Digital Preservation and Presentation of Institution Photo Archives: the Anhui University Memory Project Experience

Lichao Liu[1,2], Shushu Zheng[1], Li Niu[1,2], Luolin Wang[1]

[1] School of Information Resource Management, Beijing, China
[2] Humanities Beijing Research Center, Renmin University of China, Beijing, China
liulichao@ruc.edu.cn, ruc_shushu@ruc.edu.cn, rucniuli@gmail.com,
wll@ruc.edu.cn

Abstract. Institution photo archives are important digital resource with a large proportion of old photos, which makes them of great value in aspects of history and culture. Based on OAIS (Open Archival Information System) Model, the Anhui University Memory Project (AMP) designed and realized a Long-term Preservation Process, which included a series of standard procedures for lifecycle management. Then digital resource repository and digital memory site were developed according to demands of Anhui University for constructing and presenting memory. This paper aims to introduce the architecture and achievements of AMP, as well as the design and implementation of long-term preservation process and two distinctive ways of resource organization and memory presentation.

Keywords: Digital Photo Archive, Digital Preservation, Digital Presentation, OAIS Model, Memory Construction.

1   Introduction

Photo archives can be divided into traditional and digital by its carrier. Traditional carrier photo archives consist of negatives, photos and text descriptions, while the formation, transmission and storage of digital carrier photo archives rely on digital images, computer hardware and software devices. With the advancement of digital means and the popularity of personal photography, digital photos have become an important medium for people to record and transmit information in social production and daily life, and a commonly used information carrier, which is of great value for documenting history and inheriting culture. However, there is a long way to go to promote the effective management and utilization of photos. For one thing, the value of digital photo is influenced by their integrity, quality, clarity, etc. For another, difficulties of managing digital photos has been increased because of the number of them is increasingly growing. Therefore, to make better use of the value of photos in the future, it is necessary to properly preserve and manage digital photos in a timely manner.

For Anhui University, which has a history of 90 years, a large amount of photo resources will inevitably be produced during its campus construction, personnel management, academic research and other activities. As to those photos produced in years when photography is not common and remained, more attention should be paid to the long-term preservation of them for developing their values.

AMP was launched at the time of the 90th Anniversary Celebration of Anhui University. It was jointly implemented by Anhui University Archives and School History Museum and Information Resources Management School of Renmin University of China (IRM), which is one of the celebrations of Anhui University. The photo archive resources used in AMP were provided by Anhui University Archives and have been digitalized. IRM is responsible for the design and solution of the overall architecture of AMP. Before AMP, IRM has achieved some certain research results in digital humanities, urban memory and other related research fields. One of the most representative achievements is "Beijing Memory Project" (Niu & Jiao, 2017).

AMP aims to preserve digital photos over the long term through digital resources long-term preservation theory and technology, and realize the development and utilization of photo resources by organizing, processing and managing digital photos. This paper will first briefly introduce the overall architecture of AMP, and then focus on the long-term preservation of digital photos and distinctive ways of constructing digital memories. In the final conclusion, we provide an idea of digital archives management and utilization according to the experience of AMP.

2   The Architecture Designed for AMP

The design of the architecture of AMP mainly considered two factors: one is the requirements for memory construction in storage, management and utilization of photo resources, and the other is the multi-dimensional analysis of photo resources provided by Anhui University Archives. As Figure 1 shows, the memory construction program of Anhui University consists of three parts: photo management, resource organization and display settings.

Photo management is the foundation of memory construction. In this part, necessary functions such as processing of photo information, long-term preservation of digital photos, and photo resource acquisition are required. The resource organization section shows two ideas for memory construction. To implement these two ideas, functions like geographic location management should be set up in photo management part to lay the foundation for display settings. Five distinctive content columns based on the two ideas are designed in display settings part, to show the culture and history of Anhui University and build Digital Memory Site for Anhui University.

