

Digital Learning Environment: Recent Researches by National History Museum in Taiwan

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National History Museum in Taiwan (1)

- Established in 1955 with the aim of preserving Chinese artifacts and culture.
- More than 55,000 pieces of collections including porcelain, bronze, jade, archive, Chinese painting and calligraphy, woodblock prints, lacquer ware, ivory enamelware and miscellaneous.
- Main activities :
research, exhibition ,
collection, preservation
and education



National History Museum in Taiwan (2)

Visions:

- Enhancing research of historic artifacts
- Enriching to reveal the features of each exhibition
- Enriching the depth and breadth of museum collections
- Providing more educational services
- Promoting international cultural exchanges
- Developing the National Digital Archive Program
- Establishing the museum as a resource center for historic artifacts

Our Strength in Digital Learning Environment

- Precious collections of Chinese artifacts
- Creative ideas for museum learning
- Well-established metadata for the collections
- Strong supported IT technology
 - Multimedia systems
 - Networking applications
 - NDAP(National Digital Archive Program)

Web-based Learning Program for Museum Collections 2000-2002⁽¹⁾

**Program's name : Gorgeousness of Chinese
Artifacts(supported by Ministry of Education)**

- **Three themes:**
 - **Human and the Universe (Bronze and Porcelain)**
 - **Human and Themselves (Contemporary Fine Arts)**
 - **Human and Society (Han and Tang Dynasty)**
- **Enlighten the visitors:**
 - **Creativity**
 - **Complex problem solving**
 - **Critical thinking**
 - **Knowledge integration**

Web-based Learning Program for Museum Collections 2000-2002₍₂₎

- Emphasizing theme -based learning
- Developing thematic museum learning resources on Web

Web-based thematic learning model can promote learner's knowledge integration and cultivate their ability to explore knowledge actively

- Identify a central theme
- Search and identify some topics that related to the subject and the theme-from various content domains
- Integrate contents of each topic to build up structural knowledge ,those contents are related and organized by logical hierarchy

Web-based Learning Program for Museum Collections 2000-2002⁽³⁾

- Organizing the knowledge of historic artifacts based on constructivist's perspectives
 - Curators and educators play as knowledge analyzers
 - Design interactive activity to attract museum visitor to be more interested in historic artifacts
 - Inquired -based learning
 - Organize museum visitors, museum experts ,school teachers and students as a learning community

Web-based Learning Program for Museum Collections 2000-2002⁽⁴⁾

The value of this program:

- **Presenting and receiving information in multimedia format**
- **Evaluating the learning results on line**
- **Publish and share learning outcomes (via CD_ROM and web)**



Web-based Learning Program for Museum Collections 2000-2002⁽⁵⁾

- **Further research:**

- How does technology facilitate museum and school cooperation?

- How technology can be applied in a museum theme-based activity?
 - How a thematic paradise can be successfully created and maintained?
 - How to promote the school teacher have more eager to use the web-learning materials which develop by museum
 - Design different learning models of historic artifacts

National Digital Archive Program of National History Museum⁽¹⁾

(supported by the National Science Council)

- **Goals of NDAP** (Ching –Chun Hsieh : An Introduction to the National Digital Archives Program,in 2002APEC Workshop on e-learning and Digital libraries Proceedings , Dec.16.2002 , pp70)
 - Preserving national cultural collections
 - Popularization fine cultural holdings
 - Strengthening cultural heritage and guiding cultural development
 - Enhancing education and learning
 - Bootstrapping cultural and value-added industries
 - Improving literacy,creativity and quality of life
 - International cooperation and sharing

National Digital Archive Program of National History Museum(2)

- **Framework of NDAP in NMH**
 1. **Using appropriate standards (CDWA- Categories for the Description of Works of Art)to develop digitization metadata system of collections**
 2. **Creating, saving and filing digital images for collections to build up an archives management system**
 3. **Sharing resources with other digitization institutions.**

National Digital Archive Program of National History Museum(3)

- The digitized Chinese Ancient Artifacts collections by National History Museum include Chinese woodblock prints , Chinese painting and calligraphy , Ancient Bronze , Porcelain , Lacquer ware , Bamboo and Wood.



National Digital Archive Program of National History Museum⁽⁴⁾

- **Metadata in digital archive program**

To structure and annotate data which can then be easily reused, transformed, accessed, etc., in order to gain more information and knowledge on demand (ASCC, 2002).

1. Metadata plays a main role in digital archive program
2. Establishing a mechanism to control and manage the digitalized resources
3. Searching digitalized resources



National Digital Archive Program of National History Museum(5)

- Precaution

1. First to identify the characteristics of museum collections

- The attributes and characteristics of variant collections are vary significantly

- Different criteria is required for collections of different categories when developing the metadata.



National Digital Archive Program of National History Museum(6)

2. The goals and directions of the museum will indirectly affects the depth,scope and function of the metadata
3. Museum metadata design will encounter a practical problem is the collection categorization system.
 - Categorization of collections is a process which museum organizes and lists its requirements for the metadata.



