The Value-added Application of Taiwan's National Digital Archives Program (NDAP)

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Abstract

In Taiwan, the National Digital Archives Program (NDAP) was established in 2002. The premier aim of the NDAP is to execute the digitalizing through the view points of national digital repositories. The digital content of the NDAP includes the collection of libraries, archives and museums, and is willing to showcase the diversities and uniqueness contexts of Taiwan society and natural environment. The NDAP now has entered into its second phase. The aim of the NDAP's second phase is to apply digital content and information technology in the fields such like industry, education, research and social development. The valued-added and application of the digital archives is becoming a cardinal issue among all institutes which involve in the NDAP. This paper mainly focuses on the value-added application of the NDAP, five types can be categorized as the following: 1. Digital Content Services; 2. Knowledge Context Services; 3. Instructive Information Services; 4. Leisure Information Services, and 5.Portal Information Services. We will recite the products and outputs from every kind of application model.

1. Introduction

Since 1990s, as the great development of the internet and World Wide Web (WWW), the Internet provides the three major functions as the following: E-mail, remote connectivity, and the profile transmission. The WWW provides a multi resources environment. Not only the textual document information, but also the multimedia such like vocal message, video, icon, and animation can be transmitted through the Internet. The web environment with the hyperlink function is popular used in today's world. Besides, the development of the digital technique, the information services such as world digital library and digital museum are becoming critical knowledge nodes of the WWW.

In order to digitize and preserve the precious cultural heritage of the nation, Taiwan government has already invested a huge amount of resources to achieve this goal. The National Digital Archives Program (NDAP), which was established in 2002, is a national program which gives consideration and tries to combine both science and humanity field. The premier aim of the NDAP is to execute the digitalizing through the view points of various national digital repositories. The digital content of the NDAP includes libraries, archives and museums, and the aim of the program is willing to showcase the diversities and unique cultural and natural heritage of this beautiful island to the whole world.

The NDAP now has entered into its second phase. In order to highlight the Taiwanese culture as a major subject of the society, and to transform digital information into the basic elements of the construction of the knowledge society, the aim of the NDAP's second phase is to apply digital content and information technology in the fields such like industry, education, research and social development. The digital archives and knowledge can play an important role in the fields such as development of humanity, society, industry and economics of Taiwan. These efforts could also be shared with the international community and help to promote the cooperation and understanding between different cultures. Therefore, the value-added and application of the digital archives is becoming a cardinal issue among all institutes which involve in the NDAP.

2. NDAP in Taiwan

The National Digital Archives Program (NDAP), which was officially launched in January, 2002, has been restructured with the focus on national development as a whole. Its establishment was based on the experience gained through the implementation of three earlier projects sponsored by the National Science Council, namely, the Digital Museum Project, the National Archive Digitization Program, and the International Digital Library Cooperation Plan. It is the only national science and technology program that places emphasis on the humanities and social sciences. The scope of the digital archives program can effectively enhance the accumulation, dissemination, and application of knowledge, and thereby serve as a key link between different sectors of the knowledge-based economy.[1] The national repositories and research institutes such like National Palace Museum, National Taiwan University, National Science Museum, Academia Sinica, National Central Library, Academia Historica, National History Museum, Taiwan Historica, are all participate in the NDAP.

With the active participation of the NDAP Program Office and various domestic archives repositories, such as libraries, museums and archives, NDAP Phase I (2002-6) digitized selected representative cultural assets. The project not only preserved many important information assets for cultural and academic research, but also helped establish the metadata standards and specifications for the program.

The Union Catalog of Digital Archives,[2] which is based on the efforts from the first phase of NDAP, not only contains more than one million archived items, around 2 million metadata and 1.5 million images, but also provides the free searching function to the public worldwide. The catalog offers comprehensive search modes for items with distinctive features, a quick guide, thematic

classifications, and an index of archival repositories. It can also serve as a value-added catalog for education, research, and industrial applications.

Digital archiving is a lifetime work dedicated to the enhancement of the nation's cultural and technological competitiveness in the information age. To consolidate and build on the successes achieved to date, NDAP Phase II was launched in 2007. Its primary purpose is to foster indigenous values, demonstrate Taiwan's cultural diversity, and showcase the cultural uniqueness of Taiwan. The overall objectives of NDAP - Phase II can be divided into three major categories:

(1)To showcase Taiwan's biological, cultural, and social diversity.

