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The use of Geographic Information System in the development and utilization of ancient local chronicles

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Abstract

Purpose – The purpose of this paper is to apply Geographic Information System (GIS) in the development and utilization of Chinese ancient local chronicles to achieve the mining and visualization of historical data about products distribution and dispersal in *Products in Local Chronicles of Guangdong*.

Design/methodology/approach – Using 1,756 records of product-related location names in *Products in Local Chronicles of Guangdong* of the Qing dynasty, which are recognized by a name recognition system, as attribute data; taking the spatial data of Chinese administrative geography of the Qing dynasty in 1820 and the *Historical Atlas of China* as spatial data; connect the attribute data with relevant spatial data based on the table connection function of Arcmap in Arcgis 8.3 to implement the data management, cartography and analysis.

Findings – The application of GIS in the development and utilization of ancient local chronicles was quite successful. With some thematic maps, knowledge about products distribution and dispersal in ancient books was vividly displayed so as to facilitate relevant researches.

Research limitations/implications – Only product-related location names inside China were analyzed, not other named entities in local chronicles; and only static visual display was achieved, not dynamic visual display. Historical maps of the world can be used to carry out the visualization of the products distribution and dispersal in the world, and even the visualization of other knowledge, such as poetries and songs scattered over many places in China. The process of products dispersal and the distribution of poetries and songs can be dynamically and visually displayed by pictures, audios, videos, multimedia, etc.

Practical implications – By using GIS in the development and utilization of Chinese ancient local chronicles, this paper explores a new way for the collation of ancient books and open up a new area for the research of digital humanities.

Originality/value – This is the first try about the application of GIS in the development and utilization of ancient local chronicles, and also the same of digital humanities research in the field of agricultural history.

Keywords Digitization of ancient books, GIS, Digital humanities, Collation of ancient books, Local chronicles

Paper type Research paper

1. Introduction

A local chronicle, which is short for a local history, is a comprehensive description that records the history and current situation of certain regions in all aspects of nature and society (Lai, 1984). Chinese local chronicles are known worldwide as they have long

history, variety of types and a very large number (Ma and Han, 2004). According to the statistics of Union Catalog of Chinese Local Chronicles, there are about 8,264 kinds of local chronicles, a total number of more than 110,000 volumes, which account for about one-tenth of Chinese ancient books. Chronicle, a kind of Chinese traditional culture's treasure as well as a unique part of the world literature, retained valuable historical information with multiple functions material. On the other hand, they are too big to be exploited as much as possible. In ancient times, researchers searched the material on chronicles page by pages, which wasted too much time. Nowadays, with the rapid development of information technology, it is very necessary to use information technology for the usage of large numbers of chronicles. Information technology can help researchers collect, manage, exchange, share and analysis the material, so that they can change or even improve the theoretical system as well as the research methods (Kong, 2006). At present, based on information technology, digital collation of ancient local chronicles, which are conducted by Chinese scholars, has achieved remarkable results, such as bibliography database, special topic database, full-text database, e-books and web site of a region. And some scholars even have made some efforts on the organization of ancient local chronicles by text mining (Heng and Hou, 2009).

A new subject, digital humanities, was created abroad in the cross-linked area of digital technology and humanities research. There is no an authoritative and unified definition of digital humanities. Professor John Unsworth talked about digital humanities in "What is Humanities Computing and what is not?" He pointed out that, Humanities Computing is a practice of representation, a form of modeling or mimicry. It is also a way of reasoning and a set of ontological commitments, and its representational practice is shaped by the need for efficient computation on the one hand, and for human communication on the other (Unsworth, 2002). There are many research societies and special research institutions of digital humanities overseas and they have made abundant achievements in philosophy, history, literature, linguistics, art and other research branches based on text analysis, Geographic Information System (GIS), interactive games, multimedia and other technologies and tools. For example, in the study of classical literature, Chen Bingzao in the University of Wisconsin did a series of research on the author ownership of *A Dream of Red Mansions* with the help of computer. Based on the frequency of occurrence of characters and words, he did some statistics, processing and analysis by computer, and pointed out that the author of *A Dream of Red Mansions*, both the former 80 chapters and the later 40 chapters, was the same person Cao Xueqin. This research reflects that the statistical analysis of word has become a special kind of literature research method, especially in authors identifying and analysis of literature style and genre (Wang, 2009). Also in the study of history, a research project in University of North Texas funded by National Endowment for the Humanities, implemented the mining and visualization of historical newspapers based on text mining and GIS visualization technology (NEH, 2010); the role of text mining is to find language modes distributed in texts from huge amounts of digital historical newspaper, and the GIS visualization technology can visually display language patterns according to the change of time and space. In summary, some researchers have made some achievements on the application of GIS, but the use of GIS in the development and utilization of local chronicles has not been reported.

