

# A Case Study of Digital Archive and Value-added Application: The Plant Dyeing, Weaving, and Knitting Arts Digital Learning and Value-added Center

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## Abstract

The age of digital information has arrived with the development of computer science and technology. In Taiwan, the “National Digital Archives Program” (NDAP) has been launched and sponsored for the new era by the National Science Council (NSC) since the year of 2002. It is a national long-term plan with the ultimate mission of preserving and sustaining the culture and civilization of mankind.

In Taiwan, Taichung County has been famous for its traditional weaving and knitting art patterns. One of the major tasks of the Knitting Museum of Taichung County Cultural Center (KMTCCC) is to discover and collect different kinds of braids, weaves, knits, dyes, and embroideries throughout Taiwan. To share these resources and conform to the Value-added Program of the National Science Council (NSC), the purpose of study was to integrate most of the KMTCCC’s archives and collections into a Plant Dyeing and Knitting Art Digital Learning and Value-added Center. This center is a valuable resource for the academic, industrial, and business sectors.

This study used documentary analysis, field study, and questionnaire survey to construct the Plant Dyeing, Weaving, and Knitting Art Digital Learning and Value-added Center. The research began with collecting traditional dyeing, weaving, and knitting artworks and related literary materials to develop digital

contents of the academic sector. Meanwhile, the study conducted many field studies to collect and assemble Taiwan’s plant dyeing, weaving, and knitting database.

The main contribution of this project was to consolidate information sources on knitting art and dyeing materials, and to apply this data for the benefit of the academic, industrial, and business sectors. The results of the Plant Dyeing, Weaving, and Knitting Art Digital Learning and Value-added Center consist of “Dyeing Center,” “Plant Dyeing, Weaving, and Knitting Education Center,” “Dyeing and Design Center,” “On-line Interactive Learning Center,” “Plant Dyeing, Weaving, and Knitting Blog,” “Plant Dyeing, Weaving, and Knitting Resource Database,” “e-Market,” and “Promotion Activities of Plant Dyeing, Weaving, and Knitting Arts and Culture.” The Plant Dyeing, Weaving, and Knitting Art Digital Learning and Value-added Center can be retrieved from: <http://www.ntua.edu.tw/~gca/nsc/plant.html>.

## Introduction

### National Digital Archives Program, Taiwan

The National Digital Archives Program, Taiwan” (NDAP, Taiwan) was launched on January 1st, 2002 and is sponsored by the National Science Council (NSC). The first phase of NDAP is a 5 year program plan for the period 2002 to 2006. It consists of the

