

Study on the Digital Development Path of Intangible Cultural Heritage Handicrafts in Gansu Section of the Yellow River Basin

Yalong Zhang^{1,*}, Yafang Gao²

¹College of Geographical Sciences, Qinghai Normal University, Xining, Qinghai, 810016, China

²School of Tourism, Lanzhou University of Arts and Sciences, Lanzhou, Gansu, 730030, China

*Corresponding author: zhangyalong0809@163.com

Keywords: Yellow River Basin; Gansu; Intangible Cultural Heritage; Handicrafts; Digital Inheritance

Abstract: After modern scientific and technological means intervene in the protection of cultural heritage, traditional intangible cultural heritage can be digitized for display and larger-scale production, and gradually become a relevant cultural industry, intangible cultural heritage inheritance and development must be digitized with the help of technology to form a real cultural industry. The purpose of this paper is to study the inheritance of digitized intangible cultural heritage. Firstly, the main features and constituent elements of intangible cultural heritage are summarized. And the principles of digital protection of intangible handicrafts are elaborated, followed by analyzing the process and design method of establishing the digital protection platform. Taking traditional handicrafts as an example, through the questionnaire survey, more than 90% of the people think that the inheritance of intangible handicrafts is very necessary, and that the inheritance of intangible handicrafts by implanting non-heritage elements in the use of cell phone APPs will be effective. Finally, the digital means is used to realize the digitalization of the expressions and cultural space of the non-heritage handicrafts, and a digital display platform based on the database is constructed, which provides a new way of thinking for the inheritance and development of the traditional handicrafts of intangible cultural heritage.

1. Introduction

The reason why the Chinese nation is able to stand in the forest of the world's peoples is not only because she has gone through five thousand years of wind and rain, but also because of the process of the formation of the vast and profound, colorful Chinese culture [1-2]. The intangible cultural heritage has also been baptized by the winds and rains of history, and has been inherited and developed in the long river of history [3-4]. Intangible cultural heritage not only contains the great wisdom of the Chinese nation, but also carries forward the great spirit of the Chinese people [5-6]. The current wave of technology and humanities intertwined to form a new society is devouring the soil on which the intangible cultural heritage is based and eroding the traditional culture, and people

are gradually beginning to consciously pay attention to the protection and inheritance of the intangible cultural heritage [7-8]. Mcmanamon F P argues that project workflows must ensure that documents and data are fully documented and stored in a publicly accessible digital repository, where they can be discovered, accessed and reused to enable new insights and build knowledge [9]. Backman M divides the city, nature, and cultural quality into the different sources of regional attractiveness, and estimates the impact on individuals that have been indirectly educated for about 3 years from 2001 to 2010. Neighborhood-level data are used and unobserved heterogeneity and spatial dependence are modeled by using random effects estimation and instrumental variables methods. The results of the study show that the supply of local built heritage and cultural environment is an important part of human capital growth in Sweden. These types of cultural heritage resources contribute to regional attractiveness and growth [10]. Promoting intangible cultural heritage is a need for economic development and an important historical mission entrusted to us by history. Starting from the traditional inheritance mode of intangible handicrafts in the Yellow River Basin, this paper analyzes the ways and means of the inheritance and protection of intangible handicrafts in the Yellow River Basin, affirms the milestones achieved in recent years, points out the methods and ways of digital inheritance and development of intangible handicrafts in the Yellow River Basin, and proposes a new mode of digital protection of intangible handicrafts in the Yellow River Basin, taking into account advanced intangible cultural heritage protection and inheritance experiences at home and abroad. The features and innovations of this paper are: exploring new digital protection and inheritance methods of intangible handicrafts in the Yellow River Basin, and figuring out a set of inheritance and development paths of intangible handicrafts in the Yellow River Basin that can play an active role and have a long-lasting mechanism. Utilizing multi-disciplinary, related professional knowledge and analytical means to conduct research from all aspects. And we can utilize the latest research results to promote the digital protection and inheritance of non-traditional handicrafts in the Yellow River Basin and promote the enrichment and development of its scientific theoretical system.