Although digital humanities is a new concept and terminology in China, many colleges, universities and research institutions in China have already made digital humanities as their research contents. Among their results, some are related to the application of GIS, such as geographical information service system of Chinese Academy

of Social Sciences (Chinese Academy of Social Sciences, 2014), Sino-Family-Tree GIS of Virtual Geographic Environment Laboratory of Nanjing Normal University (2014), application of GIS in the Peking University ancient literature resource database (Wang, 2006) and so on, but application of GIS in the development and utilization of local chronicles is relatively rare.

Based on the research about *Products in Local Chronicles of Guangdong*, this paper illustrates the bright prospect of the application of GIS in the development and utilization of local chronicles. Previously, authors have exacted some entities relevant to geography and history by text mining, such as product names, location names, time and so on (Bao and Zhu, 2014). Based on the statistical analysis on these entities, and by using GIS, this paper attempts to find the evolvement rule of products distribution and dispersal in *Products in Local Chronicles of Guangdong* changing with space and time, and visually display it. First, the paper does feasibility analysis on the application of GIS in the development and utilization of local chronicles. Second, it introduces the data and method used in this paper. And third, authors pay an emphasis on the description of the of help of GIS to the management and analysis of local chronicles, such as data management and inquiry, geographic cartography and analysis, etc. and display the function of GIS by several figures. Finally, authors do assessment on the function of GIS in the development and utilization of local chronicles and make some discussions.

2. The feasibility analysis of using GIS in the development and utilization of local chronicles

2.1 Introduction about GIS

GIS, a newly emerged technology which has gradually developed since the 1960s, is a computer system based on spatial database. With the support of computer hardware and software, GIS processing data, include collecting, storing, managing, operating, analyzing, stimulating and also displaying, using the geography model analysis method. It timely provides a wide range of spatial and dynamical geographic information to serve for the relevant research and decision making (Chen *et al.*, 1999). Initially, GIS is generated to solve the geological problems. Now, it has become a synthetic discipline related to many branches, such as surveying and mapping science, geography, environmental science, space science, network technique, etc. The application of GIS also has extended to many other areas, such as resource, environment, land, house property, urban construction, fire protection, transportation, finance, telecommunication, weather, geology, agriculture, forestry, electric power, government office work and so on (Chu and Yang, 2011). The fundamental functions of GIS include three parts: acquisition and management of spatial data; visualization of spatial data (map display and cartography); and spatial analysis. These functions have high practical value since they can help scholars deal with the effective management and spatial mapping of complex statistical data, and also assist scholars in relevant analysis, interpretation and mining (Shi *et al.*, 2008). Three parts of the fundamental functions of GIS are introduced specifically as follows.

(1) Spatial data acquisition and management.

The accurate and efficient access of spatial data are the basis of the GIS's robust operation. The sources of spatial data are diverse, including map data, field survey data, spatial orientation data, photogrammetry and remote sensing images data, multimedia data and so on. Different data have different collection methods, the spatial

data that can obtain are also different, which involves: first, the choice of data sources; second, the determination of sampling methods; third, the further editing and processing of data, including error elimination, mathematical basis transformation, data structure and format of the reconstruction, the graph splicing, the topology generation, data compression, quality evaluation and control, etc., ensure all kinds of data can meet the demand of data storage and spatial analysis. Fourth, make the data loaded to let the collection of space data goes into the spatial database uniformly (Tang *et al.*, 2007).

(2) The visualization of spatial data.

The visualization of spatial data refers to the theories, methods and technologies showing and interacting the data and results of geological information which was inputted, processed, queried, analyzed and forecasted in the form of visual display, such as graphical symbols, graphics and images combining with the graphics, texts, tables, videos, etc. by using cartography, computer graphics and image processing technology.

