

Conservation and Communication Strategy for the Grand Canal Cultural Heritage with the Theoretical Framework of 5Cs

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Abstract: Since ancient China, the Grand Canal has become the backbone of the nation, exerting profound and far reaching influence on Chinese communication and transportation system. Studies concerning the Grand Canal have increased greatly since it entered into the World Heritage List in 2014. However, most researches are focused upon practical issues, such as repairing or restoring relative river canals, scenery spots and museums. Under the more complex and serious conditions of world ecosystem and cultural conflicts, more research work is needed to enhance the theoretical understanding for the Grand Canal and promote the Grand Canal Cultural Heritage globally, aiming to build a community of shared future for mankind. With the guidance of "5Cs" of *Operational Guidelines for the Implementation of the World Heritage Convention*, this paper discusses better conservation and communication strategies for the Grand Canal by highlighting its outstanding universal value, improving its credibility with scientific conservation of the authenticity and integrity of the Grand Canal, focusing on capacity-building for better convention and application of the cultural heritage resources and encouraging social communities to work together for the global communication of the Grand Canal. Meanwhile, a multi-modal and multilingual database for the historical and cultural resources of the Grand Canal will be established by means of big data, digital technology and all-media technology. It is hoped to provide meaningful reference for the more rational and scientific conservation and communication of the Grand Canal while China is planning to build the National Grand Canal Cultural Park.

Keywords: The Grand Canal, Conservation, Communication, World Heritage, 5Cs

1. The Global Significance of the Grand Canal Cultural Heritage

The Grand Canal is the oldest and longest canal in the world, which was excavated 2,500 years ago in China. It has been listed as the most influential waterway by the International Commission for the Protection of Industrial Heritage in the List of International Canal Monuments. The Grand Canal demonstrates the great wisdom and courage of the Chinese people. With the long history and civilization of the Chinese culture, it is like a magnificent poem written on the land of China. On June 22, 2014, the Grand Canal of

China was officially listed in the World Heritage List, signifying its global importance.

According to the UNESCO's official website (<http://whc.unesco.org/en/list/1443>, 16:19, July 24, 2019), the Grand Canal, a vast waterway system in the north-eastern and central-eastern plains of China, runs from Beijing in the north to Zhejiang province in the south. Constructed in sections from the 5th century BC onwards, it was conceived as a unified means of communication for the Empire for the first time in the 7th century AD (Sui dynasty). This led to a series of gigantic construction sites, creating the world's largest and most extensive civil engineering project prior to the Industrial Revolution. It formed the backbone of the

Empire’s inland communication system, transporting grain and strategic raw materials and supplying rice to feed the big population from the south to the north of the country. By the 13th century it consisted of more than 2,000km of artificial waterways and linked five of China’s main river basins. It has played an important role in ensuring the country’s economic prosperity and stability. It is still in use today as a major means of transportation.

The Grand Canal is also the canal of the world. In Beiyong Village, Dezhou, Shandong Province, there are two families named An and Wen. Influenced by Zheng He's voyage to the Western Ocean in the early 15th century, the descendants of King Sulu came to pay homage to the big shipbuilding country and settled down there ever since. In Montreal, Canada, there is a "China City", where a "China Canal" flows down, which is the French imagination 300 years ago to dredge the river to carry out trade exchanges with China. Marco Polo, Matteo Ricci, Cui Pu and other foreign navigators, missionaries, diplomatic envoys and scholars have left many records about the Grand Canal. The canal in their maps of China is clear at a glance, showing the cultural impression of the Oriental Canal.

Since the Grand Canal entered the World Heritage List in 2014 (please see Table 1 for the detailed information), the

Chinese government has spent a lot of time and effort to promote the national strategy of constructing the Grand Canal Cultural Belt. Think tanks and research institutes (centers) have been set up in provinces and cities along the Canal; Museums, cultural parks and scenery spots related to the Grand Canal have been established.

In 2017, Chinese President Xi Jinping made two important comments on the conservation of the cultural heritage of the Grand Canal. He pointed out that "it is the common responsibility of all regions along the Grand Canal to investigate into the historical and cultural resources" and stressed that "the Grand Canal, as a flowing culture, is a precious heritage left by our ancestors, which should be well protected, inherited and utilized as a whole". In *The Grand Canal Culture of China*, Jiang Shili argues that the Grand Canal culture is the integration of material and intangible cultural heritage and ideological thoughts, formed by the rise of canal cities, the prosperity of literature and art, the participation of different cultural backgrounds which were brought by the development of the canal economy [12]. "It involves cultural relics, heritage, history, landscape, art, literature, architecture, planning, archaeology, economy and many other fields. "The number is very vast and we can only name a few here, as shown in Table 2.

Table 1. The Grand Canal World Heritage List.