After the architecture was put into practice, we summarized the results as "One Repository and One Site". "One Repository" refers to the Memory Repository and "One Site" refers to the Anhui University's 90th Anniversary Digital Memory Site.
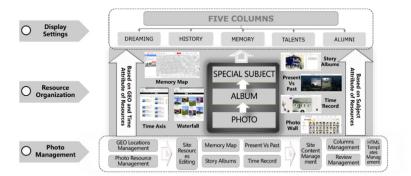
Fig. 1. The architecture designed for AMP

2.1 The Memory Repository

The Memory Repository is not only a storage repository of digital resources, but also a production factory of memory resources. In Memory Repository, all the works from submitting digital photos to forming digital memories, can be divided into long-term preservation of digital photo archives and content management. After being uploaded to the system, the digital photo archives will go through metadata description, information encapsulation and other steps to form information packages, which are materials of content management. In the content management part, scattered digital photos will be gathered into posts, albums and special topics after being edited and clustered.

2.2 The Digital Memory Site

The Digital Memory Site is a platform for digital presentation of memory resources. In the architecture designed for AMP, the memory content of the Digital Memory Site of Anhui University is divided into five columns. The determination of themes of columns is based on the analysis of photo resources. The site shows the history and culture of Anhui University from the content of school history, campus environment, famous alumni, school culture, outstanding elder generation, etc., and fully expresses the connotation value of photo archive resources in the repository.

2.3 The Software System Architecture

The software system architecture is divided into three parts: infrastructure architecture, memory repository and digital memory presentation. Usually, digital photos will be submitted to "Data Preservation" section of the Memory Repository for long-term preservation through metadata description, content review, and data encapsulation. But users can also upload photos in the "Memory Construction" section. In this way, the system will automatically complete a series of steps before realizing the long-term preservation of digital photos, which could improve the efficiency of constructing memories. The "Memory Construction" section is similar to a content management system to some extent, but it is not just a content management system. Functions like

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resource editing, column management, and geographic location management are all designed to meet the needs of digital memory presentation. In the process of building memory, third party database like Baidu, Wikipedia and CBDB may be used. In addition, system management functions such as user management, log monitoring, and system configuration to ensure a well-controlled system are also indispensable.
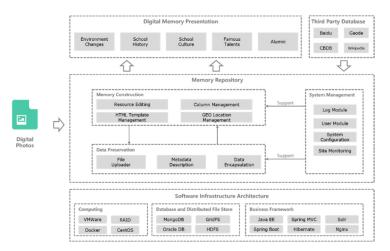

Fig. 2. Software System Architecture of AMP

3 The Long-term Preservation Realized by Memory Repository

Memories presented by Digital Memory Site should first be authentic, and considering that digital photo archive resources are the basis for memory construction of Anhui University, it is necessary to ensure the authenticity of photos and the accuracy of their description information. However, the number of digital photos is huge and photos are highly dependent on their storage environment, which means problems like loss or damage of photos are prone to happen without effective management (Dong & W., 2017). In addition, annoying things like media failure, obsolescence of software and hardware, network error and so on may also occur. Therefore, we have to realize the long-term preservation of digital photo archives and manage them effectively to ensure their effectiveness, integrity and reliability.

On the basis of OAIS (Open Archival Information System) Model, we designed and realized the long-term preservation process for Memory Repository. Important concepts like SIP (Submission Information Package) and AIP (Archival Information Package) were introduced (Fu, Wu, & Wang, 2014). Information package consists of content information, which means the resource itself, and preservation description information, which is the record and description of production environment, background and so on. As we can see from Figure 3, SIP and AIP are important digital objects produced in the process. SIP is designed for resources provider and AIP is the object to be preserved

over the long term. It has been proved that using information package could contribute to management, development and utilization activities of digital resources and ensure them traceable. Besides, data migration and distribution will become easier since we use AIP as long-term preservation objects (Raventos & Roca, 2016).