The process of spatial data visualization includes: first, search the elements, characteristics and location information out of the GIS database; second, pretreatments; third, to carry out the symbolization through the processes, reading the symbol information from the symbol library, reading the Chinese characters and character information from the character library, reading the color information from the color library, etc.; and fourth, output the maps (Hu *et al.*, 2007).

(3) Spatial analysis.

Spatial analysis refers to the analysis technics which acquire the spatial location, distribution, morphology, formation and evolution information of the relevant geographic objects; it is one of the core functions of the GIS. In the research and practice of the spatial analysis, many analysis means which have a certain universal significance, involving the spatial location are summarized and refined, forming some inherent spatial analysis function modules contained in the GIS software, including superimposed analysis, buffer analysis, window analysis and network analysis (Tang *et al.*, 2007).

2.2 The application research of GIS in literature management, development and utilization

The researches about using GIS as an aid in literature management, development and utilization all exist in China and other countries, which mainly about using the GIS technology to achieve the visualization display and analysis of the related knowledge in the literature. As mentioned above, the University of North Texas applied the GIS visualization technology for the visual display of the language mode in the history newspaper according to the change of time and space. Again for instance, the Hestia project sponsored by Arts and Humanities Research Council (AHRC), in which the scholars conducted the information extraction and visualization about the sites and its geographical features in the history works of Herodotus (Greek historian), which provides the visualization tools that can dig deeper into the text topology (AHRC, 2014). The Geography Information Service Platform System of Chinese Academy of Social Sciences is also based on the GIS visualization technology, which has a full range show of the features about the information and research results in the field of philosophy and social sciences, including the social science information, such as, Chinese dialect, national distribution, national language, etc. The system includes common electronic map operation, electronic

map auxiliary function, electronic map advanced features, thematic map display, map query, map measurement, autonomous annotation, place name retrieval, integrate query, multimedia display, etc. The Chinese Genealogy GIS Platform of Nanjing Normal University Virtual Geographic Environment Laboratory introduces the GIS technology into the genealogy study, making full use of GIS's unique geographical spatial orientation, query and analysis ability, flexible way of drawing and powerful visualization expression ability, strengthening the collection, recording, analysis and application of spatial information to make the spatial information display from the genealogy, construct the space-time genealogical tree of Chinese nation and reappear the thousands of years of Chinese civilization history from the perspectives of space and time. The Ancient Books Digital Library System of Peking University uses the retrieval technology and visualization technology of GIS, users can retrieve rubbings through GIS, and can know its distribution clearly, thus breaking through the traditional mode of text retrieval, fully revealing the space-time characteristic of historical and cultural resources. In addition, through integrating Han electronic document system, the food price database of Qing Dynasty, the local chronicles union catalogue database of Ming and Qing Dynasties, etc., the Map System of Chinese History and Culture completed by the computer center of Taiwan Academia Sinica carries out the historical and cultural monographic studies, such as the Yellow River flood buffer analysis in Tang Dynasty, the River South town space change analysis in Ming and Qing Dynasties, the food prices in Qing Dynasty and the spatial analysis of the population integration, the southeast lines of Su Shi through the route, etc. (Academia Sinica, 2014). The existing researches, all studied the application of GIS in literature management, development and utilization, with the study of historical newspapers and historical works, the study of genealogy and rubbings and also the study of local chronicles, however, the studies were only limited to the database of the local chronicles catalogue, without any connection with the content of the local chronicles.

The GIS technology was mostly applied in the research to implement the visualization display and analysis of the related knowledge in the literature, providing supports for the scientific researches on the topic of family tree, dialect, etc. All these researches provided references for this research; this paper will achieve the knowledge organization of the local chronicles content with the help of GIS technology, keep focus on visually displaying and analyzing the knowledge of product distribution and dispersal.

2.3 The feasibility analysis of the application of GIS in the development and utilization of local chronicles

One of the key elements of GIS is data source and data. Data used and processed by GIS are divided into two categories: the spatial data as well as the attribute data. Large number of published literatures relevant to GIS emphasizes on the discussion of geographical spatial data, and ignored to research on the attribute data, which is of equal importance. In fact, in many actual applications, attribute data is often insufficient and incomplete. Local chronicles have so much attribute data that relevant to certain subjects. If local chronicles can be developed as the general data source of GIS, the peculiar advantage of them can be easily found, such as it has rich resources, it can help to find the related information overview of past and present and it even can also make the GIS system's function strong enough to promote the economic (Gong and Hu, 2001). By using GIS in the development and utilization of local chronicles, and with the help of GIS's visualization display technology and function of inquiry and analysis, the evolvement rule of some relevant knowledge contents in chronicles contents changing with space and time can be visually displayed. This will greatly reduce the

difficulty of the development and utilization of local chronicles, and explore a new way for the collation of ancient books as well as open up a new area for the research of digital humanities.

