

Chinese Government's Science and Technology Management Policy in Cultural Field (1978-2018)

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Abstract—Since 1978 to 2018, China's cultural and scientific work has gone through six stages. The first stage was marked by Deng Xiaoping's assertion that "four modernizations, the key is the modernization of science and technology" in 1978; the second stage was marked by the concept of "science and technology is the primary productive force" in 1988; the third stage is marked by the "Rejuvenating the country through science and education" strategy in 1995; the fourth stage is marked by the establishment of the concept of "cultural industry" in 2003; The fifth stage was marked by the publication of the "Rejuvenation Plan for Culture Industry" and the concept of "cultural and scientific integration"; the sixth stage was marked by the innovation drive strategy of General Secretary Xi Jinping of the 18th session of the Third Plenary Session.

Index Terms—Cultural science and technology management, cultural and technological integration, Cultural industries, Cultural and technological policy

I. INTRODUCTION

Since the 18th National Congress of the Communist Party of China, the government have made a series of arrangements around the innovation-driven strategy. In order to further promote technological innovation in the cultural field, in April 2017, the Ministry of Culture released the Cultural and Technological Innovation Plan of the Ministry of Culture during the 13th Five-Year Plan period. In 2020, it is proposed that the construction goal of the cultural science and technology innovation system will be market-oriented, demand-driven, application-driven, and cultural and technological enterprises as the mainstay of technological innovation[1]. This study sorts out the policies related to cultural science and technology (S&T) management since 1978, and give suggestions to cultural S&T management in China.

II. SIX STAGES OF S&T MANAGEMENT IN THE FIELD OF CULTURE

The S&T management reform in China's cultural field can be divided into six stages. The first stage was marked by Deng Xiaoping's assertion that "four modernizations, the key is the modernization of S&T" in 1978; the second stage was marked by the concept of "S&T is the primary productive force" in 1988; the third stage is marked by the "Rejuvenating the country through science and

education" strategy in 1995; the fourth stage is marked by the establishment of the concept of "cultural industry" in 2003; The fifth stage was marked by the publication of the "Rejuvenation Plan for Culture Industry" and the concept of "cultural and scientific integration"; the sixth stage was marked by the innovation drive strategy of General Secretary Xi Jinping of the 18th session of the Third Plenary Session.

A. Technology Has Become an Important Driving Force for Cultural Development

From 1978 to 1988, the S&T management in the cultural field was at the stage of exploration. Under the conclusion of "four modernizations, the key is the modernization of S&T"[2], the S&T management of the cultural system began. The initial work of cultural S&T management was generally to serve the state's S&T management. From 1988 to 1995, the S&T management system in the cultural field continued to improve. Under the guidance of the idea that "S&T are the primary productive forces"[3], the S&T has become an important productive force for cultural development.

B. The Unity of Culture and S&T is Clearly Defined

From 1995 to 2003, the S&T management system in the cultural field began to deepen. In 1995, the National S&T Conference put forward the strategy of "rejuvenating the country through science and education". For the first time, the conference proposed "strengthening S&T work in the fields of culture and sports", and the unity of culture and technology was further clarified [4].

C. Industrialization Drives Cultural S&T Management

From 2003 to 2009, the S&T management work in the cultural field was driven by industrialization. In 2003, the Central Political Bureau launched the seventh collective study [5], which clarified the formulation of the cultural industry [6]. The Fourth Plenary Session of the 16th Central Committee of the Party further proposed "deepening the reform of the cultural system and liberating and developing cultural productivity" [7]. The goal of cultural S&T management is more clear.

D. Integration of Culture and Technology Has Become an Important Goal

From 2009 to 2013, the cultural science and technology management work has further developed by leaps and bounds. The power of cultural and

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technological integration and development has become stronger. The financial crisis in 2008 has made the world more emphasis on technological innovation. Cultural and technological innovation has become a weapon to overcome the financial crisis[8]. The "Cultural Industry Revitalization Plan" proposes that "cultural and creative industries should focus on the development of enterprises such as culture and science, music production, art creation, animation and games, and promote the development of related service industries and manufacturing industries." [9] Cultural S&T management undertakes the important task of driving the development of related industries.

E. Innovation Drive to Promote Diversification of S&T Management

After 2013, under the guidance of the "innovation-driven" thinking, cultural and technological integration has become the core content of a series of important policy documents. At this stage, cultural S&T management has shown a diversified development trend. Under the drive of new technology development and capital power, management objects, methods and objectives have become diversified.