Province/City	City	River Channels (27)	Heritage Sites (58)
Beijing4 (2+2)		1. Old Beijing Section of the Tonghui River 2. Tongzhou Section of the Tonghui River	Wanjing Bridge Dongbuya Bridge
Tianjin 1		Tianjin Section of the Grand Canal	
	Suqian 2 (1+1)	Suqian Section in the middle of the Grand Canal	Temporary Imperial Palace at Long Wang Temple Qingkou Hub ShuangjinWate Gate Qingjiang Water Gate Hongzehu Dike Ruins of Governor’s Water Transport Office Liubao Water-reducing Water Gate Yucheng Post Shaobo Dike Shaobo Jetty Slender West Lake Temporary Imperial Palace at Tianning Buddhist Temple, Ge Yuan Wang Lumen Residence God of Salt Temple Lu Shaoxu Residence
	Huai’an 6 (1+5)	Huai’an Section of the Huai-Yang Canal	
Jiangsu 28 (6+21)	Yangzhou 10 (1+9)	Yangzhou Section the Huiyang Canal	
	Changzhou 1 Wuxi 2 (1+1)	Changzhou Section of Jiangnan Canal Wuxi Section of Jiangnan Canal	Qingmingqiao Historical and Cultural Street Panmen Baodai Bridge Shantanghe Historical and Cultural Street Pingjiang Historical and Cultural Street Wujiang Track Road Xiejia Dike Huajiakou Rammed Earth and Dangerous Section
	Suzhou 6 (1+5)	Suzhou Section of Jiangnan Canal	
	Cangzhou 2 (1+1)	Cangzhou-Dezhou Section of the South Canal	
Hebei 3 (1+2)	Hengshui 1 Zhengzhou 1	Zhengzhou Section of Tongji Canal (Bianhe River)	
	Luoyang 2		Ruins of Luoyang Huiluocang Granary Ruins of Luoyang Hanjiacang Granary
Henan 7 (4+3)	Hebi 2 (1+1) Shangqiu 2	Huaxian-HebiXunxian Section of Yongji Canal (Weihe River) ShangqiuNanguan Section of Tongji Canal (Bianhe River) ShangqiuXiayi Section of Tongji Canal (Bianhe River)	Ruins of XunxianLiyang Granary

Province/City	City	River Channels (27)	Heritage Sites (58)
Shandong 23 (8+15)	Jining 11 (3+8)	Nanwang Hub Section of Huitonghe River; Xiaowenhe River; Weishan Section of Huitonghe River.	Nanwang Key Water Control Hub
			Ruins of Long Wang Temple at Nanwang Branch
	Zaozhuang 1	Taierzhuang Section of the middle canal	Brick Dike of the Canal
			Xingtong Canal Offlet
	Handan 1	Dezhou Section of the south canal	Xujiankou Canal Offlet
			Shili Water Gate
	Dezhou 1	Linqing Section of Huitonghe River (Yuanlianhe River)	Siqianpu Water Gate
			Lijian Water Gate
	Linqing 3 (2+1)	Linqing Section of Huitonghe River (Xiaoyunhe)	Chaoguan of Linqing Canal
			Jingmen Upper Water Gate
Jingmen 2	Yanggu Section of Huitonghe River	Jingmen Lower Water Gate	
		Acheng Upper Water Gate	
Liaocheng 3 (1+2)	Tai'an 1	Acheng Lower Water Gate	
		Daicun Dike	
Anhui 2 (1+1)	Suzhou 1	Sixian Section of Tongji Canal	Ruins of Liuzi Canal
			Huaibei 1
Hangzhou 6 (1+5)	Jiaxing-Hangzhou Section of Jiangnan Canal	Fuyi Granary	
		Gongchen Bridge	
Zhejiang 18 (4+14)	Shaoxing 5 (2+3)	Xiaoshan-Shaoxing Section of Zhedong Canal	Qiaoxi Historical Street
			Shangxu-Yuyao Section of Zhedong Canal
	Haining 1	Ningbo Section of Zhedong Canal	Shaoxing Track Road
			Shangxu-Yuyao Section of Zhedong Canal
	Jiaxing 1	Ningbo Section of Zhedong Canal	Baziqiao
			Ruins of Chang'an Water Gate
	Huzhou 1	Ningbo Section of Zhedong Canal	Changhong Bridge
			Nanxun Ancient Town
	Ningbo 4 (1+3)	Ningbo Section of Zhedong Canal	Guangji Bridge
			Qing'an Guild
			Ningbo Sanjiangkou

Table 2. Historical and cultural resources along the Grand Canal.