2. Research on the Digital Inheritance and Development Path of Intangible Heritage Handicraft in the Yellow River Basin

2.1 Intangible Cultural Heritage

(1) Main features of intangible cultural heritage

First, specific ethnicity. The development history of different ethnic groups have their own characteristics, according to their different living customs, ways of thinking, behavior and so on show different cultural characteristics [11]. Specifically, it is oral expression in the national language, interpretation of the unique style of performance and its own rituals and ceremonies of the celebration activities, to show the world, the people's understanding of nature, a variety of channels to show their own history and inheritance. Secondly, liveliness, the characteristics of each ethnic group are different from other ethnic groups, and these characteristics can be expressed in the unique way of thinking, language and behavior of that ethnic group. The understanding of nature and the universe is expressed in unique language expressions, unique performance styles and ways [12]. It contains historicity and inheritance. All of the above are the manifestations that culture has in terms of ethnicity. Thirdly, the inheritance path mainly adopts the teaching by word and example. What is more prominent in the inheritance of non-heritage is that it realizes the cultivation of the next generation of inheritors through the oral description of the previous generation of inheritors and demonstration, thus it has the collective and oral nature. Oral focuses on the oral form of performance skills, such as social etiquette, oral legends and folk knowledge of the universe and nature, etc.; collectivity focuses on the group form of performance of the inheritance of skills,

which are usually participated by the group or a number of natural persons, and in the process of development, constantly integrated into the inheritors of the thinking, improvement, so that the form of art continues to be enriched. Fourth, interest. There are mainly the benefits of the physical carrier and the benefits contained in the surrounding area, but also the benefits brought by the performance and other forms.

(2) Elements of intangible cultural heritage

(1) Time

The time here is random or periodic. It can also be said to be the time when a specific cultural event occurs.

(2) Location

The locations here are divided into two types, one refers to the natural part, which is a condensed presentation of traditional folk cultural activities, from the perspective of anthropology; the other refers to historical sites or landmarks, which can still be viewed from the perspective of cultural heritage. From a point of view, the place where the material remains is still there.

(3) Cultural origin

Cultural background includes life customs, religious beliefs, natural and geographical environment. Due to geographical, climate and other factors, people's living habits are very different, so they also have different religious beliefs and cultural backgrounds.

(4) Successor

They inherited the core of human space culture, possessing valuable skills and traditional culture. The inheritance and dissemination of intangible cultural heritage is passed on from generation to generation through the family tree of the heir, so that the thought, culture and skills of the heir can be continued. There is no shortage of good heirs among the heirs. These heirs may push the Chinese nation and culture at that time to the peak of history. Therefore, for thousands of years, heirs have always been a representative and important part of the Chinese nation's culture.

2.2 Intangible Heritage Handicrafts in the Yellow River Basin

My country has already included 40 items on the UNESCO Intangible Cultural Heritage List, ranking first in the world. Among them, a total of 32 "intangible cultural heritage" projects have been included in the human "intangible cultural heritage" representative list, 7 projects have been included in the list of urgently needed protection, and 1 project has been included in the list of good practices. It can be said that China's intangible cultural heritage has become an important force in promoting exchanges and mutual learning among civilizations.

The country's classification of intangible heritage mainly includes ten categories. The existence of intangible heritage is dependent on people. As a traditional culture, intangible heritage is also closely related to people's production and lifestyles in the process of inheritance, so it needs Human beings are used as the carrier to embody the "liveness". Because of this, the realization of intangible cultural heritage is also in various forms, including: scenes, singing and performance, manual skills, body movements, etc. Over the years, some heirs representing intangible cultural heritage are too old, and the number of heirs in a single project is small, which has become an important factor restricting the inheritance and development of intangible cultural heritage. According to tradition, representing heirs is usually an important way to inherit inheritance. At present, there are more than 3,000 representative heirs representing national intangible cultural heritage projects, but most of these groups are older and have fewer heirs. According to the age gap of the heirs, the Italian National Bureau of Culture nominated five groups of heirs representing the country's intangible cultural heritage items, a total of 3,068 people.

2.3 Digital Protection Platform Establishment Process

The process of establishing a digital protection platform needs to run an all-digital life cycle, which specifically includes six stages. First, we need to comprehensively excavate cultural resources and use various technical means to collect them from visual, auditory, tactile and other aspects. Second, we can use various technologies to process the collected resources, create classification and build different types of digital resource libraries. Third, we need to manage the digital resource libraries, including the creation of resource catalogs and multiple retrievals of resources. Fourth, the new digital technology and computer technology will be applied to deal with digital resources in the database. Fifth, we also need to select suitable media, disseminate processed digital products, and expand cultural resources impact.