National Digital Archive Program of National History Museum⁽⁷⁾

- A discussion on the category structure is basically a discussion of a museum's collection orientation and its related knowledge.
- Different areas of collections required specified category systems and knowledge structures
- Researchers often have very different ways to describe contents of collections, especially in the human and social discipline.

National Digital Archive Program of National History Museum(8)

4. The purpose of establishing a collection system

- Practical and easy use
- Management purpose
- General queries of public users
- Position various artifacts within the knowledge system and interpretation the relationships between them.

National Digital Archive Program of National History Museum⁽⁹⁾

- 5. Management and retrieval should not be in two separate systems**
- Convenient searching and retrieving for outside users**
 - Accurate presentation of the collections to the users**
 - Enable users to gain information from artifacts and relevant research literatures efficiently**

National Digital Archive Program of National History Museum⁽¹⁰⁾

6. Finding ways to closely coordinate metadata with digital archive program

- How to search among the enormous digitalized collections?**
- How to ensure the long-term preservation and availability of the digitalized collections?**
- How to enable the exchange and sharing of digitalized collections?**

National Digital Archive Program of National History Museum⁽¹¹⁾

7. Knowing the attributes of museum information

- Understand the user's demand
- Organizational modes of information
- The standardize and compatible of database

All museums should have a compatible categorization system to enable cross-subject researches, exhibition exchanges inquiries, and data management modernization.



National Digital Archive Program of National History Museum⁽¹²⁾

● Principles

1. Collections held institutions should follow the principles of “sharing” and “universality”.
2. At the initial stage of development, comprehensive and thorough analyses on the contents and descriptions of the collections should be carried out in order to establish a research and collection management system.

National Digital Archive Program of National History Museum(13)

3. At the second stage, common core elements shared by all relevant institutions will then be extracted from these comprehensive and complex analyses.

4. When preceding works done, the system will then be ready to open to the public for enquiries.

National Digital Archive Program of National History Museum⁽¹⁴⁾

● The metadata structure

1. The structure is divided into five categories, according to different users
 - Basic data
 - Management data
 - Research data
 - Preservation data
 - Inquiry data for general users
2. Elements of each category are divided into different qualifiers based on the logical hierarchy of artifacts knowledge.

National Digital Archive Program of National History Museum(15)

- Current achievement

Through this program, we gradually established the museum digital archive system and digital working environment. Moreover, we have generated plenty of digitalized outputs and effective management tools to the maximum use of museum resources .

To Develop the Knowledge Structure of Historic Artifacts (1)

- Introduction

This work aims to establish museum-based digital learning knowledge structure of historic artifacts. There are two main jobs in this program. One is to analyze the elements of historic artifacts knowledge and the other is to study how learners acquire these concepts.

- Concerned ideas

- The important issue of museum digital learning is how to manage and store massive knowledge effectively for exchange and share.

To Develop the Knowledge Structure of Historic Artifacts (2)

- New information is generated/created to help more people access comprehensible historic artifacts knowledge easier.
- Whether the museum knowledge could be shared with people precisely depends upon it is sorted correctly or not.
- Digital learning technology is one of the crucial approaches to share museum-learning resources with the public.

To Develop the Knowledge Structure of Historic Artifacts (3)

- Research Method

1. Metadata analysis for historic artifacts:

This method is expected to accurately and subjectively analyze and organize the knowledge structure of historic artifacts.

2. Analysis learning concept:

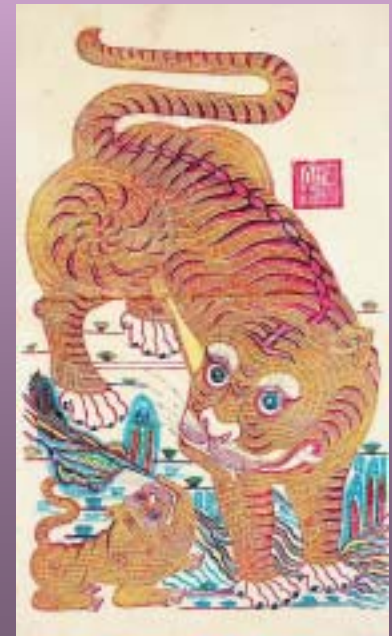
To analyze the learning process of woodblock prints and its related knowledge. This method is used to figure out the knowledge map of learner.