English title	Chinese title
Official historical records of the Grand Canal, such as <i>Records of Canals</i> , <i>Records of Irrigation Ditch</i> , <i>Records of Geography</i> , <i>Records of Food and Goods</i> and etc	《河渠志》《沟洫志》《地理志》《食货志》等有关运河的历史记载。
Poems and essays about relative to the Grand Canal	运河诗文
Novels, such as <i>A Dream of Red Mansions</i> , <i>The Good Earth</i>	运河边的小说, 如《红楼梦》、《大地》
Operas, such as <i>The West Chamber</i>	运河边的戏曲, 如《西厢记》
Folk songs & ballads, such as <i>Jasmine</i> , <i>Picking Red Caltrop</i>	运河边的民歌民谣, 如《茉莉花》、《采红菱》
Legends, such as <i>White Snake</i> , <i>Four Kings of Golden Dragon</i> and <i>The Seventh Fairy</i>	运河边的传说故事, 如白蛇传、金龙四大王、七仙女
Maps, such as Yu Xiang Map	运河边的地图, 如禹祥图
Paintings, pictures, recordings, videos, etc., such as <i>Riverside Scene at Qingming Festival</i> , <i>The Grand Canal</i> (TV Documentary)	运河边的绘画、图片、录音、录像等, 如清明上河图、话说运河

XunDelin et al. introduced the derivation, development, inheritance and popularity of intangible cultural heritage along the Beijing-Hangzhou Grand Canal, many of which represent the high level of China's intangible cultural heritage [10]. The famous ones are shown in Table 3.

Table 3. Intangible Cultural Heritage along the Beijing-Hangzhou Grand Canal.

English title	Chinese title
Peking Opera	京剧
Suzhou Garden	苏州园林
Suzhou Xiangshanbang Traditional Architectural Techniques	苏州香山帮传统建筑营造技艺
Yangzhou Lacquerware	扬州漆器
Yangzhou Paper Cutting	扬州剪纸
Traditional Jade Carvings of Suzhou, Yangzhou and Beijing	传统的苏州、扬州、北京玉雕
Celadon of Yue Kiln	越窑青瓷
Wushu (Martial Arts)	武术
Acrobatics	杂技

English title	Chinese title
Comic dialogue	相声
Pingtán (storytelling and ballad singing in Suzhou dialect)	评弹
Longjing (a famous green tea produced in Hangzhou)	名茶龙井
Biluochun (a special brand of tea)	碧螺春
Chinese traditional roast duck	传统烤鸭
Goubuli (a steamed stuffed bun in Tianjin)	狗不理包子

Table 3 shows the richness of the intangible cultural heritage of the Beijing-Hangzhou Grand Canal. Their profound cultural connotations and breathtaking beauty are vivid representatives of the Grand Canal culture, which are also the representative and concentrated embodiment of Chinese culture.

In mid-July 2019, the Chinese Central Government decided to build the National Cultural Park of the Grand Canal. However, there are many issues concerning protection and management of the Grand Canal is worth our attention, such as fragmentation of repair planning, serious ecological degradation of some river sections, the overall management

capacity, especially the international promotion and dissemination of the outstanding cultural value of the Grand Canal.

2. Literature Review

2.1. Relative Studies in China

With the theme of "The Grand Canal", we searched CNKI at 17:00 Oct. 31, 2019, obtaining quantitative visualization analysis results shown in Figures 1-2.

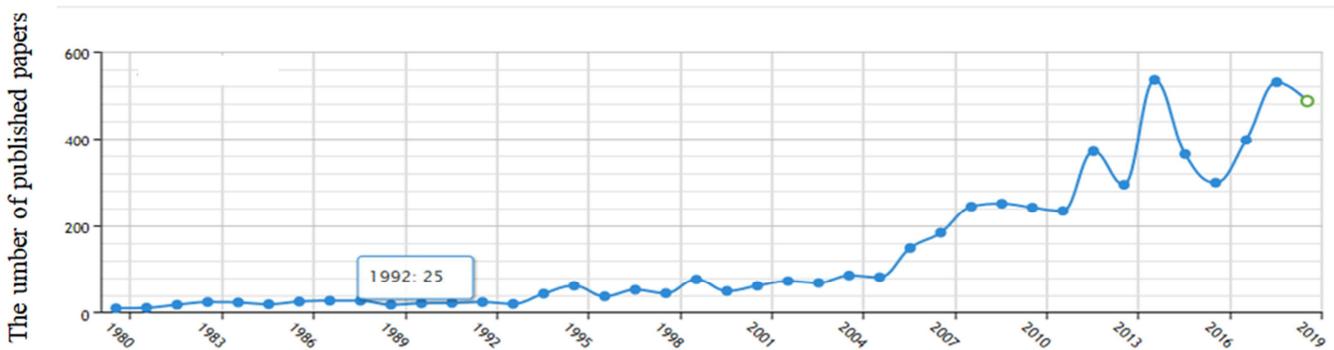


Figure 1. General tendency of Grand Canal study.