2.4 Design of Digital Protection Platform

The establishment process of the digital protection platform is to carry out specific and independent operations from the technical level, and the design of the digital protection platform needs to be coordinated in the establishment process, and the two are carried out simultaneously. The intangible cultural heritage of our country is diversified. In its protection, a variety of technical means must be used to design a digital protection platform suitable for its development path. Regardless of the type of digital protection platform, the design must reflect the principles of intangible cultural heritage protection: static protection and live inheritance. Static protection refers to the recording and preservation of lost cultural heritage through photography, video, transcripts, etc. It is a museum-style preservation method, which is static and focuses on the preservation of the current development of culture and the preservation of development results. The design must ensure the authenticity of culture; living inheritance is a dynamic protection, focus on the environment for the formation of cultural heritage, and we also should pay attention to protection and inheritance of culture in the people's production and living environment to make culture more adaptable to social development and more vitality.

The construction of the intangible cultural heritage handicraft database of the Yellow River Basin is the core of digital protection. On the one hand, the database has powerful data storage and management functions, which can effectively convert a large number of text, pictures, sounds, images and scenes into digital resources, which is convenient for effective management. On the other hand, the database has the functions of information publishing and information access at the same time, providing systematic information resources for the audience, and providing support for the research and practice of intangible heritage handicrafts in the Yellow River Basin. Digital preservation is usually carried out by libraries, cultural centers, museums and other official institutions. Computers, networks and other technologies are used to programmatically manage all the information resources of intangible cultural heritage in the Yellow River Basin. Digital resource archiving, indexing, description and other databases, integrated information system. For the audience to provide resource search queries and sharing exchanges. In the process of building or supplementing the network database, the administrator can modify, edit, delete and supplement the information that has changed, and can freely adjust the arrangement order and so on. After the database is built, the audience can retrieve and call information materials quickly and conveniently. Network information data is vast, and information can be easily accessed through digital terminals without being restricted by time or space. Audiences can obtain required information through digital terminals at any time and any place, realizing information sharing and exchange of intangible heritage craftsmanship in the Yellow River Basin.

3. Research and Investigation on the Digital Inheritance and Development Path of Intangible Heritage Handicraft in the Yellow River Basin

3.1 Overview of the study area

Gansu's intangible cultural heritage is rich in resources, deep in deposits, with a large number of remains and unique characteristics. According to the statistics, there are 83 items and 68 inheritors of national level ICH in Gansu Province on the list of masterpieces of national level ICH and the list of extended items. There are 495 provincial intangible cultural heritages with 617 inheritors, 2,107 city and state level projects with 3,036 inheritors, 5,241 county and district level projects with 7,814 inheritors.

The total area of Gansu along the Yellow River basin is 145,900 square kilometers, accounting for 34.3% of the total area of the province. The main stream of the Yellow River flows through 4 cities and prefectures of Gannan, Linxia, Lanzhou and Baiyin, with a length of 913 kilometers, accounting for 16.7% of the total length of the Yellow River; the tributaries of the Yellow River flow through 5 cities, namely, Dingxi, Tianshui, Pingliang, Qingyang, and Wuwei, and the population and GDP along the Yellow River Basin of Gansu accounted for about 80% of the province's population and the GDP of the whole province, and 357 provincial-level NRHs along the Yellow River Basin of Gansu province accounted for 72.3% of the province's NRHs resources (Figure 1).

