

Cultural, Educational, and Commercial Applications of Digital Archives

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Abstract

In the very beginning of the digital archive programs of museums in Taiwan, the purposes were only for culture preservation, exchange, and sharing. The government then puts more emphases on the cultural, education/learning, commercial applications and services of the digitized content. It would be a waste if we do not make the best use of the digitized content. The digitized content can be and should be used for many other areas such as digital games, digital video applications, digital publications, software applications, internet services, digital learning, mobile applications and services, computer animation, and commercial merchandise such as commodities, and cultural creative products.

The main purpose of this article is to demonstrate how the ACT (Arts, Creativity, Technology) Media Lab in the Department of Graphic Communication Arts at the National Taiwan University of Arts (NTUA) utilized the digital archives licensed from the Museum of World Religions (MWR) to develop cultural, educational, and commercial merchandise in cooperation with two local manufacturer in Taipei, Bright Idea Co., Ltd.. This project was funded by the Council of Culture Affairs (CCA) under a specially granted project named "Creative Value-added Applications of Digital Archiving and Digital Licensing of 2006".

The licensed digital content of this project were a rich and vivid collection of Taiwanese folk religious objects and images, publication, audio, and video archived by the Museum of World Religions (<http://www.mwr.org.tw/library/ch.htm>). Particularly, more than 200 high resolution images of Taiwanese folk cultural artifacts were licensed to develop merchandise in the areas of commodities, creative merchandise, and education/learning/research digital product (e-books). The main roles of the ACT Media Lab in the project were the coordinator of the project, the image and product designer, digital merchandise producer such as animation film and e-books (digital to digital application), and the main marketing strategy and promotion activity planner. The Bright Idea Company was the manufacturer of commodities and creative merchandise (digital to analog application). An official website (<http://gca-server.ntua.edu.tw:9000>) constructed by the ACT Media Lab displays all the information about the project. A database containing the detailed information and metadata related to the digital archives of the Museum of World Religions could be found in the project website. All the merchandises developed by the project can be purchased at the souvenirs store of the Museum of World Religions in Taipei or they can be browsed and purchased online through the e-commerce platform established within the project website.

This government-academy-industry collaboration project has created a new business model and generalized certain amount of profit; the most important of all, the profit has been reimbursed to all the parties participated in this project including the content providers (MWR). The success of this project (model) has been used by the CCA to promote the idea of utilizing licensed digital content to create added value for museums. With the development of digital technology and commercial applications of digital archives, museums have better chances of reaching out to the public and make known to the public. Finally, the success of the project has caused attention from digital content industry and cultural creative industry both in Taiwan and oversea.

Introduction

In recent years, there have been revolutionary changes in digital content distribution and transformational technology. With the government support of digital technologies, Taiwan has been continually testing new techniques and marketing strategies to enhance its competitive edge of digital archiving industry. Since Taiwan has the advantage in the information technology field, the Executive Yuan of Taiwan has developed the "Challenge 2008 National Development Plan" as a proactive means to build the "Digital Taiwan," with emphases on value-added applications and building competitive advantage for the digital content industry and the cultural creative industry. It is one of the most important policy initiatives at the present time. Since 2002, the National Science Council (NSC) and the Council for Culture Affairs (CCA) of the Executive Yuan have developed plans for the innovative enhancement of digital archives and digital licensing. The digital enhancement of important cultural and historical heritages is expected to promote both Taiwan's culture and economy all over the world.

Background and Motivation

In the very beginning of the digital archive programs of museums in Taiwan, the purposes were only for culture preservation, exchange, and sharing. The government then puts more emphases on the cultural, education/learning, commercial applications and services of the digitized content. It would be a waste if we do not make the best use of the digitized content. The digitized content can be and should be used for many other areas such as digital games, digital video applications, digital publications, software applications, internet services, digital learning, mobile applications and services, computer animation, and commercial merchandise such as commodities, and cultural creative products.

Rich Archive of the Museum of World Religions

The Museum of World Religions primarily archives religious objects. Taiwanese folk beliefs comprise one of the archives of the museum. These treasures are rich repositories of stories and traditions. This background, and the unique features of these cultural objects, enabled the Museum to win funding from the Cultural for Cultural Affairs (CCA) National Cultural Information Database for a project entitled the Taiwan Folk Belief Database Program in 2004. Completion of the Taiwan Folk Belief collection digitalization work involved digitalizing 200 artifacts each year (Table 1).