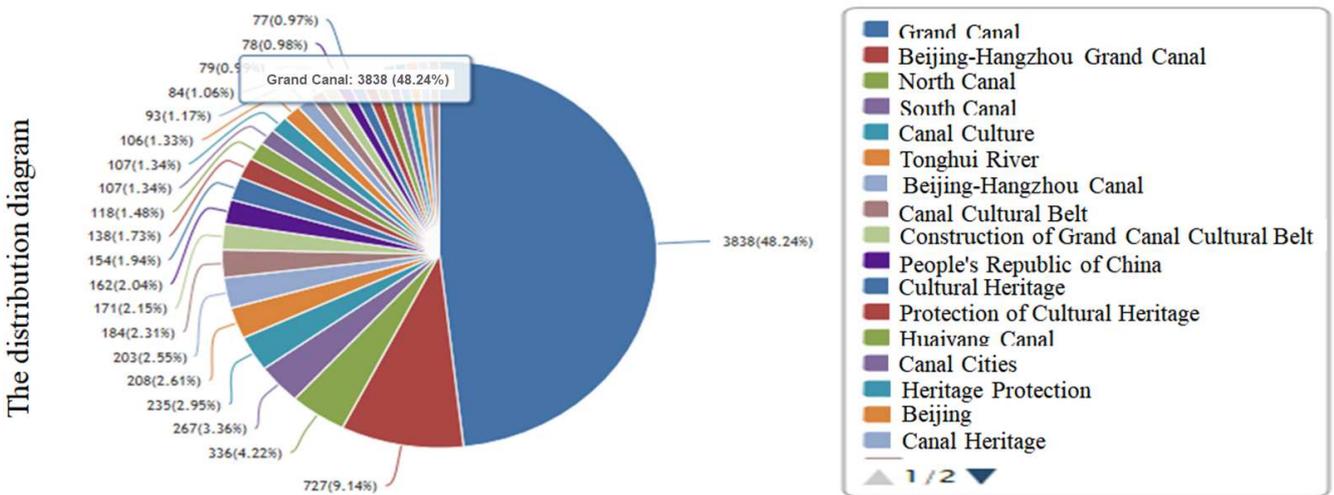


Figure 2. Key words distribution of Grand Canal Study.

It can be seen in Figure 1 that the study of the Grand Canal started from the reform and opening up and reached its peak in 2014 and 2018, which coincides with the national policy of the application of the Grand Canal for World Heritage and the construction of the Grand Canal Cultural Belt. So far, 5683 canal-related academic papers have been published and research topics concerning the Grand Canal have formed a

huge research network. The distribution of key words in this research (Figure 2) shows that most studies are focused upon Beijing-Hangzhou Grand Canal, the cultural belt of Grand Canal, the construction of the cultural belt of Grand Canal and cultural heritage. Relative studies on the conservation and communication of the Grand Canal Cultural Heritage from the following aspects are also investigated.

2.1.1. Theoretical Study on Conservation of the Grand Canal Cultural Heritage

Yu Kongjian et al. introduced the idea of international heritage corridor protection in the book *National Heritage and Ecological Corridor of the Beijing-Hangzhou Grand Canal* and suggested systematic and overall protection of the Grand Canal [8]. Different from the traditional concept of "cultural relics" protection, the Grand Canal should be taken as an ecological, cultural, recreational and economic comprehensive corridor. Jiang Shili and Zhang Yi investigated the outstanding universal value of the cultural heritage of the Grand Canal [13]. After the report of the status quo of the protection of the Grand Canal cultural heritage, utilization of laws and regulations, they discussed how to further strengthen the protection of the cultural heritage of the Grand Canal from two aspects: the protection of the outstanding universal value and the utilization under the premise of protection. Chen Yi and Lv Zhou argue that the 10-year process of application for the World Heritage provided us with an excellent opportunity to reflect on the significance of Beijing-Hangzhou Grand Canal [14]. The cognitive model of "outstanding universal value" advocated by the World Heritage Movement may encourage us to break through the national perspective limitations, broadening our vision with its value for human civilization and passing it down to future generations more effectively. They combine the research results of canal heritage in the world with the abundant historical data of the Beijing-Hangzhou Grand Canal in China, profoundly demonstrating the role and influence of the Grand Canal in human history. At the same time, comparative studies of famous world canals, cultural routes and linear heritage have made the uniqueness and representativeness of the Grand Canal itself clearer and helped researchers and the public to fully understand the precious heritage of the Grand Canal. In addition, some important cases at home and abroad are selected and analyzed in the hope to gather useful experience from abundant protection practices and providing suggestions and references for the systematic protection of the Beijing-Hangzhou Grand Canal with its outstanding universal value.