(2)To promote the cultural, academic, socio-economic and educational values engendered by the NDAP.

(3)To develop an international cooperation and exchange network, and promote awareness about Taiwan's cultural heritage.[3]

In order to highlight the subject of Taiwanese culture, and to transform digital information into the efforts of knowledge society, the aim of the NDAP's second phase is to apply digital content and information technology in the fields such like industry, education, research and social development. Therefore, value-added and application of the digital archives is becoming a cardinal issue among all institutes which involve in the NDAP.

In 2008, the NDAP is merged with the National Science and Technology Program for e-Learning. The TELDAP (Taiwan E-Learning and Digital Archives Program) is the production of mergence. Through the mergence of the e-learning and digital archives program, the two different programs can have further corporation, especially in the application and the service of the value-added solution of the e-learning which are based on the contents from the production of the digital archives program.

3. Taxonomy for Value-added Application of Digital Archives

The main purpose for this paper is to construct a classificatory scheme for digital archives in Taiwan. The advantage gained by classifying objects of interest in taxonomy is that like properties of a class of phenomena can be identified for comparing and contrasting classes. There should be decision rules, which hopefully are simple and parsimonious, and to assign instances to classes and the classes should be mutually exclusive. In addition, as taxonomies are proposed to aid human understanding, we would like the classes to be easily understood and to appear the natures of the knowledge.[4]

We have reviewed a number of methods that have been proposed for the construction of taxonomies. The classification system proposed resulted from an iterative process, and refinement of an analytic classification method that distinguished among the classes of digital archives on the basis of their important attributes.

The method for classifying digital archives proposed here begins with the primary goals of the value-added application. In the classification schemes that propose typically are defined by the attributer of the phenomena. Such categorization schemes as frameworks or typologies attempt to simplify and organized the world in ways that highlight possibly consequential relationships between the phenomena and the outcomes of inters.[5]

This paper presents the digital archives process in a systematic way following the "input-processing-output" approach. "Process" is defined in the context of this work as sequential steps of activities. Following this approach, we suggest a three-step process to analysis categories on value-added application of digital archives.

(1) Input: libraries, archives, and museums are inclusive. The types of the database are books, journals, manuscripts, archives, paintings, artifacts, rubbings, animal and plant species, and the spatial image information.

(2) Process: establish the metadata of the information – describe the content, context, and the relationship of each data. The digitalized image, full-text, reference information and the notation should also be provided in the database.

(3) Output: the databases, information systems, multimedia, and websites are the production of the digital archives.

Therefore, the value-added production and services can be analyzed according to its' information level, target users and the purposes. Through the analysis, the taxonomy of NDAP can be established. At first, we may discuss the definition of the contents of the production of NDAP. The content can be defined by different levels like data, information and knowledge. The data stands for the fact and presented by the texts, numbers, figures, and symbols. Information is the message which has been processed and promoted to the users. Through the information, the uncertainty of the data can be eased. Knowledge is not only the understanding toward the reality, but also the human general reaction toward the outside world. The systematic, theory and the university are emphasized and the basement of the knowledge. Secondly, the target users can be categorized as the following: teenagers, college students, the general publics, and researchers. Depend upon the characteristics of different target users, the demand and information action can be different from each group of target users. The ultimate goal of the digital archives is not only to preserve the cultural heritages, but also to provide a mature information service to the publics. Thirdly, we have to define the purposes of the application of digital archives. With the application of digital archives, the culture leisure, academic research, social economic and the education fields can be promoted.

Before we discuss these five types of valued-added application, the analysis and classification scheme, the frameworks (or the taxonomies), the view of input-process-output theory, and the importance of systematic should be considered in our accordance of the division for the categories of the value-added application of the NDAP.

To sum up the value-added application of the NDAP of Taiwan, the five types of features can be categorized as the following: 1. Digital Content Services; 2. Knowledge Context Services; 3. Instructive Information Services; 4. Leisure Information Services, and 5.Portal Information Services. We will recite the products and outputs from every kind of application model. According to the five value-added application models, we may sum up the databases and information systems of the NDAP

projects. We would like to introduce the related projects, the range of the content, the application, and the related features of each database.