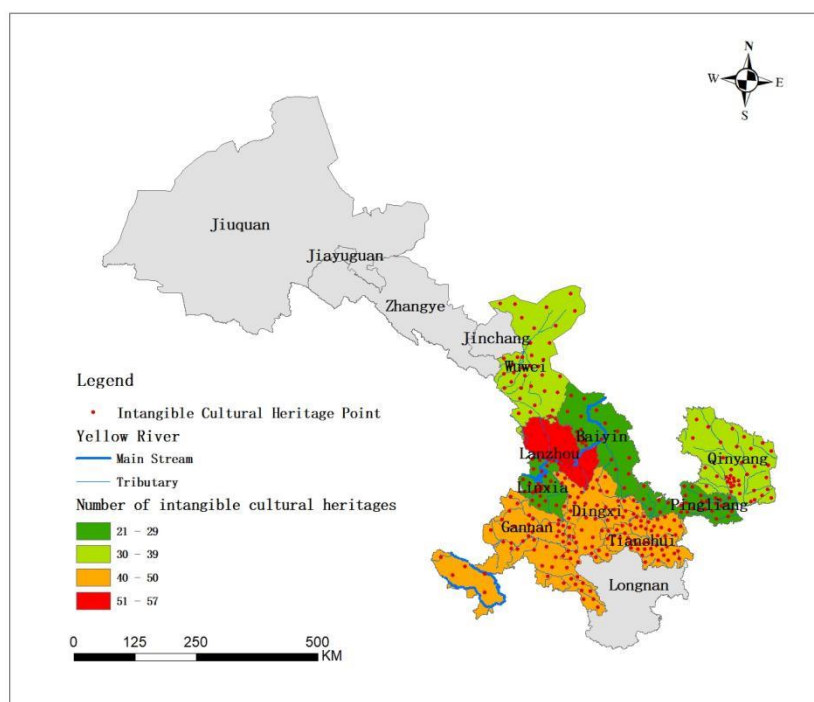


Figure 1: Distribution of Intangible Cultural Heritage in the Yellow River Basin

3.2 Research Methods

In this paper, field research is carried out in Gansu Province to understand the inheritance status of non-heritage handicrafts in the Yellow River Basin; a large number of text, pictures, audio and video digitized data needed for the study are collected, and the data collected by the research lays the foundation of the study. On the basis of the field research, the issues related to the digital

protection of the non-heritage handicrafts in the Yellow River Basin are analyzed in depth. The audience of the questionnaire is mainly three groups of people: college students, inheritors of Yellow River Basin non-legacy handicrafts and social figures. School students love to pursue new things, mostly interested in new media, and as a young generation, they are the core group of non-legacy handicrafts in the Yellow River Basin that are being lost. The inheritors of the Yellow River Basin non-heritage handicrafts are good at the non-heritage handicrafts in the Yellow River Basin and familiar with the historical lineage and cultural characteristics of the non-heritage handicrafts in the Yellow River Basin, therefore, they can provide suggestions for the APP design of this paper in terms of content and form.

3.3 Data Collection

A total of 230 questionnaires on the inheritance of intangible cultural heritage handicrafts in the Yellow River Basin were distributed, of which 15 were invalid and 215 were valid. A total of 260 questionnaires on the needs of users of the intangible heritage handicraft APP were distributed, of which 10 questionnaires were invalid and 250 were valid. This article will finally receive the valid questionnaire into a histogram for data analysis.

3.4 Data Processing and Analysis

This article uses SPSS 22.0 software to count and analyze the results of the questionnaire, and conduct a t test. The t-test formula used in this article is as follows:

$$t = \frac{\bar{X} - \mu}{\frac{\sigma X}{\sqrt{n}}} \quad (1)$$

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2} \left(\frac{1}{n_1} + \frac{1}{n_2}\right)}} \quad (2)$$

Among them, formula (1) is a single population test, s is the sample standard deviation, and n is the number of samples. Formula (2) is the double population test, and the sum is the sample size.

4. Research and Analysis on the Digital Inheritance and Development Path of Intangible Heritage Handicrafts in the Yellow River Basin

4.1 Analysis of Inheritance of Intangible Heritage Handicrafts in the Yellow River Basin

Appropriate means are chosen according to the characteristics of the non-heritage handicrafts in the Yellow River Basin in the process of digital protection and inheritance of the non-heritage handicrafts in the Yellow River Basin. Using SPSS 22.0 software to count the results of the questionnaire survey: there are more people who know less and don't know at all about the non-heritage handicrafts of the Yellow River Basin, and the total proportion reaches more than 70%, as shown in Figure 2. It shows that the current situation of the inheritance of non-heritage handicrafts in the Yellow River Basin is not too optimistic. But happily, more than 90% of the people think that it is very necessary to inherit the Yellow River Basin non-heritage handicrafts, as shown in Table 1. This shows that it has great social recognition and traditional culture has a pivotal position in people's mind. From the data results, it can be seen that more than half of the

respondents are more concerned about the cultural connotation of non-heritage handicrafts and manual teaching, and these two main elements will be the necessary elements in the APP design after this paper.