2.1.2. Studies on Application of New Technology to the Conservation of the Grand Canal Cultural Heritage

Many organizations and scholars have proposed using new technology for "good protection, good inheriting and good utilization" of the Grand Canal. In the paper "Digital Presentation and Inheritance of the Grand Canal", Lu Qihong discussed the significance of using new technology in the cultural education of the Grand Canal for primary and secondary school students with two cases: one is the large-scale television documentary "the Grand Canal" and the other one is "Riding along the Grand Canal Again after 35 Years" Photo Exhibition by Liu Shizhao, a famous photographer [15]. The demonstration project of 2017 (Cultural Heritage Museum Letter [2017] 1786) - "Digital and Virtual Display Education Platform for Cultural Heritage of the Grand Canal" set up by the State Administration of Cultural Relics hopes that, through the implementation of the

project, provinces and cities along the canal will be linked up to present the rich living culture of the Grand Canal. The rich content of economy and technologies, such as virtual reality, augmented reality, internet, big data, artificial intelligence and block chain, are combined to build and share the digital resources of cultural education in the "canal belt". A new system mechanism is adopted to build the education system of point, line and surface culture in the canal basin and an interdisciplinary discipline system of canal protection. "River belt" culture and education are integrated into "research tour", "innovation and entrepreneurship" and "the Belt and Road" Education Action. In this way, tourism, cultural exhibition, cultural protection and heritage are combined together, with planned and forward-looking construction of an enhanced real education exhibition platform. It is critically important to have a good understanding of the Grand Canal, and then "protect, inherit and make good use of" the Grand Canal. Wu Jianyong argued that the construction of the Grand Canal Cultural Belt require provinces and cities along the canal simultaneously carry out both physical protection and digital protection to promote the "creative transformation and innovative development" of the Grand Canal Cultural Heritage [16]. Digital protection may include digital literary products, online virtual tourism, virtual experience combined with AI technology and on-line platform of cultural tourism industry.

The above related studies raise our awareness about better conservation and communication of the Grand Canal Cultural Heritage.

2.2. Relative Studies Around the World

Most overseas records of the Grand Canal are travel notes and memoirs of Western adventurers, missionaries and envoys to China. For example, in 1298, the Venice Adventurer Marco Polo wrote *The Marco Polo Travels*, an important record of the author's experience in China. In the travel notes, the author describes the prosperity of the Beijing-Hangzhou Grand Canal, leading to a rumor about the East where "milk flows on the ground and gold glitters everywhere". *The Matteo Ricci in China* is a testimony of the Italian Catholic Jesuit missionary Matteo Ricci's mission to China during the Wanli period of the Ming Dynasty, which greatly promoted the spread of Chinese culture in the European world. Ricci visited many cities along the canal, including Zhenjiang, Yangzhou, Huai'an, Xuzhou and other cities. In the second chapter of the fourth volume of the book, Matteo Ricci wrote: "From Nanjing to Beijing, there are many famous cities. Apart from the cities, there are many towns, villages and dotted houses along the banks of the river. It can be said that people are prosperous. The products along the way are rich, such as rice, wheat, fish, meat, fruits, vegetables, rice wine, etc.; the prices are very cheap." The book vividly reproduces the scene of the people's livelihood on the canal. In the fourth chapter of the fourth volume, the book also states: "(In Chinese New Year) Father Ricci and Ottawa took a boat trip to Zhenjiang to watch the grand folk performance... In Zhenjiang they also received hospitality by many government officials and cultural celebrities." Ricci's

words are reminiscent description of the New Year celebration in Zhenjiang.

During our visit to the Western Sydney University Library from Dec. 2018 to March 2019, we found many history experts and scholars described the Grand Canal. In *The History of Chinese Civilization* (first published in 1972 by French scholar Librairie Colin in Paris, translated by JR Foster and Charles Hartman into English and published by Cambridge Press 10 years later), the history of the Grand Canal is recorded in detail. For example, from 436 BC to 482 BC, the Wu State excavated a canal to connect the Yangtze River with the south of Shandong; in 95 BC, the 100-kilometer canal connected Wei and Qin in Shaanxi; in 605, the Sui Dynasty Grand Canal system was completed. It illustrates the important role of the Grand Canal in the history of Chinese civilization.

According to Liu Xuan's research on the overseas study of the Grand Canal since the Ming and Qing Dynasties, the study of the Chinese Grand Canal by the overseas academic circles reached its peak in the 1940s and the 1980s [9]. The study gradually expanded, with more diversified topics, from the history of the Grand Canal to the canal-related society, including political, economic, cultural and many other issues. Some scholars pay attention to the micro area such as the engineering and technology history of the Grand Canal, while some others focus on the macro and interdisciplinary perspectives, such as political science, sociology and economics. The rise of environmental history has also been introduced into the Grand Canal study to analyze the influence of the Grand Canal on geographic and ecological environment.