III. THE IMPACT OF TECHNOLOGICAL PROGRESS ON THE MANAGEMENT OF CULTURAL S&T

How to apply new technologies to the cultural field and promote the continuous development of cultural undertakings and cultural industries is one of the core tasks of cultural S&T management. The progress of S&T progress has become a very important factor affecting the management of cultural S&T.

A. Stage of Automation Development

This stage can be divided into two stages, namely, the stage of technological innovation and the stage of popularization of technology. From 1978 to 1988, the Ministry of Culture carried out four "Cultural and Scientific Achievement Awards" [9]. At this stage, there are two aspects of S&T that have attracted much attention. One is printing technology and the other is library automation management technology. The original cultural S&T management is concerned with printing technology, Beijing Xinhua Printing Factory research completed 'microsphere and its application technology'" [10], Beijing Library's "Chinese character attribute dictionary" have been rewarded and supported. After 1988, automation technology began to be popularized and promoted. There is an Influential result at this stage. It is the Library Automation Integration System (ILAS) supported by the Ministry of Culture in 1988 and studied by the Shenzhen Library.[11] During the Eighth Five-Year Plan, more than 300 libraries have used the system. The system began development of version 2.0 in 1998 and won the first prize of the Ministry of Culture for S&T Progress in 1999[12].

B. Network Development Stage

In 1995, "more than 60 libraries in the world have become full members of the INTERNET International Network and entered the remote networking to share literature resources." The object of the Cultural S&T Progress Award began to move to networking. The target of cultural and scientific achievements rewards at this stage is mainly network technology. For example, the Beijing Concert Hall achieved internal intranet ticket sales in 1994, and launched the 'Sunday Ticketing Online' system in May 1997, which created enormous social and economic benefits[13]. The Outline of the Tenth Five-Year Plan for the Development of Cultural Enterprises has proposed the construction of cultural information for the first time[14]. In 1998, the National Key S&T Project "National Cultural Management Information System Research and Development" filed by the Ministry of Culture was approved by the State Planning Commission[15]. In 2002, the Ministry of Culture and the Ministry of Finance jointly organized the implementation of the "National Cultural Information Resources Sharing Project" [16].

C. Diversified Development Stage

The Culture and Related Industries Classification (2012) was revised on the basis of the 2004 version. In this version of the cultural information transmission service industry, cultural software services include multimedia, animation game software development, digital animation, game design and production. The development of animation and other industries has further promoted the application of multi-technology in the field of culture. Cloud computing, mobile Internet big data, virtual reality and other technologies have brought the power of cultural development.

IV. THE MARKET POWER OF CULTURAL S&T MANAGEMENT WORK

Cultural S&T innovation requires huge investment. Only by making good use of the power of the market can the cultural S&T management work form a strong synergy of S&T innovation. In terms of market-oriented promotion, the management of cultural S&T has shifted from the initial promotion of cultural and scientific achievements to the development of cultural and technological industrialization.

A. From Attaching Importance to Evaluation to Paying Attention to the Transformation of Cultural and Scientific Achievements

In addition to the collection and evaluation of the achievements, the management department also attaches great importance to the transformation of cultural and scientific achievements. On June 9, 1986, the Ministry of Culture and the Ministry of Radio, Film and Television jointly organized the "National Cultural S&T Achievements Exhibition and Technology Fair". The exhibition was divided into four exhibitions: film,

publishing, art, and cultural relics. There were more than 500 exhibits.

B. The Integration of Science, Industry and Trade Promotes the Commercialization of Cultural and Scientific Achievements

Driven by cultural and technological management policies, the pace of cultural commodification and industrialization has accelerated. In 1995, Jiao Lisen first mentioned the commercialization and industrialization transformation of cultural and scientific achievements [17]. Xie Rui believes that "the cultural S&T industry should be vigorously developed" [18]. There are many cultural S&T research institutes that are taking the road of integration of science, industry and trade, and their achievements are outstanding.