In conclusion, on one hand, GIS can provide technical support for the development and utilization of local chronicles and reduce the difficulty of the development and utilization; on the other hand, the development and utilization of local chronicles can provide the best data source for GIS. Therefore, introducing GIS into the development and utilization of local chronicles will be very profitable and necessary.

3. The use of GIS in the development and utilization of local chronicles
3.1 Data and method
This paper uses the attribute data of *Products in Local Chronicles of Guangdong*, comes from Institute of Chinese Academy of Agricultural Civilization in Nanjing Agricultural University. In the 1950s, Chinese famous agricultural historian Wan Guoding organized dozens of people to extract and transcribe historical data relevant to products from local chronicles hand by hand. The topical data, which they have spent six years to collect, is called *Products in Local Chronicles of Guangdong*. The content of *Products in Local Chronicles of Guangdong*, which is the only set of local agricultural information of Ming and Qing dynasty in the world, involves all aspects of agricultural production. It records the name, property, function and distribution of products in details. So that it has so much high value of agricultural science and technology and economy history (Wang and Chen, 2005) for scholars to pay great attention to both at home and abroad. In order for better preservation, dissemination and also utilization, Institute of Chinese Academy of Agricultural Civilization hired some professional typists to input the manuscript of *Products in Local Chronicles of Guangdong* word by word, and generated the electronic text documents. Taking *Products in Local Chronicles of Guangdong* as an example, the author introduces the rules-based and statistics-based method and implements a recognition system about location names in ancient local chronicles to achieve the automatic recognition of products location names. The results of location name recognition reflect the status of explanation about product location name in source local chronicles, and reflect how thorough the description is from the perspective of place names. These both embody the historical material value of local chronicles.

By the recognition, there are 2,876 valid records of product location names in *Products in Local Chronicles of Guangdong* of the Qing dynasty in total, and among these, 1,585 records refer to places in Guangdong province; 171 records involve places outside Guangdong province, such as Fujiang and Guangxi; 391 records refer to places outside china, such as Vietnam(formerly known as An Nanguo), Iran(formerly translated as Persia), Siam(which was the old name of Thailand); and other 729 records involve places covering a wide range, such as Lingnan, to the area south of the Five Ridges. This paper only uses the 1,585 records refer to places in Guangdong province and the 171 records involve places outside Guangdong province inside China, a total of 1,756 specific location names records, which including the fields "Product name", "Location name", "Rule name", "Book name", "Time" and so on, for the statistics and analysis. For the convenience of statistics, the field "State" was set, so that location names by recognition can be grouped under the administrative division, a certain state that they belong to. Some results are shown in Table I as examples.

The spatial data adopted in this research includes two sources. One is the spatial data of administrative geography of the Qing dynasty in 1820 shown as Figure 1. This was accomplished by the cooperation of Historical Geography Research Center of Fudan

Product	Location	State	Rule	Chronicle	Time	Category
Silkworm silk	Chengxiang	Leizhou State	Originated from – is better	*The State Chronicle of Chaozhou*	1661	Cloth and silk
Sambucus chinensis	Fengchuan	Zhaoqing State	Originate from –	*The State Chronicle of Zhaoqing*	1673	Medicine
Chinese black olive	Guangzhou	Guangzhou State	Spread from –	*The Country Chronicle of Huilai*	1730	Fruit
Dried Japanese scallop	Yazhou	Qiongzhou State	Produced in – is better	*The State Chronicle of Qiongzhou*	1774	Cyprid
Fragrant rice	Dabu	Chaozhou State	Only – has	*The Country Chronicle of Dabu*	1804	Grain
Agastache rugosa	Qiongshan	Qiongzhou State	Originated from-is better	*The Country Chronicle of Qiongzhou*	1857	Medicine
Rhizoma smilacis glabrae	Dabu	Chaozhou State	Only – has	*The Country Chronicle of Dabu*	1873	Medicine
…	…	…	…	…	…	…

Table I.
Recognition results of location names in *Products in Local Chronicles of Guangdong*

Figure 1.
Spatial data of administrative geography of the Qing dynasty in 1820

University and Harvard University. The other is the *Historical Atlas of China* written by Tan Qixiang. We digitize some relevant maps in order to get spatial data.