2.3. Weaknesses of Previous Studies

The Grand Canal study has shown an interdisciplinary and multi-disciplinary research tendency, which provides a good theoretical perspective and practical reference for our research. However, there are many limitations in the previous researches. (1) A large number of researches focus on the practical issues of the Grand Canal Cultural Heritage protection, but very few theoretical studies of the Grand Canal attach importance to its general outstanding universal value. The attention of the academic circles at home and abroad to the Grand Canal is concentrated on the practical aspects of the canal engineering technology, transportation, rivers, landscapes, etc. The cultural connotation, cultural value, cultural inheritance and dissemination of the world heritage lack in-depth and systematic research. According to *The Grand Canal Cultural Heritage Planning Outline*, the conservation and inheritance of the excellent traditional culture carried by the Grand Canal should be further improved. For the purpose of guiding the inheritance and utilization of the Grand Canal Cultural Heritage, it is necessary to further explore and enrich the cultural connotation of the Grand Canal, fully display the cultural value of the Grand Canal, activate the cultural power of the Grand Canal, highlight the historical context and contemporary values of the Grand Canal [7]. (2) Chinese

scholars have repeatedly inherited the introspective historical traditions without concentrating on the international communication and extraterritorial influence of the Grand Canal Cultural Heritage. Communication is the best convention. As a World Heritage, the Grand Canal study requires a broader international perspective. At the "National Network Media Alliance Promotion Seminar and National 100 Media Editors Watching Yangzhou" Forum, Deng Qing, Secretary General of the World Canal Historical and Cultural City Cooperation Organization, pointed out that there are about 516 canals in 51 countries around the world along with more than 2,000 canal cities. Canals play an extremely important role in transportation, leisure tourism, cultural heritage, environmental protection and even international geopolitics. It can facilitate the wisdom of the urbanization process, cultural diversity and sustainable development of the canal cities, helping to promote a new type of economic globalization that is open, inclusive, balanced and win-win [8]. (3) Although the use of digital technology in the inheritance and dissemination of the Grand Canal's historical and cultural resources is widely advocated, digital product development and technological innovation of the Grand Canal cultural heritage still need to be improved and popularized.

Therefore, studies of the conservation and communication of the Grand Canal Cultural Heritage is a necessary subject for promoting the construction of the Grand Canal cultural belt and enhancing the global influence of the Grand Canal cultural heritage.

3. Strategies for Conservation and Communication of the Grand Canal Cultural Heritage Within 5Cs

3.1. The Idea of 5Cs

In the *Operational Guidelines for the Implementation of the World Heritage Convention*, the strategic objectives of "5Cs" are as follows: (1) to enhance the *credibility* of the World Heritage List (2) to ensure the effective *conservation* of the World Heritage; (3) to promote effective *capacity-building* of the contracting parties; (4) to enhance the public's awareness, participation and support of the World Heritage through *communication*; (5) To strengthen the role of the *community* in the implementation of the World Heritage Convention. The 5Cs provide us with theoretical and practical enlightenment for effective strategies for the conservation and communication of China's Grand Canal Cultural Heritage.

3.2. Strengthen Research and Promotion of the Outstanding Universal Value of the Grand Canal Cultural Heritage

Outstanding Universal Values are important criteria of UNESCO's evaluation of the World Heritage. It means that "cultural and/or natural heritage transcends national borders

and has a common importance to human beings and their descendants. Therefore, the permanent protection of heritage has an extremely important influence on the entire global community.” It is clear that the World Heritage List emphasizes the universal significance and world value of the world heritage for human society.

According to the UNESCO’s description, the Outstanding Universal Value of the Grand Canal lies in Criteria (i), (iii), (iv) and (vi). Criteria (i) and (iv) lay emphasis on the remarkable hydraulic engineering techniques of the vast agricultural empire that stems directly from Ancient China. Criteria (iii) and (vi) are mainly cultural values of the Grand Canal as a place of major cultural interchanges, concerning the unique cultural tradition of canal management via the ^{cáo yùn} Caoyun (漕运, water transport of grain to the capital) system through successive dynasties. Meanwhile, it contains the ancient Chinese philosophical concept of the Great Unity, which was an essential element in the unity, complementarity and consolidation of the great eastern civilization from ancient times.

However, our survey of the dissemination of the Grand Canal Culture shows that the majority of international students and foreigners in China know surprisingly little about The Grand Canal. The knowledge of the Grand Canal is only confined to huge hydraulic projects, and its symbolic meanings of the unity, complementarity and consolidation are also ignored.

Thus, building the National Grand Canal Cultural Park will be a very effective and efficient strategy to enhance the popularity of the Grand Canal both in and outside of China; but the challenge is how to balance the practical function and the cultural value of the Grand Canal.