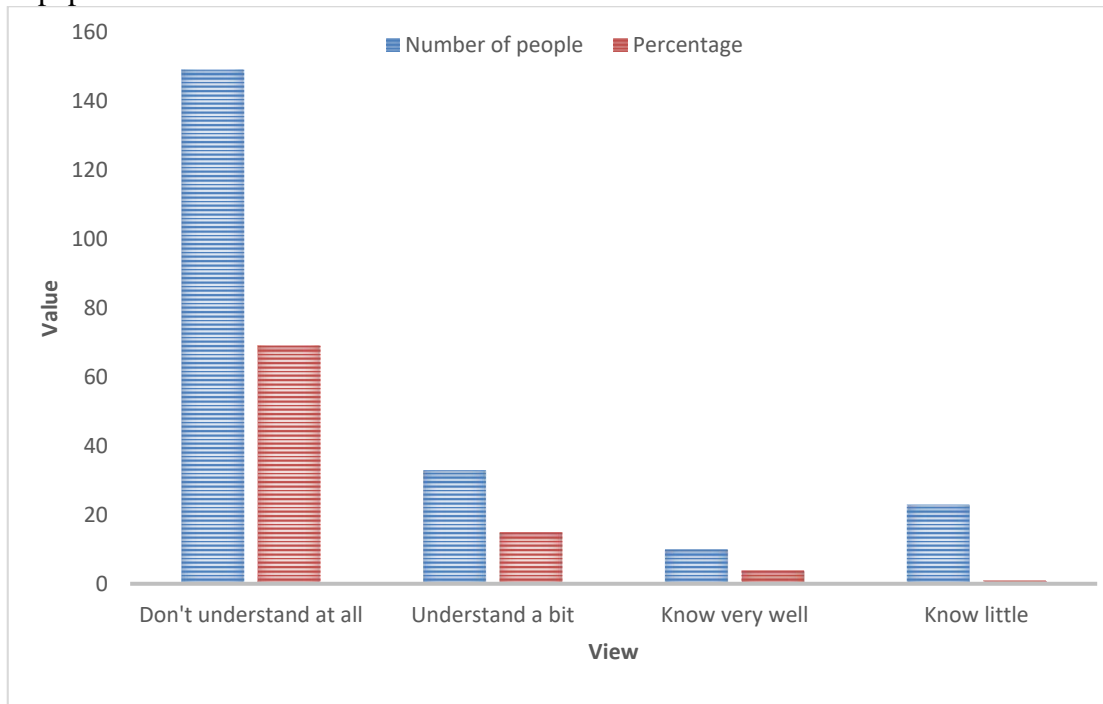


Figure 2: Whether the interviewee knows about the intangible heritage handicrafts inherited from the Yellow River Basin

Table 1: Whether interviewees think it is necessary to inherit intangible cultural heritage handicrafts in the Yellow River Basin

| | Do you think it is necessary to inherit the intangible heritage handicrafts of the Yellow River Basin? |
|-------------|--|
| Necessary | 92% |
| It's ok | 7% |
| Unnecessary | 1% |

The basic conclusions of the questionnaire on the user requirements of the APP for non-heritage handicrafts in the Yellow River Basin are as follows: people who use cell phones for about 2 hours a day accounted for 3.2%, those who use cell phones for about 3 hours accounted for 7.6%, those who use cell phones for about 4 hours accounted for 42%, and those who use cell phones for 5 hours or more accounted for 47.2%, so it can be seen that the majority of people who participated in this survey use cell phones for a long time every day, and it would be effective to use cell phone APPs to implant elements to inherit non-heritage handicrafts. It will be effective to utilize the elements implanted in the mobile phone APP to inherit the non-legacy handicrafts in the Yellow River Basin.

The survey shows that people are more inclined to the presentation of APP is graphic and text with video and audio, it is obvious that a single picture and text can't satisfy people's demand for APP, and the combination of various forms of expression is the basic element of APP products. To sum up, the design of APP of Yellow River Basin non-legacy handicrafts in the later stage of this paper will be mainly "flat", not emphasizing its style characteristics, adopting simple and

easy-to-use interactive methods, showing the connotation of specific non-legacy handicrafts of the Yellow River Basin and teaching by hand.