Using the 1,756 records of product-related location names in *Products in Local Chronicles of Guangdong* of the Qing dynasty as attribute data, and taking the spatial

data of Chinese administrative geography of the Qing dynasty in 1820 and the *Historical Atlas of China* as spatial data, this paper connects the attribute data with relevant spatial data based on the table connection function of Arcmap in Arcgis 8.3 to implement the data management, cartography and analysis. With some relevant thematic maps, the evolvement rule of products distribution and dispersal in *Products in Local Chronicles of Guangdong* changing with space and time can be found and visually displayed, so as to help scholars to conduct their scientific researches.

ArcMap is an application which can be used for data input, edit, query, analysis and so on. It has all the functions based on maps, such as cartography, map edit, map analysis, etc. ArtMap contains a complex professional drawing and editing system, it's an object-oriented editor, and also a data table generator. ArcMap provides two types of map view, data view and layout view. In the view of data, users can display the geographic layer symbolically, analyze and edit the GIS data sets. In the view of layout, users can deal with map pages, including geographic data view, and other data elements, such as legend, measuring scale, compass, etc. Users can interoperate with maps by browsing, analyzing, displaying results, customizing, programming, etc. (Maribeth Price, 2012).

3.2 Management and analysis platform about Products in Local Chronicles of Guangdong based on GIS

Starting from the study of the composition of location names records recognized in *Products in Local Chronicles of Guangdong*, this paper analyzes the characteristics of the structural composition of location names records, researches the data model of information about products distribution and dispersal in local chronicles; and then, introduce GIS technology into the research of products distribution and dispersal, designs a unified space-time framework supporting the analysis of products distribution and dispersal; finally, builds the GIS platform for products management and analysis in local chronicles. The functions of the platform mainly include data management and inquiry, geographic cartography and analysis.

(1) Data management and inquiry.

In the development and utilization of ancient local chronicles, the most common basic needs from users is to retrieve some historical data in local chronicles. Application of GIS technology can not only meet the needs of the users' information retrieval, but also make it easier for users to understand contents of historical materials and do subsequent researches by visually displaying the spatial distribution of the retrieved results with visualization technologies. The implementation of this function mainly relies on the Arcmap database management system. Using the database management system that the Arcmap comes with, management and inquiry of relevant geographic attribute data in ancient local chronicles can be achieved, with it, we can query about the attribute information of a certain geographical unit, the spacial distribution of the geographical unit which is suited to certain attributive character and so on. For example, Figure 2 shows the result of the inquiry about the spacial distribution of geographical units where kudzu vine and ko-hemp cloth appear.

(2) Geographic cartography and analysis.

In addition to the basic needs of information retrieval, in the process of development and utilization of ancient local chronicles, users are more eager to get the rule and characteristics of contents about historical materials in historical literatures, so as to provide reference for their scientific researches. Using GIS technology, the evolvement rule of relevant knowledge

Figure 2.
Result of the
query about the
distribution of
kudzu vine and
ko-hemp cloth

contents changing with space and time can be found and visually displayed, which is also beneficial to the users' scientific researches. The implementation of this function mainly based on the Arcmap cartography. The thematic maps that draw by Arcmap can visually reflect the character of the distribution of products recorded in ancient local chronicles as well as do some comparison and analysis on different times.