3.3. Strengthen the Protection of the Authenticity and Integrity of the Grand Canal by Establishing a Multi-modal Database

At present, the construction of the Grand Canal cultural belt in the whole country has witnessed the unreasonable phenomenon of disunited administration and over-exploitation, which seriously affects the authenticity and integrity of the Grand Canal as a world cultural heritage. The World Cultural Heritage Convention requires Contracting States to submit periodic work reports every six years and a strict monitoring system and phase-out system for heritage protection. The Elbe Valley in Dresden, Germany, has had a negative impact on the landscape by insisting on building a bridge in the river valley. It was delisted in 2009 and sounded the alarm of heritage protection for countries around the world. In addition, in the process of applying for the legacy, many sites of the Grand Canal were excluded due to various unknown factors, such as the Zhenjiang section of the Grand Canal.

With regard to authenticity, we note that the *Operational Guide* adds linguistic and other forms of intangible cultural heritage to authenticity. At the same time, the spiritual and emotional attributes of the heritage are specifically addressed

as following: although spiritual and emotional factors are difficult to be reflected in practice, they are important representations of the nature and significance of the heritage, such as the tradition of inheritance and the continuation of culture in human society. After a thousand years of vicissitudes, the Grand Canal not only remains a “living” canal, but still functions as a “transportation” in the national economy and people’s daily lives. More importantly, the Grand Canal has carried the profound spirit of the Chinese nation across time and space. The emotions, protection, inheritance and utilization of the Grand Canal heritage do not stay in the restoration and reconstruction of the canal entity. Therefore, it is meaningful to explore the precious historical and cultural resources of the Grand Canal, inheriting the tradition and adapting to the times.

With regard to integrity, the *Operational Guide* gradually extends the integrity requirements of the heritage from natural heritage to cultural heritage, requiring the heritage to have sufficient scale to express its characteristics and evolution. Greater emphasis is placed on the integrity of heritage in ecosystem and biodiversity.

In the big data and all-media era, the protection and inheritance of cultural heritage enjoys unique technical support. The launch of cultural products by virtual simulations provides a good idea for the protection of the Grand Canal cultural heritage. In order to effectively protect the cultural heritage of the Grand Canal, the principles of authenticity and integrity of World Heritage protection should be strictly followed by building a multi-modal database of the historical and cultural resources of the Grand Canal through fully exploiting intelligent technologies such as big data, digitalization and virtual simulation.

3.4. Strengthen Capacity Building to Protect, Inherit and Make Good Use of the Grand Canal Cultural Heritage Resources

The complexity of the world issues poses new challenges to human capabilities of protecting, inheriting and utilizing cultural heritage.

3.4.1. The World’s Capacity Is Being Challenged

The Convention for the Protection of the World Cultural and Natural Heritage (hereinafter referred to as *the Convention*) was adopted at the 17th session of the United Nations Educational, Scientific and Cultural Organization on November 16, 1972, while *the Operational Guide* was published at the beginning of 1977. The Commission mobilizes global forces to continually improve *the Convention* and *the Guide* to enhance global capabilities of heritage protection. It also had the highest international participation of countries in the world with 192 Contracting States to date, one of the largest scale international conventions. It is also the most important platform for intercultural dialogue in the international community. It not only has a profound impact on the conservation, sustainable development and intercultural dialogue of contemporary society, but also changes people’s cognitive style and way of

life through protection of all human culture and natural heritage. However, since 2011, when Palestine officially became a party of the World Heritage Convention, the United States-led Israeli allies began to default on UNESCO's membership. It is even more regrettable that The "Palestinian-Israeli conflict" continued to be staged at the World Heritage Committee meeting. With the withdrawal of the United States from UNESCO in 2017, the World Heritage Convention is no longer a purely professional platform. The traditional methods and systems for implementing the Convention face new challenges.

3.4.2. China's Capacity Needs to Be Improved

China has officially joined *the Convention* on December 12, 1985. In 1986, China began to apply for UNESCO World Heritage projects. On October 29, 1999, China was elected as a member of the World Heritage Committee. Up to July 2, 2018, China had 53 world heritage sites, including 36 world cultural heritages, 4 world cultural and natural heritages and 13 World Natural Heritage, ranking the second in the World Heritage List countries (Italy, being the first with 54 items). China has rich experience and wisdom in the application, protection and utilization of world heritage. However, with the deterioration of the natural environment of the earth and the pursuit of material interests by human beings, the protection and utilization of natural and cultural heritage is facing an unprecedented challenge.

As a great living heritage, the ecosystem, biodiversity, historical and cultural resources of the Grand Canal require strong support from political, economic, social, technological and cultural capabilities. There are still many things for China to learn in establishing and improving new mechanism for better protection of the cultural heritage of the Grand Canal, such as planning of the National Grand Canal Cultural Park.