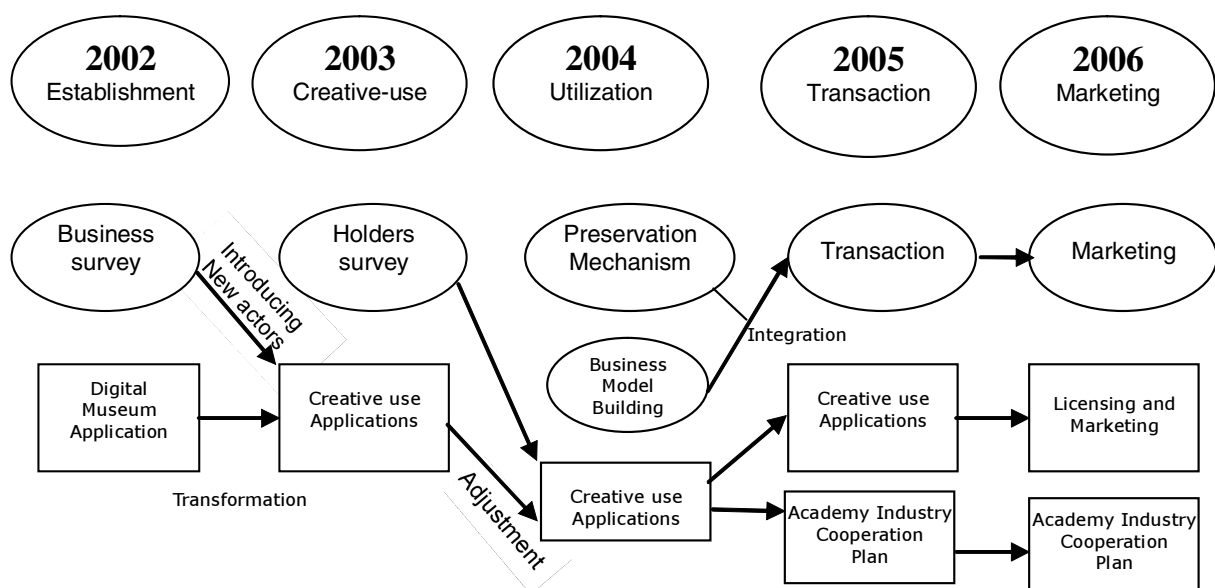


Figure1. Application and Service Division 5-Year Roadmap and Strategic Plans Reference resource: National Digital Archives

Application and Service (APS) and the other four divisions, which are Content Development, Research & Development of Technology, Training & Promotion, and Operations Management. The APS Division has developed a five-year roadmap in order to complete the missions. The tactics are listed under each year. In year 2004, the dynamics was utilization and the focus was creative-use application (See Figure 1). As shown in Figure 1, there are four major missions of the APS Division: 1.) Funding seed projects to build up experience and skills on creative-use; 2.) Laying out marketing strategies to promote digital content industries; 3.) Integrating resources and uses effectively to increase business transactions; 4.) Promoting virtual industrial park to create agglomerated economy.

## Background and purposes

Many different dyes are found naturally in soils, plants, and minerals. For thousands of years, humans have known how to extract and utilize dye from plant stems, leaves, and flowers.

In Taiwan, Taichung County is famous for its traditional weaving and knitting art patterns. One of the major tasks of the Knitting Museum of Taichung County Cultural Center (KMTCCC) is to discover and collect different kinds of braids, weaves, knits, dyes and embroideries throughout Taiwan. By displaying such items, the museum promotes and educates the general public about traditional and modern art practices in hand weaving, knitting, and plant dyeing in the region (Knitting Museum of Taichung County Cultural Center, 2004).

The KMTCCC has collected more than 900 display pieces. Furthermore, the “Knitting Art Museum and Cultural Collections Digital Archives Program” was completed in 2002. In order to share these resources and conform to the Creative Value-added Program of the NSC, all of the archives were integrated into a Plant Dyeing, Weaving, and Knitting Art Digital Learning and Value-added Center. This center has become a valuable resource for the academic, industrial, and business sectors.

The main purpose of this project was to consolidate information sources on weaving art, knitting art and dyeing materials and to apply the information for the benefit of the academic, industrial, and business sectors. The goal of commercialization was to provide a channel to trade in individual products online and to promote related activities. The aim of industrialization was to offer a communication platform for community and related industries to plan how to integrate their resources to improve community development. The ambition of literaturalization was to collect literature and research reports in relation to culture and technique developments of plant dyeing, weaving, and knitting.

## Methodology

This research used documentary analysis, field study and questionnaire survey to construct the Plant Dyeing, Weaving, and Knitting Art Digital Learning and Value-added Center. The study began with collecting traditional dyeing, weaving, and knitting artworks and related literature materials to develop digital contents of the academic sector. Meanwhile, the study conducted many field studies to collect and assemble Taiwan’s plant dyeing, weaving, and knitting database.

The respondents included aboriginal weaving professionals, knitting specialists, plant dyeing artists, and weaving experts, who were on a list provided by the KMTCCC. The structure of this Digital Center is exhibited in Figure 2. By reason of the constraints of budget, time and human resource, a questionnaire survey was used as the supplementary method to assemble the database. 113 questionnaires were sent and 53 of them were returned with a return rate of 46.9 percentage. The questionnaire is consisted of artists’ (1) artwork images, (2) awards, (3) contact information, (4) exhibits of their artworks, (5) publications, (6) special skills, and (7) study background. Conducting field study, this research adopted observations and interviews. The whole process was recorded using video taping to collect information of plant dyeing workshops. The assignment of field study began in July, 2004 and it took four months to complete. Introducing environment of workshops, artists’ artworks, and processes of interviewing were important tasks for compiling information of the section which is the Plant Dyeing, Weaving, and Knitting Resource. The field study surveyed 18 workshops totally. Workshop information demonstrated a workshop category, characteristic, introduction, and location.