To Develop the Knowledge Structure of Historic Artifacts (4)

- Learning content (To use the results of the NDAP as a base)

1. Chinese woodblock prints

2. Japanese woodblock prints Ukiyo-e



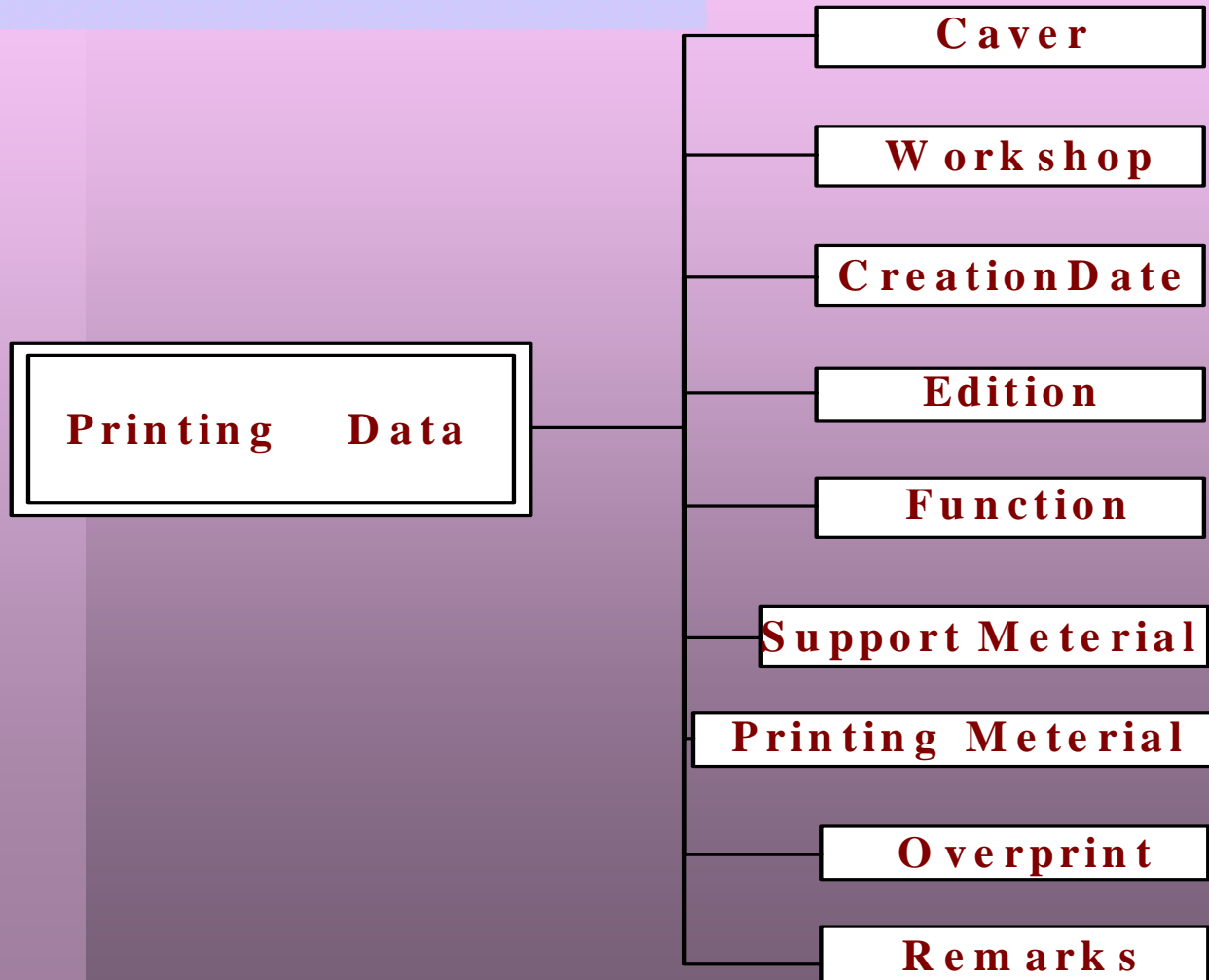
To Develop the Knowledge Structure of Historic Artifacts (5)

- Research Process

1. Analyze and organize the knowledge structure of historic artifacts

- Analyze the elements that constitute the knowledge of woodblock prints and the relationships between elements. (completed)
- Define the definition of knowledge elements of woodblock prints. (completed)
- Establish the related linking functions. (pending)
- Establish the knowledge structure of woodblock prints (completed)

To Develop the Knowledge Structure of Historic Artifacts (6)



To Develop the Knowledge Structure of Historic Artifacts (7)

2. Analyze user's learning process

- Analyze what kind of concepts and abilities the learner will acquire when immersing into a specific knowledge (pending)
- Design the learning hierarchy and process of specific knowledge (pending)
- Design the learning activities: (pending)

The process include description, analysis, explanation ,judgment and multicultural learning

3. Build up the LCMS (pending)

To Develop the Knowledge Structure of Historic Artifacts (8)

- Expected contributions to academic research
 - Provide a research model of digital collection and its application on learning
 - Analysis of museum collection knowledge structure and its application on learning
 - Establish the method of museum learning

Conclusion

As the needs to freely access the knowledge of museum collections are increasing, in the future museums should take more social responsibilities to provide diverse learning materials to publics. This responsibility will drive us to create a digital learning environment for all and to practice the museum's goal of “caring the people” .



*Thank you for your attention
and best wishes to you*