As shown in Figure 3, cylinders with different colors facilitate the comparison about products distribution on the aspect of years crosswise on different regions in each state of Guangdong in the Qing Emperor Kangxi, Yongzheng and Qianlong, and the different heights compares longitudinally on different times of these regions. What should be explained in Figure 3 is that the legend including three cylinders with different colors and heights and the figure 76 is automatically generated by system. The figure 76 is a reference account which means that the product number indicated by the highest cylinder among the three cylinders is 76. Readers can get a rough estimate about the product number of each state in Guangdong based on the reference, and this may facilitate their analysis about the reasons for the difference between product diversity of each state combining with the relevant knowledge of history and geography. For example, fewer products are distributed in Lianshan state in the north of Guangdong and Lianzhou state in the west. In contrast, more products are distributed in Zhaoqing state and Guangzhou state in bead trigonometry area of south-central Guangdong, and the Qiongzhou state in the southernmost part of Guangdong. The two reasons are as follows: one is that these regions' superior natural environment is very suitable for the growth of plants and the breeding of animals. The other is that these regions have unique geographical location, abundant marine resources, convenient shipping conditions and also frequent maritime trade, all of these increased the introduction of species and expanded the transmission
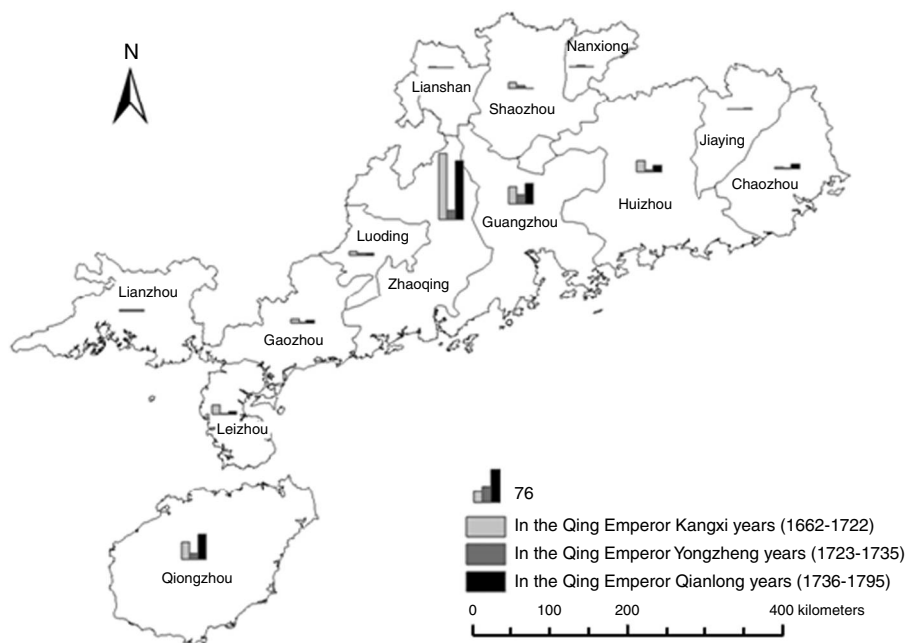
Figure 3.
Histogram of
products numbers of
each state in
Guangdong in the
early Qing dynasty

range of species. In addition, by Figure 3, readers can also have an intuitive understanding of the increase and decrease of products in Kang and Qian times.

Figure 4 shows the products dispersal outside Guangdong province in the Qing dynasty recorded by Products in Local Chronicle. In Figure 4, six different shades of
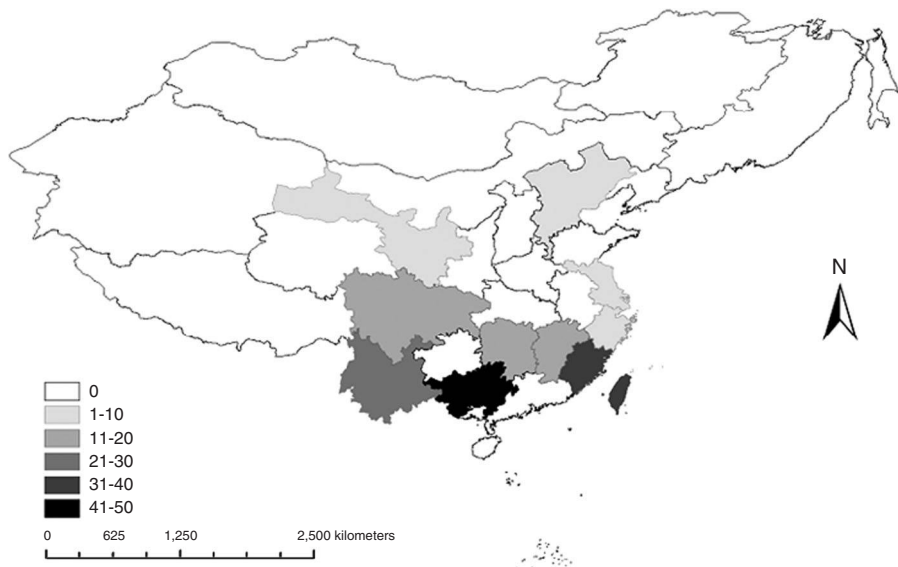

