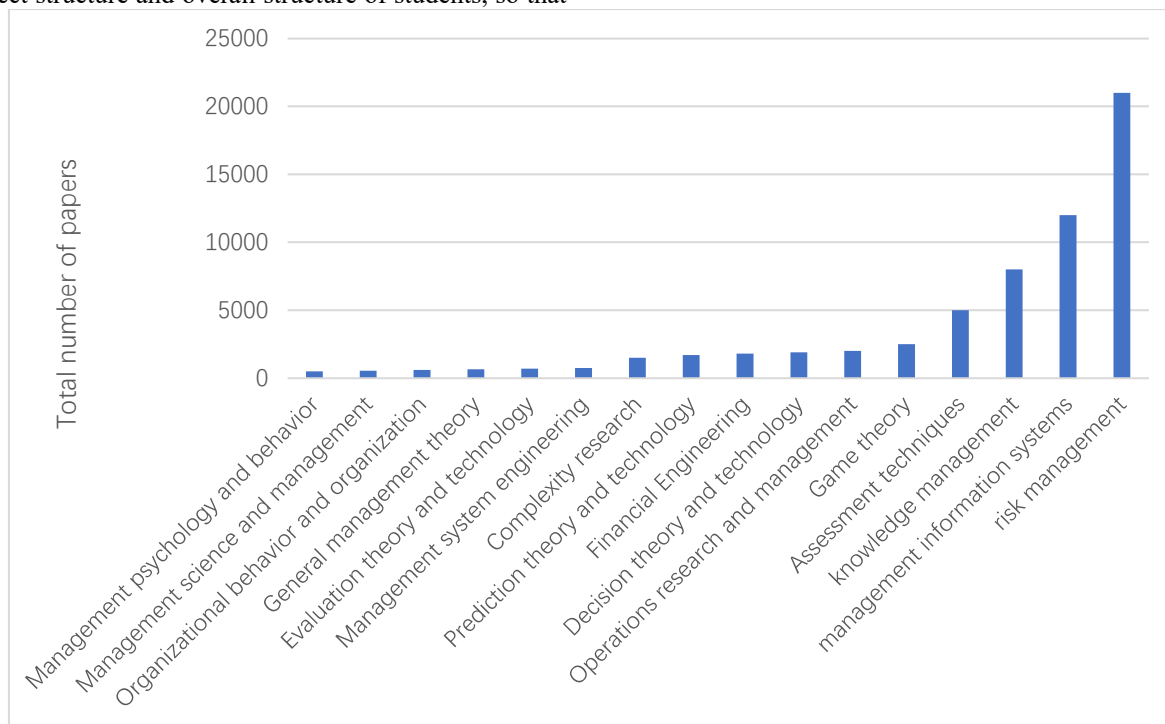


Fig 2. The total number of papers from 2001 to 2019

5.2 Strengthening interdisciplinary efforts

With the continuous development of our time, the disciplines of management science and engineering need to be continuously improved and optimized accordingly. At the same time, it is also necessary to further accelerate the process of integration and intersection with other disciplines. Interdisciplinary integration has greatly enriched the content of management science and engineering itself, while also providing unlimited possibilities for the research and development of disciplines. What's more, strengthening the interdisciplinary strength can also promote the development and construction of other disciplines and other fields, creating foundations for the development of other industries and providing sufficient driving force.

And based on this, it can promote the reform and innovation of China's overall discipline industry, and inject more energy into the progress and development of traditional disciplines and new disciplines of engineering discipline management in China.

5.3 Improving the level of discipline management research

The overall system of management research is relatively complex and is a self-organizing system with open and comprehensive characteristics. From the perspective of application fields, management science and engineering are very broad. In the process of development, it is necessary to gradually strengthen the integration and absorption of relevant subject knowledge. Management research has been developed and born in the collision and

debate with other various arguments. It can enrich and improve various theories, methods and research methods, and improve people's ability to understand, solve and discover problems. At the same time, in the process of rich and diverse subject research, it can also further promote the development and innovation of other subjects, but people need to strengthen the research of the foresight work of subject theory to create good guidance for the further improvement of management research. In the face of complex and in-depth issues related to the national economy and the reform of state-owned enterprises, it is also necessary to use management science and engineering disciplines in the exploration and analysis of the problems to formulate a management theory system with Chinese characteristics according to the actual situation of China's current social and economic development and the problems in the market environment.

6 Conclusion

In conclusion, the development and construction of management science and engineering disciplines have a very important impact on the sustainable and stable development of China's social economy. With the continuous research and improvement of the theoretical system, China's management science and engineering has become a set of discipline with complete knowledge and theories, and has made considerable progress in the long-term practice. However, from the perspective of the actual development process of the discipline, there are still certain problems and shortcomings, which affect the continuity and effectiveness of the discipline construction. Therefore, it is necessary to strengthen the exploration of management science and engineering disciplines, and to promote the sustainable development of China's management science and engineering disciplines through systematic and complete intervention strategies.

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