3.5. Promote the Internationalization and Intelligent Communication of the Grand Canal by Means of Big Data, Digitalization and All-Media Technology

As a "living" culture, the Grand Canal not only plays the role of water transportation, but also cultivates the custom and civilization in the past two thousand years. In 1987, CCTV launched the large-scale documentary "The Grand Canal". With the new media of television, the Grand Canal began to enter the homes of ordinary people. In the new century, the application for the world heritage of the Grand Canal once again set off the popularity of the Grand Canal. At the end of 2013, CCTV launched the World Cultural Heritage documentary "The Grand Canal", by taking the best advantage of the latest media technology, which told the story of the Grand Canal as the lifeline of the Great Unity and the Chinese Civilization with clearer pictures, more vivid documents and more colorful movies. The virtual simulation of famous painting of *The Riverside Scene at Qingming Festival* is available online.

The Grand Canal belongs not only to China, but also to the whole world. In the history of Chinese and foreign cultural

exchanges, the Eastern civilization carried by the Grand Canal has brought wealth and wisdom to the West. The excavation of the Dutch Leiden Tugboat Canal in Amsterdam was the inspiration and resonance of the Dutch envoy who came to China in the mid-17th century. As a link between the Belt and Road, a brand extension of Zheng He's voyage to the Western China Canal, King Sulu and his descendants became the onlookers of the Canal. In 2006, a British sinologist Lin Jie traveled along this human miracle, and then opened his Tour Exhibition of the Grand Canal in the United Kingdom. He compared the Grand Canal and the Great Wall to the Chinese Yin and Yang view, showing Chinese people's national pride everywhere. Later, he wrote a book titled as *Yuhe (The Emperor River)*. New China has given the ancient canal a new vitality. Joint efforts for the protection and utilization of the Grand Canal are being organized to continue to write a new chapter in the Chinese nation. Since the launch of the application for World Heritage in 2006, scholars from China and all over the world have been calling for the conservation and communication of the Grand Canal. Art exhibitions, musicals, forums, large documentaries, volunteer groups (404) and touring exhibitions all over the world have largely promoted the image of the Grand Canal. Regrettably, although the beautifully produced documentary has targeted the international community as the potential audience, it is not equipped with English, the international language, as a carrier.

In the new era, with the promotion of Chinese culture, the Belt and Road Initiative and the construction of the Grand Canal cultural belt, the promotion of the Grand Canal has become an international trend with the canal-themed tourism. In early 2018, Yangzhou tourism promotion film was reported by BBC with the head "Come to the Source City of the Grand Canal".

However, more time and efforts are needed to improve the international publicity of the Grand Canal with the aid of modern communication technologies, such as film, television, the Internet, virtual simulation and VR & AR. The cooperation between international media is also expected to be further promoted. Take the existing CCTV's "The Grand Canal" (2014) documentary as an example, we can work together with international mainstream media such as BBC, PBS and SBS to promote the documentary all over the world.

3.6. Mobilize the Community's Forces to Build a Canal Culture Community

Previous research found that the national policy of constructing the Grand Canal Cultural Belt has mobilized the enthusiasm of experts in many fields, providing relative useful theoretical support. The governments along the Grand Canal are also introducing relevant regulations and laws to strengthen the protection of the Grand Canal infrastructure, including Grand Canal theme parks, museums, exhibition halls and green corridors. Communities, schools, enterprises and societies are organized to join all types of activities, such as the Grand Canal Forum, the Canal Temple Fair, the Grand Canal Cultural Tour, the Grand Canal Walk and the Grand Canal

Cycling Tour, creating the social atmosphere. However, the inheritance and dissemination of the cultural heritage of the Grand Canal have not yet formed a synergy and lack of overall planning. More international forces should be mobilized and integrated to help preserve the Grand Canal as a world heritage. It is of great significance to promote the construction of the global "canal culture community", gather wisdom of global scholars, break through the language barriers and tell the canal stories in different languages, so that the world may benefit from the civilization of the Grand Canal.

4. Conclusion

The Grand Canal as a world heritage has its outstanding and universal value in engineering, hydraulics, technology, transportation, rivers, landscapes and many other domains. Within the framework of "5Cs", this paper attempts to strengthen the conservation and communication of the Grand Canal cultural heritage by various means. Centering on the theme, the paper explores its outstanding universal value, strengthens its authenticity and integrity protection, enhances its capacity building, as well as promotes its application, internalization, and global communication. Meanwhile, the conservation and communication strategy attaches great importance to the historical and cultural resources of the Grand Canal in the age of big data, by building a multi-modal database and employing modern technological technique including virtual reality, artificial reality and augmented reality, via the platform of Internet and all-media. The strategy plays an important role in promoting the construction of the Grand Canal cultural belt, the Belt and Road Initiative and the construction of a human community with shared future. It hopes to provide theoretical support and references for further conservation and communication of the Grand Canal.

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