3.1 Digital Content Services

The two basic aspects of digital archives are as the following: the digital collection and the digital service (to promote the open use, retrieve, analyze and choice). Therefore, the first type of the value-added application of the NDAP is the Digital Content Services, like descriptive database (metadata and digital image) and the full-text database (full-text and digital image). Here are the examples of the Digital Content Services:

- **The Documents from Damsui and Hsinchu Online Database**

  Institution/Project: National Taiwan University.

  Content: The Documents from Damsui and Hsinchu, the manuscripts of Ino Kakyo, the Rubbings of Taiwan Tablets, the Tashiro Library, the Taiwanese Opera Volume, the Valery Sergei de Beausset Library are the measurable collection of the National Taiwan University. These images and text collections are already digitized. The contents of each volume have also been ascertained and punctuated. The database metadata has already established so far.

  Website: http://140.112.113.4/project/database1/index.htm

- **Taiwan Archival Information System**

  Institution/Project: Institute of Taiwan History, Acadmia Sinica

  Content: This database embodies historical records, private manuscripts, official documents and book collections collected by Institute of Taiwan History. The formats of the resources include physical and digital manifestations.

  Website: http://tais.ith.sinica.edu.tw

The features of Digital Content Services are:

(1) Product contains：metadata and digital images;
(2) Target users：college students, researchers, and scholars;
(3) Goals：provided for retrieve, select, evaluate, and access information.

3.2 Knowledge Context Services

The humanity and biology are the two major fields which are inclusive in the content of the digital archives. The executors of the NDAP project are the experts and senior researchers of every specific field. The digital knowledge which is developed from the research and the digital archives are the major production of the digital archives. Therefore, the second type of the value-added application of the digital archives is the so called Knowledge Context Services. The names authority knowledge base, the Flora of Taiwan and the diary full-text annotation knowledge base are the examples of the Knowledge Context Service. Here is the example of the Knowledge Context Services:

- **The Database of Persons in Ming-Qing Dynasty**

  Institution/Project: Institute of History and Philology, Academia Sinica

  Content: The brief biography of person in Ming-Qing Dynasty. The basic information of each person is as the following: name, birthday, birthplace, brief biography and relative people. The reference of information will be offered in order to help users to research the original materials.

  Website: http://archive.ihp.sinica.edu.tw/mct/index.htm

The features of Knowledge Context Services are:

(1) Product contains：it is not only the content of the information, but also the container of the knowledge context and the relationship;
(2) Target users：students, researchers, and scholars;
(3) Goals：search on the facts, and the reference for research.

3.3 Instructive Information Services

Because the combination of the digital content services and the knowledge context services the application of e-learning is the third type of the value-added application of digital archives, which is so called Instructive Information Services. Education workers can apply the benefits of the digital environment, web teaching and the interactive learning activities, and design the digital learning courses for specific target users. Here are the examples of the Instructive Information Services.

- **The National Palace Museum e-learning**

  Institution/Project: National Palace Museum.

  Content: There are already plentiful topics which are established in the online learning lessons, such like bronze, ceramics, pottery, the preservation of the artifacts, Chinese paintings, the restoration of artifacts, Chinese calligraphy study, etc. All online full text lessons can be downloaded for educational uses. The browsers can also watch the online animation. The NPM e-learning community has also been launched and the e-learning, education community, blogs, membership and sitemap are the key contents of the website.

  Website:
  http://npmhost.npm.gov.tw/tts/npmmeta/GC/indexcg.html

- **The Council of Culture Affairs' e-learning**

  Institution/Project: The Council of Culture Affairs.

  Content: In order to provide the learning opportunity and environment of culture and art knowledge, the Council of Cultural Affairs has established its' own e-learning website. The learning topics are as the following: The citizen art and technique, culture industry, community construction, a brief history to the Taiwan technique, the skill of Technique, the Design of technique, and technique and life, and the ideology of technique.

  Website: http://learning.cca.gov.tw/ccalms/

The features of Instructive Information Service are:

(1) Product contains：factual information, reference resources, digital images;
(2) Target users：students and school teachers;
(3) Goals：e-learning or instruction tools.