## Process

The research used documentary analysis, field study, and questionnaire survey to collect data to construct the Plant Dyeing, Weaving, and Knitting Art Digital Learning and Value-added Center. Moreover, this research and KMTCCC held a four-week exhibition together to popularize plant dyeing, weaving, knitting culture, and Plant Dyeing and Craft Arts Festival. The task descriptions of this project are shown below.

First, the research digitized plant dyeing, weaving, and knitting artworks. Most of plant dyeing, weaving, and knitting archives were digitized by conventional photography method. The process of conventional photography includes: preparing objects, shooting objects, and follow-up. (Hsieh, 2003)

Second, the research collected data by questionnaire survey and field study. The research visited 18 workshops to collect qualitative data by interviewing workshop owners, and video taping the collections and environment of workshops. Due to the budget and time constraints, some of them were surveyed by responding questionnaires instead of having a face-to-face interview. Finally, 53 records about crafting expert information and 54 records about workshops were established. Meanwhile, so as to promoting plant dyeing, weaving, and knitting arts, the research collaborated with the KMTCCC to hold an event, “Plant Dyeing and Craft Arts Festival.” The target population of this event was school children and their parents. The local school children, their parents and teachers showed much appreciation in plant dyeing and craft arts during and after this event. After that, the study established a web site for the Plant Dyeing, Weaving, and Knitting Art Digital Learning and Value-added Center.

Besides database provided by the Taichung County Cultural Center, the study digitized art heritage archives collected during field study, and edited metadata records of artists biography and their artworks via questionnaire surveys. The main purpose was to promote plant dyeing, weaving, and knitting culture by establishing a digital environment in combined with digital archives value-added concepts.

## Results

Based on the purpose of permanent culture heritage preservation and inter-museum resources sharing of National Repository of Cultural Heritage Plan, the research collaborated with Taichung County Cultural Center to establish digital archives for plant dyeing, weaving, and knitting arts. Furthermore, with the aim of sharing these resources and conforming to the National

Digital Archives Value-added Program of the National Science Council, the study integrated most of the KMTCCC's archives and collections into this Plant Dyeing, Weaving, and Knitting Art Digital Learning and Value-added Center to maximize the external application and value-added function. The Digital Center is truly a valuable resource for the academic, industrial, and business sectors.

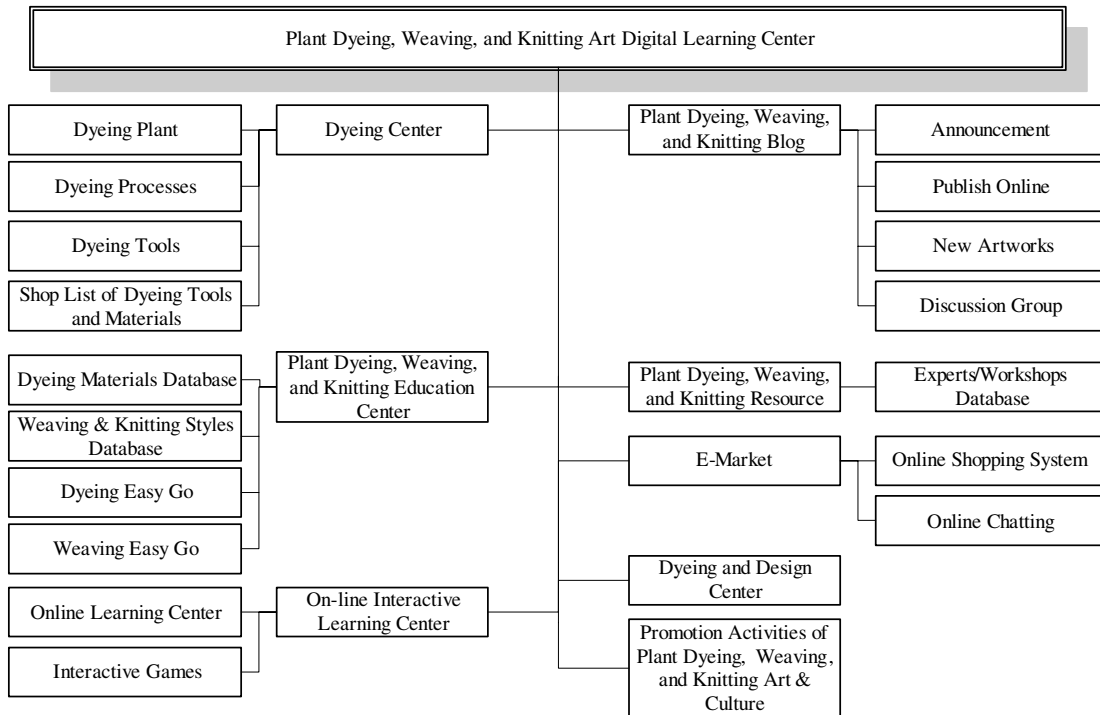


Figure 2. Structure of the Plant Dyeing, Weaving, and Knitting Art Digital Learning Center