C. Enterprises Become the Main Body of Marketization

On May 15, 1996, at the 19th meeting of the Standing Committee of the Eighth National People's Congress, the Law of the People's Republic of China on Promoting the Transformation of S&T Achievements was adopted. Article 5 stipulates that "the State Council and local people's governments at various levels shall incorporate the transformation of S&T achievements into the national economic and social development plan." Articles 17 and 18 respectively propose "the main status of forming enterprises to transform S&T achievements", "developing technology markets, and promoting the transformation of S&T achievements."

D. From Focusing on Achievement Management to Environment Construction

With the advancement of marketization, the management of cultural S&T has entered a new stage. It is mainly manifested in the emergence of S&T culture city, S&T cultural industry base, cultural and creative industrial park, and the rise of large-scale cultural and technological enterprises. In 2004, Pudong New Area United Nations Department of Culture Art Service Center, Shanghai Theatre Academy and other units officially launched the construction of cultural S&T creative industry base. The Cultural S&T Park of Renmin University began to explore the industrialization transformation path of humanities and social sciences achievements, providing space for cultural enterprise incubation. The birth of a variety of cultural and technological industrial parks and industrial bases provides a better grasp and platform for cultural S&T management.

V. INNOVATION AND CHANGE OF THE SYSTEM OF CULTURAL S&T MANAGEMENT MECHANISM

A. The Functions of Cultural S&T Management Institutions are Increasingly Diverse

The Ministry of Culture established the "Technology Office" in 1977, which is responsible for the collection of cultural and scientific achievements. On this basis, the S&T Bureau was established in 1979. In October 1980, the Ministry of Culture discussed and approved the

"Implementation Rules for the Ministry of Culture S&T Progress Awards" proposed by the S&T Bureau. In order to ensure the scientific nature of the award process, the S&T Committee of the Ministry of Culture was established in 1983.

In 1994, the reform of state institutions promoted "simplification of institutions. The Ministry of Culture added a new institution, the S&T Department, to incorporate the work of cultural and social science research (art theory research) into the management of the S&T Division.

In 1998, the Department of Education and the Department of S&T of the Ministry of Culture merged into the Department of Education and Technology [19]. At this stage, the integration of art and technology, the development of cultural and technological information, the industrialization of cultural and scientific achievements, and the growth of demand for cultural and scientific talents are becoming more and more obvious. The merger also made the function of cultural S&T management pay more attention to basic scientific research [20].

B. The Funding Channels for Cultural S&T Management are Constantly Expanding

How to mobilize various funds to promote the production and transformation of cultural and scientific achievements is an important task in the management of cultural S&T. The Ministry of Culture implements the "Decision of the Central Committee of the Communist Party of China and the State Council on Accelerating the Progress of S&T" and proposes the future development of cultural S&T management, including "establishing cultural and technological development funds, developing cultural and technological industries, implementing cross-century talent projects, and formulating good culture. S&T "Ninth Five-Year Plan" and 2010 Long-Term Planning" [21]. In order to further raise funds and seek ways to generate greater benefits, the Ministry of Culture began to build a "Cultural S&T Development Fund". In addition, the Ministry of Culture has also clearly stated that "we strive to invest about 1% of the cultural undertakings each year to support cultural S&T research and change the situation in which the Ministry of Culture does not have special research funding." With the advancement of the industrialization process, the capital demand for cultural S&T management work has continued to grow, and the construction of a multi-level and multi-level capital market has become the focus of promoting the development of cultural S&T work.

C. Cultural and Scientific Management Pays More Attention to Basic Research

With the improvement of the cultural S&T management system, two teams have been formed, namely the cultural S&T management team and the cultural research team [22]. By 1995, there were 22 provinces in the Ministry of Culture (the Bureau) set up the Science and Education Department (some places called the S&T Book Office), 12 cultural S&T research institutes, and the full-time research team reached more

than 300 people. In 2011, the social science fund's major project "Research on the Internal Mechanism and Strategic Path of Cultural and Technological Integration and Innovation" was established [23]. In 2012, the policies and research related to cultural S&T integration began to explode after Li Changchun investigated Guangdong. Cai Wu pointed out that "the continuous expansion of cultural and technological integration and innovation has added a new and stronger driving force for the development of cultural industries[24]." Wang Zhigang proposed "implementing cultural S&T innovation projects and strengthening the integration of culture and technology"[25]. The term "integration of culture and technology" was also published in the People's Daily[26]. In the same year, Guangming Daily also listed "culture and technology integration" as an important subject of the cultural industry [27].