4.2 Interactive Analysis of the Content of the Digital Teaching System of Intangible Heritage Handicrafts in the Yellow River Basin

The content design of the new media digital teaching system should be a combination of theoretical lectures plus design practice. The content mainly includes: cultural background introduction of non-heritage handicrafts in the Yellow River Basin, learning and decomposition of non-heritage handicrafts in the Yellow River Basin, teaching concept of non-heritage handicrafts in the Yellow River Basin, and virtual teaching classroom of non-heritage handicrafts in the Yellow River Basin. Firstly, in the part of cultural background introduction of non-heritage handicrafts, two modules will be used to introduce, one of which is to introduce and show traditional culture through words and pictures, and the other is to let learners feel non-heritage handicrafts more realistically through the virtual experience of non-heritage handicrafts in a living state. In the part of learning non-heritage handicrafts, the characteristics of non-heritage handicrafts are analyzed through cases, and the inheritors of non-heritage are invited to join in the discussion and learning with the inheritors through the way of dialogue with the inheritors in the space. We will also break down and store the manual steps of the non-heritage handicrafts, so as to prepare for the step-by-step teaching in the future. The last part is our virtual studio for teaching non-heritage handicrafts, with virtual exercises, which can integrate the learned manual principles and steps after breaking them down and practicing them again, and also virtual application demonstration of self-practice in the 3D virtual application part. The design of the whole content consists of theoretical and practical parts, which are also interspersed with virtual experience, and the combination of various means builds up a digital teaching system of non-heritage handicrafts.

The interactive structure of the digital teaching system unfolds from the content of the system. The content of the whole system is realized in a three-dimensional and cross-cutting way. The cultural background of non-heritage handicrafts mainly includes: the living environment of the inheritors of non-heritage handicrafts, the cultural origin of non-heritage handicrafts, the cultural origin of non-heritage handicrafts, and the teaching video of non-heritage handicrafts. Characteristics of non-heritage handicrafts include: style and process. Principles include: handcraft, composition, and color palette. The virtual studio includes: two-dimensional teaching of non-heritage handicrafts, three-dimensional self-practice, and so on. And these are the latitude in the content interaction, a horizontal relationship. From this kind of introduction, the cultural connotation of non-heritage handicrafts, non-heritage handicrafts handmade awareness, learning principles, non-heritage handicrafts virtual teaching classroom is carried out downward is the warp in the content interaction structure. The whole structure of content interaction is formed by the interweaving of horizontal lines and vertical contents, as shown in Figure 3.

In this way, a digital teaching system of intangible heritage craftsmanship is formed with a variety of means. The presentation form of the teaching system is not limited. It can be presented as an APP platform, or based on a website, or even added to the teacher's lesson preparation. The purpose of constructing the digital teaching system of intangible heritage handicrafts is not only to provide convenience for students' manual learning, but also to provide services for the protection and inheritance of intangible heritage handicrafts.

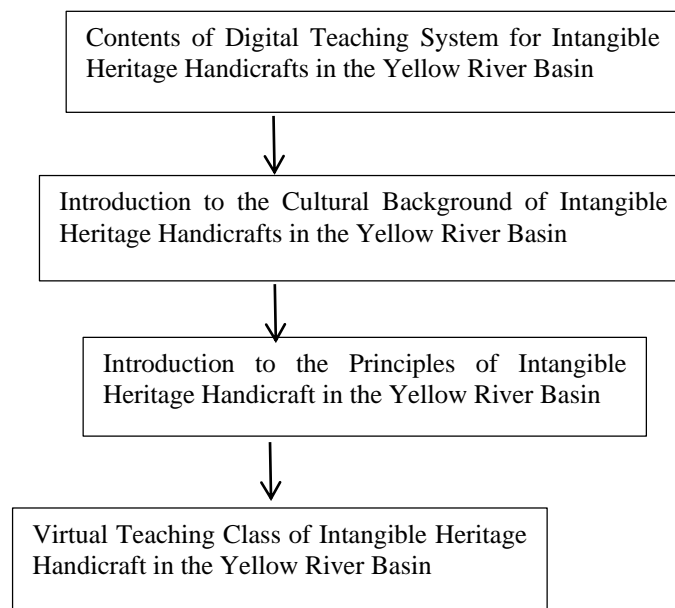


Figure 3: Interactive structure design of the digital teaching system of intangible heritage handicrafts in the Yellow River Basin