### Dyeing Center

This section is composed of knowledge of dyeing plants, dyeing processes, and dyeing instruments. Users can browse the entire dyeing plants at once or search them by seasons. Metadata fields of each dyeing plants include Plant Names, Academic Terms of plants, Living Environment, Location, Plant Introduction, Parts Used for Dyeing, and others. Moreover, it provides a shop list offering dyeing tools and materials.

### Plant Dyeing, Weaving, and Knitting Education Center

This section consists of introduction to dyeing materials, and weaving or knitting styles. Users can search the database by artwork names or artwork classification in Dyeing Materials Database and Weaving & Knitting Styles Database. It also provides on-line videos to demonstrate how to do dyeing, weaving, and knitting.

### Dyeing and Design Center

Users can search dyeing color of plants and their parts by seasons, locations, and altitudes. The results display more than 100 combinations for dyeing color. Metadata of each color include Title of Dyeing Plant, Seasons to Pick, Amount to Be Used, and Resistance of Color Fading.

### On-line Interactive Learning Center

The section provides interactive games and self-learning lectures to educate general public about plant dyeing, weaving, and knitting approaches. Also, this section introduces them plant dyeing, weaving, and knitting workshops.

### Plant Dyeing, Weaving, and Knitting Blog

In this section, interested users can publish articles or submit opinions and questions to communicate with others. Moreover, they can share their artworks with others by uploading digital images of their artworks.

### Plant Dyeing, Weaving, and Knitting Resource Database

This database allows users to search dyeing and weaving experts or workshops by areas. The information includes names of experts, professional specialties, publications, workshops locations, artworks demonstrations, related organizations, and so on. There are 54 records within Plant Dyeing, Weaving, and Knitting Artist Database. In addition, users can retrieve workshop information by locations or names. This research collected workshops information by field study and online information. It also provides a list of

organizations for Plant Dyeing, Weaving, and Knitting Organizations.

### **e-Market**

The e-Market section provides users a possibility to purchase plant dyeing, weaving, and knitting artworks online. In addition, plant dyeing, weaving, and knitting specialists can promote their artworks here. Furthermore, it makes available for interested users online chatting to share information and exchange ideas.

### **Promotion Activities of Plant Dyeing, Weaving, and Knitting Art and Culture**

Several events and activities were held during “Plant Dyeing and Craft Arts Festival” period. All of the promotion activities were recorded and the related news reports for these activities and events were preserved in this section, too

The main contribution of this project is to consolidate information and sources on knitting arts and dyeing materials, and to apply these data for the benefit of the academic, industrial, and business sectors. The Plant Dyeing, Weaving, and Knitting Art Digital Learning and Value-added Center can be retrieved from: <http://www.ntua.edu.tw/~gca/nsc/plant.html>

### **Recommendations**

The purpose of NDAP is not only for culture heritage preservation, but also for digital industry promotion. By the advantage of computer science and technology enhancement, digital application programs are a valid approach to promote Taiwanese culture extensively worldwide. Therefore, it was recommended that program objects should be selected, especially those with Taiwan significance, such as Taiwanese music, Taiwanese opera, or plants/living things only in Taiwan. It is expected that precious heritage should not be conserved, but also advanced.

### **Reference**

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*Dr. Yung-Cheng Hsieh is currently the Professor and Chairperson of Graphic Communication Arts Department of National Taiwan University of Arts (NTUA). Dr. Hsieh earned his Ph. D. degree from Iowa State University in America. He has conducted research in the areas related to graphic communications technology, statistical process control, quality improvement through design of experiments, and technology transfer for the printing industry. Dr. Hsieh was awarded “The Outstanding Professor in Industrial Technology” by National Association of Industrial Technology (NAIT) of America in the year of 2002.*

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