In Memory Repository, the long-term preservation process starts with stage of metadata description. After external and internal features of digital photos are described and revealed based on certain metadata schema, SIP will be produced. Then comes to resource verification, a stage designed to verify the quality of SIP. SIP failed to meet the long-term preservation requirements will be rejected while SIP passed this stage will enter data encapsulation stage. When AIP is produced and stored, the long-term preservation process of the Memory Repository is finished (Wilson, 2006).
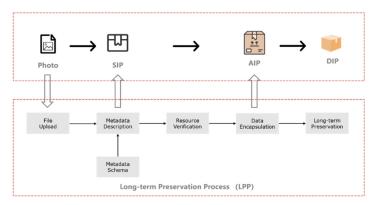

Fig. 3. Long-term Preservation Process

4 Distinctive Organization and Presentation Ways of Photo Archives

In the absence of context, the interpretation of a single photo varies from person to person, and it is far from enough to construct memories by using a single photo. Moreover, compared with using pieces of disorganized photos to present the culture or history of a group or an institution, it is much more impressive and expressive by using well-organized albums. With this in mind, digital memory of Anhui University should be constructed on the foundation of effective organization of digital photos.

After we fully analyzed the composition of photo resources provided by Anhui University, we created some distinctive organization and presentation ways of digital photo archives. Here are the two most important ways we construct digital memory: one is based on time information and geographic information of digital photos and the other is based on subject information. Under the guidance of these two thoughts, we organized scattered photos into albums and then build them into special memories (Jerkov & Milnovic, 2017).

4.1 Organized and Presented Based on Time and Geographic Information

For a university that has gone through 90 years, changes in the campus environment, campus construction is a very important part of its history and photos are the most intuitive record of them. In order to embody these changes, corresponding functions like geographic locations management were developed in Memory Repository to gather digital photos into albums and presented them based on time and geographic information. As a result of taking this way to organizing resources, we designed and developed a presentation mode called "Memory Map".

Fig. 4. Memory Map

4.2 Organized and Presented Based on Subject Information

Subject information is a highly condensed summary of the content of photo and it is set required in the stage of metadata description in the long-term preservation process. To lay the foundation for memory construction based on subject information, we set an attribute called Resource Tags, which is required when cataloguers describe metadata information for photos, and developed a function called resource tag management so that cataloguers only need to select tags from the preset collection of resource tags. Therefore, photos can be divided into different sets more efficiently. Among numerous subjects of digital photos archives, campus culture, school building, graduation photos and academic research are the most representative ones. And we developed some distinctive presentation modes such as photo walls, story albums, present and past, time record and so on to present these subjects.
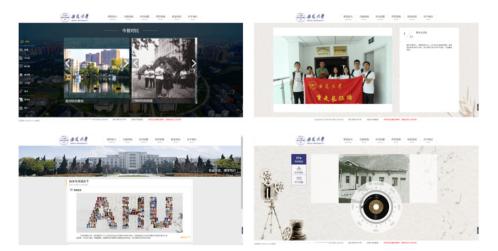
Fig. 5. Presentation Modes Based on Subject Information

5   Conclusions

This paper provides an idea of digital archives management and utilization base on the theoretical research and practice achievements of AMP. That is, on the foundation of managing digital archives effectively and preserving them over the long term, construct development and utilization platforms for specific demands. AMP is exactly an impressive example of this idea. In AMP, a lifecycle management process was designed and realized for digital photo archives based on OAIS Model at first. And after adequate analysis of Anhui University's demands, we built an efficient memory construction system and a digital memory site that presents memory resources distinctively.

In summary, AMP was a successful exploration about digital preservation and digital presentation, which combined long-term preservation of digital resources with memory construction and developed Memory Repository and Digital Memory Site. As a presentation platform, Digital Memory Site has been recognized by alumni of Anhui University since it was launched.

Acknowledgements

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