Figure 4.
Products distribution
outside Guangdong
province in the
Qing dynasty

colors are used to show different numbers of product dispersal. Product dispersal numbers among 1-10 are displayed with the lightest color, product dispersal numbers among 41-50 is shown with the deepest color while the achromatic color indicates that there is no product disperses in the place. By this, researchers can know about the products exchange and dispersal among Guangdong and other provinces. For example, the farther the distance does, the less the product exchange and dispersal between regions.

3.3 Evaluation on the GIS platform
From the above introduction of platform functions and the demonstration of related cases, the management and analysis platform about *Products in Local Chronicles* based on GIS contributes to the development and utilization of the ancient local chronicles. The information query results show that, compared with the records that exist in ancient local chronicles or just be listed simply in the relevant statistical data, the application of GIS breakthroughs the traditional character description, so that the time-space characteristics of information resources in local chronicles can be revealed more and it is very helpful to the inquiry, management and utilization of the data. Moreover, the function of cartography and analysis not only provides users with the evolvement rule of product distribution and dispersal changing with space and time, but also displays visually. This will greatly facilitate scholars with their research on products distribution and dispersal, and this is what we cannot get only to research from the original records in documents.

4. Discussions
Products in Local Chronicles of Guangdong, which belong to the category of ancient books, have different written format and language character compared with the modern literature as they have no punctuation. By the method of location name recognition, a series of statistic data which is shown in Table I was attained. This is an effective progress in the application of information technology in the development of local chronicle resources. But the data in tables seems slightly dull and monotonous. As this, the author began the research on the application of GIS tools, which can achieve the visualization of relevant knowledge, the time-space characteristics of information resources in local chronicles by thematic maps and can also provide researchers with a more intuitive image reference.

This paper implements the development and utilization of the ancient local chronicles with the help of GIS technology, digs out the evolvement rule of product distribution and dispersal changing with space and time in the local chronicle literature and displays it visually. This research enriches and expands the value of historical materials in *Products in Local Chronicles of Guangdong* greatly, and also it's a breakthrough in the field of GIS application research. But in this research, the visualization display of historical materials by using GIS is slightly monotonous limited to the singleness of the mining of the historical materials content in local chronicles at the early stage, which only involves the display and analysis of the product distribution and dispersal, without any introduction about other equally geographic attribute knowledge content, such as, the regional verses culture and so on, which recorded in the ancient local chronicles, too. In addition, in this research, the method for the visual display of knowledge content by using GIS technology is slightly sole, only static visual display was achieved, failing to carry out the dynamic visual display, and the distribution area of the knowledge content displayed is only limited to China, without any introduction about the introduction path of the product in foreign countries. Historical maps of the world can be used to carry out the

visualization of the products distribution and dispersal in the world, and even the visualization of other knowledge, such as poetries and songs scattered over many places in China. The process of products dispersal and the distribution of poetries and songs can be dynamic visual displayed by pictures, audios, videos, multimedia, etc.

5. Conclusions

The purpose of this study is to explore a new way for the digital collation of ancient books by exploiting their historical data as much as possible. Based on the research about *Products in Local Chronicles of Guangdong*, this paper illustrates the prospect of the use of GIS in the development and utilization of local chronicles. By using GIS, this paper achieves the management, visualization mapping and spatial analysis of related historical data about products distribution and dispersal in *Products in Local Chronicles of Guangdong* of Guangdong. From the existing analysis research results, we have realized that it's very necessary to use GIS to assist the development and utilization of local chronicles. The use of GIS not only can facilitate the management and utilization of relevant statistics, but also helps researchers to do some deep data mining and analysis. On one hand, this new method provides a new way to manage and exploit relational knowledge of local chronicles. On the other hand, the attempt opens up a new area for the research on digital humanities, especially the application of GIS. In the future, researchers can do more to improve the relevant spatial data and attribute data. Researchers can use the thematic maps to achieve more mining of historical chronicles, so that local chronicles are no longer isolated data, but will become a three-dimensional knowledge base with cultural information serving for academic researches and economy constructions.

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