3.4 Leisure Information Services

The major goal of the NDAP is to preserve the national cultural heritages and the artwork materials which hold the features of Taiwanese local culture. With the benefits from the digital content and web service, we may promote and apply the Taiwan's cultural heritages for leisure use. Therefore, the fourth type of the value-added application of digital archives is the Leisure Information Service. The digital museum and the science educational exhibition websites are the examples of this type. Here are the examples of Leisure Information Services:

- **The National Palace Museum Collection Retrieve System**

  Institution/Project: National Palace Museum.

  Content: The collections of National Palace Museum are already digitized and the retrieve system is already launched to the public. The introduction and the digital image to every collection are provided to the users in order to establish a complete knowledge system of the artifacts. The bronze, jade, ceramic, and rare curios are the major contents of the database.

  Website: http://antiquities.npm.gov.tw/

- **The Digital Museum of Nature and Culture**

  Institution/Project: National Museum of Natural Science.

  Content: The Anthropology, zoology, botany, fungi, alige, and geology. The text introduction, image and resources are provided to showcase the vivacious aspects of collections. The creative learning, online special exhibition and multimedia resources are already launched in the website.

  Website: http://digimuse.nmns.edu.tw/

The features of Leisure Information Services are:

(1) Product contains：multimedia, culture information, digital images;
(2) Target users：the general public;
(3) Goals：leisure, cultural activities.

3.5 Portal Information Services

Another major goal of digital archives is to help the users to access the digital information. Therefore, the institutions' websites hold specific web location and provide all kinds electronic services. With these efforts, these websites become the portal platform of the institute. The fifth type of the value-added information is the Portal Information Service. The official portal website of the institute and the portal websites of the theme of the digital content are the examples of this type.

- **Digital 101**

  Institution/Project: National Museum of Natural Science.

  Content: The vital portal website of the national digital archives program. This website is cooperated by the institutions which are participated in the NDAP. With the online topic exhibition, the collections of museums and other research institutions, such as documents, artifacts and specimen are showcased. Through this effort, the productions of NDAP can offer to the general public for different aspects of application such as life, education, research and industry.

  Website: http://digital101.ndap.org.tw/htm/index.htm

- **Taiwan Culture Portal**

  Institution/Project: Council of Cultural Affairs.

  Content: The Links, Events, News, Stories and Photo galleries are the major content of the Taiwan Culture Portal. The Links provide the basic information of the cultural institutions, educational institutions and artists around Taiwan. Events record the programs, activities and performances of local artists, the abroad Taiwanese artists' activities are also recorded. News offers the latest information of the Taiwan cultural development and is published simultaneously with the Central News Agency. The photo gallery present the Beautiful scenes of Taiwan with elegant images, which describes the modern cultural impression of Taiwan.

  Website: http://www.culture.tw/

Here are the features of Portal Information Services:

(1) Product contains: the integrated information, the digital archives systems and the portal websites' internet services are inclusive;
(2) Target users：NDAP's participant and the general public;
(3) Goals：Web service portal.

4. Conclusion

Since 2002, Taiwan has launched the NDAP and invested a huge amount of resources to ensure the long-term preservation of the important national cultural heritages. The open access of the digital service, and the functions such as retrieve, access, analyze are also vital for the NDAP. With the experience and innovation development for the last years, the value-added application of digital archives is not only to improve the knowledge and economic value application of the digital archives, but also improve the competitiveness in the era of knowledge economy and digital industry.

However, the knowledge repositories such as libraries, museums, and archives, their major goals are to preserve the heritages of this country. It is better to apply the content information and context information for the textual collection such as libraries and archives. Because of the characteristics within its' visual and aesthetic collection, the museums have better performance in the instructive information and leisure information models. As for the portal information service, every institute is providing the best gateway to show the characteristics and integrate other kind of services.

The NDAP of Taiwan combines the professional development of science, humanity and the biology fields. The e-learning is also merged into the digital archives and provides the new application aspect for the digital knowledge. This effort will be a great assistance for Taiwan to promote her international economic competitiveness and help Taiwan steer toward the era of knowledge economy.

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