D. The Awards for the Management of Cultural and Scientific Achievements are More Abundant

With the improvement of the cultural S&T management system, the awards for cultural and scientific achievements have become increasingly abundant. In 1988, the Cultural S&T Achievement Award was changed to the Cultural S&T Progress Award[28]. With the promotion of industrialization, cultural and scientific management work pays more attention to the two-way innovation drive of culture and technology. At this stage, scholars have used the terms "combination", "marriage", "interaction" and "integration innovation". Technological innovation has become the wings of cultural development"[29]. In 2004, the Ministry of Culture set up an Innovation Award. In 2009, with the support of the Ministry of Finance, the "National Cultural Innovation Project" was launched. In the same year, the Ministry of Culture also promulgated the "Management Measures for S&T Innovation Projects of the Ministry of Culture (Provisional)". In 2010, the National Culture and Technology Promotion Program was launched. In July 2011, the Ministry of S&T and the Ministry of Culture held the first working meeting of the Ministry of Education. The two ministries and commissions began to jointly promote the 'Technology and Culture Integration Demonstration Base'. In May 2012, the National Cultural S&T Innovation Project was officially launched.

VI. POLICY RECOMMENDATIONS FOR FURTHER PROMOTING THE DEVELOPMENT OF CULTURAL S&T

A. Increase Support for Research and Development and Application of New Technologies

The object of cultural S&T management is not only relying on financial input can not meet the development needs of cultural S&T management, and it is necessary to introduce more social capital. With the establishment of various cultural industry support funds, cultural and technological development has a better funding channel, establishes the capital awareness of cultural S&T management work, and establishes various cultural S&T funds to attract more social capital to participate in PPP.

The work of cultural S&T projects can provide better support for cultural S&T management.

B. Pay More Attention to the Promotion of Science and Technology to the Industry

Internet technology has brought about a revolution in the way of communication. At the same time, it has greatly expanded the space for the development of excellent traditional culture. The role of promoting cultural and scientific services to promote public cultural services and promote the development of traditional culture is becoming stronger. The integration of culture and technology is an excellent tradition. The important means of culturally innovative production and creative transformation, cultural and scientific management departments should support the protection, inheritance and utilization of excellent traditional culture through various means.

C. Strengthening Capital Awareness in Cultural S&T Management

From 1995, the Ministry of Culture proposed 1% of the business expenses to support cultural S&T, and increasing capital investment in cultural S&T has always been an important issue. However, relying solely on financial input is unable to meet the high-speed development needs, and more social capital needs to be introduced. With the establishment of various cultural industry support funds, cultural and technological development has a better funding channel, establishes the capital awareness of cultural S&T management work, and plugs the financial wings for the development of cultural S&T. Establish various cultural S&T funds, strengthen the management of funds, attract more social capital to participate in relevant cultural and scientific projects in the form of PPP, such as information technology, big data and other projects, can further promote the development of cultural S&T and support the cultural S&T Management work.

D. Strengthening the S&T Support for Excellent Traditional Culture

Internet technology has brought about a revolution in the way of communication, and at the same time has greatly expanded the space for the development of excellent traditional culture. With the advancement of cultural S&T management, the role of promoting cultural and scientific services through public cultural services and promoting the development of traditional culture through culture and technology is becoming more and more important. The integration of culture and technology is an important means of innovative production and creative transformation of excellent traditional culture. Under the background of the country's strong support for the development of excellent traditional culture, the cultural S&T management department should assume more and more important responsibilities and support the protection, inheritance

and utilization of excellent traditional culture through various means.

E. Paying Attention to the Basic Theoretical Research of Culture and Science

In order to further promote the scientific management of cultural S&T, it is necessary to further increase support for the basic theoretical research of cultural S&T, international comparative research, and comparative study of policies, and promote the management of cultural S&T to a higher level through basic theoretical research.

F. Paying Attention to the Cultivation of Cultural and Scientific Talents

As the country vigorously develops the digital cultural industry and vigorously promotes the development of cultural big data, the demand for talents will show a sharp growth trend. In order to adapt to these new demands, more institutions need to be supported to cultivate cultural and technological composite talents.

Looking back on the course of China's 40 years of cultural and technological development, it has achieved very remarkable results, and the cultural S&T management system has become more and more perfect. However, under the ever-changing technological development background, cultural and technological management has more room for development and progress in the increasingly fierce international competition environment.

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