5. Conclusions

With the advance of globalization and the continuous innovation of technology, intangible cultural heritage is facing difficulties in survival. The traditional means of communication can no longer adapt to the current communication environment, and it is difficult to achieve the desired effect of communication. At present, the advantages of adopting digital technology for conservation over traditional means are as follows: First, storage flexibility. Science and technology continue to develop, storage data format, carrier and capacity have made great progress, non-heritage resource storage rely on electronic records to become the main way of storage, such progress liberates the space required by the original way, reduces the cost of storage, and facilitates the management of the advantages; secondly, dissemination is rapid. After adopting digital technology to record the formation of resources, there are greater advantages in the efficiency of data organization and transmission in the network; third, the application prospect is wide. Digitization technology records a large amount of data, covering a lot of content, so that the flexible use of data becomes possible.

In this paper, the use of digital technology protection means for the protection and inheritance of non-heritage handicrafts has been effective, thanks to the rapid development and rational use of digital technology, and the timely discovery of effective ways of protection and inheritance. This paper is oriented to the inheritance of non-heritage handicrafts, and after reviewing and accumulating relevant literature on traditional folk crafts, non-heritage handicrafts production techniques, and the protection of intangible cultural heritage, it determines the outline of the research interview; summarizes the inheritance and development dilemma of non-heritage handicrafts through the field research, and puts forward and elaborates the specific ways of digital protection methods, and then verifies the feasibility of digital protection ways through the design of the APP with a topic of non-heritage handicrafts. Then the feasibility of the digital protection way is verified through the APP design with the theme of non-heritage handicrafts, and the theory is combined with practice to a certain extent, and finally the conclusions and suggestions of this study are drawn.

Acknowledgement

Gansu Provincial Social Science Project "Research Path of Inheritance Development and Rural Revitalization of Non-Legacy Handicrafts in the Yellow River Basin of Gansu.
(Project No. 20YB106)

References

- [1] Guzman P C, Roders A, Colenbrander B. *Measuring links between cultural heritage management and sustainable urban development: An overview of global monitoring tools [J]. Cities*, 2017, 60(Pt. A):192-201.
- [2] Hong M, Jung J J, Piccialli F, et al. *Social recommendation service for cultural heritage[J]. Personal & Ubiquitous Computing*, 2017, 21(2):191-201.
- [3] Dragoni M, Tonelli S, Moretti G. *A Knowledge Management Architecture for Digital Cultural Heritage [J]. Journal on Computing & Cultural Heritage*, 2017, 10(3):1-18.
- [4] Ganzaroli A, Noni I D, Baalen P V. *Vicious advice: Analyzing the impact of TripAdvisor on the quality of restaurants as part of the cultural heritage of Venice [J]. Tourism Management*, 2017, 61(AUG.):501-510.
- [5] Galeazzi F. *3D recording, documentation and management of cultural heritage [J]. International Journal of Heritage Studies*, 2017, 23(7):1-3.
- [6] Nicu I C. *Tracking natural and anthropic risks from historical maps as a tool for cultural heritage assessment: A case study [J]. Environmental Earth Sciences*, 2017, 76(9):330.
- [7] Serena A, Elisa F, DE Micaela, et al. *Poly (hydroxyalkanoate)s-Based Hydrophobic Coatings for the Protection of Stone in Cultural Heritage[J]. Materials*, 2018, 11(1):165.
- [8] Brancati N, Caggianese G, Frucci M, et al. *Experiencing touchless interaction with augmented content on wearable head-mounted displays in cultural heritage applications [J]. Personal & Ubiquitous Computing*, 2017, 21(2):1-15.
- [9] Mcmanamon F P, Kintigh K W, Ellison L A, et al. *tDAR A Cultural Heritage Archive for Twenty-First-Century Public Outreach, Research, and Resource Management [J]. Advances in Archaeological Practice*, 2017, 5(03):238-249.
- [10] Backman M, Nilsson P. *The role of cultural heritage in attracting skilled individuals [J]. Journal of Cultural Economics*, 2018, 42(1):1-28.
- [11] Kobayashi T, Perras F A, Murphy A, et al. *DNP-enhanced ultrawideline 207Pb solid-state NMR spectroscopy: an application to cultural heritage science [J]. Dalton Trans*, 2017, 46(11):3535-3540.
- [12] Cao D, Li G, Zhu W, et al. *Virtual reality technology applied in digitalization of cultural heritage[J]. Cluster Computing*, 2017, 22(4):1-12.