Table 1: Museum of World Religions Council on Cultural Affairs (CCA) Database Artifact Digitalization Statistics

Project Title	Belief: the Quest for Taiwan Folk Belief Digital Archive Value Added Innovation
Content provider	Museum of World Religions
Year Digitalization Begun	2004
Content Categories	Printed Matter, religious statuary, religious scrolls, Buddhist ritual utensils, sacrificial objects, protective talismans
Number of Artifacts	200

Source: Museum of World Religions

Purposes

The main purpose of this article is to demonstrate how the ACT (Arts, Creativity, Technology) Media Lab in the Department of Graphic Communication Arts at the National Taiwan University of Arts (NTUA) utilized the licensed digital archives from the Museum of World Religions (MWR) to develop cultural, educational, and commercial applications and services in cooperation with a local manufacturer in Taipei, Bright Idea Co., Ltd.. This project was funded by the Council of Culture Affairs (CCA) under a specially granted project named “Creative Value-added Applications of Digital Archiving and Digital Licensing of 2006”. The director of ACT Media Lab, Dr. Yung-Cheng Hsieh (the leading author), was the Principal Investigator of the project and formed a research team that consisted of three parties: a digital content providers/licensor (Museum of World Religions), an academy sector (ACT Media Lab at NTUA), and an industrial sector (Bright Idea Co., Ltd.) to complete the very unique assignment.

Research Methodology

From the view point of “system” model, the process of this project was divided into three stages: input, process, and output. In the “input” stage, the research team obtained licensing of the digital content from the content holder, Museum of World Religions, and identified which digital content could be used to develop merchandises. The licensed digital elements included text, high resolution images, audio, and video. In the second stage of “process”, the three sectors of the research team worked closely to determine the types of digital content could be designed for

merchandises to maximize the profit. Once the decisions were being made, the ACT Media Lab, Bright Idea Co., Ltd. would start the creative thinking and designing processes for the merchandises. In this stage, all the designing works were examined, discussed, and revised many times among the three parties till the final design was confirmed and signed by the three parties for each of the merchandise to be manufactured. The final work of this stage was the sample making and mold making based on the confirmed designing. During the final stage of “output”, product manufacturing, marketing and promotion, and merchandise distribution were carried out with the most of assistance from the industrial sector.

The licensed digital content of this project is a rich and vivid collection of Taiwanese folk religious objects and images, publication, audio, and video archived by the Museum of World Religions (<http://www.mwr.org.tw/library/ch.htm>). Particularly, more than 200 high resolution images and two publications of Taiwanese folk cultural artifacts were licensed to develop merchandise in the areas of commodities, creative merchandise, and education/learning/research digital product (e-books). The main roles of the ACT Media Lab in the project were the coordinator of the project, the image and product designer, digital merchandise producer such as animation film and e-books (digital to digital application), and the main marketing strategy and promotion activity planner. The Bright Idea company was the manufacturer of commodities and creative merchandise (digital to analog application). An official website (<http://gca-server.ntua.edu.tw:9000>) constructed by the ACT Media Lab displays all the information about the project. A database containing the detailed information and metadata related to the digital archives of the Museum of World Religions could be found in the project website. All the merchandises developed by the project can be purchased at the souvenirs store of the Museum of World Religions in Taipei or they can be browsed and purchased online through the e-commerce platform established within the project website. People are also able to obtain the information of the merchandises and the artifacts that inspired the designers from the website.

This research was conducted by the Department of Graphic Communication Arts of the National Taiwan University of Arts (NTUA), through the content provider, the Museum of World Religions, and in cooperation with Bright Ideas Design Co, Ltd., the three organizations using the industry-academy cooperation format. In creating the commercial product concepts used in this project, from the start it was recognized that Taiwan Folk beliefs were a unique link in the chain of local cultural tradition. We attempted to turn these precious cultural elements into the design elements of living aesthetics, to bring to the art of Taiwan’s religious culture new innovations and new thinking. Due to this, under these core values and consensus, all three partners played to their strengths. For example, the Museum of World Religions played the role of literature and commercial product consultant, while NTUA offered a research team to carry out the product innovation and design, and plan for marketing and channel promotion strategy, and Bright Ideas Design was responsible for product manufacturing and channel distribution. The process of the project is given in Figure 1.

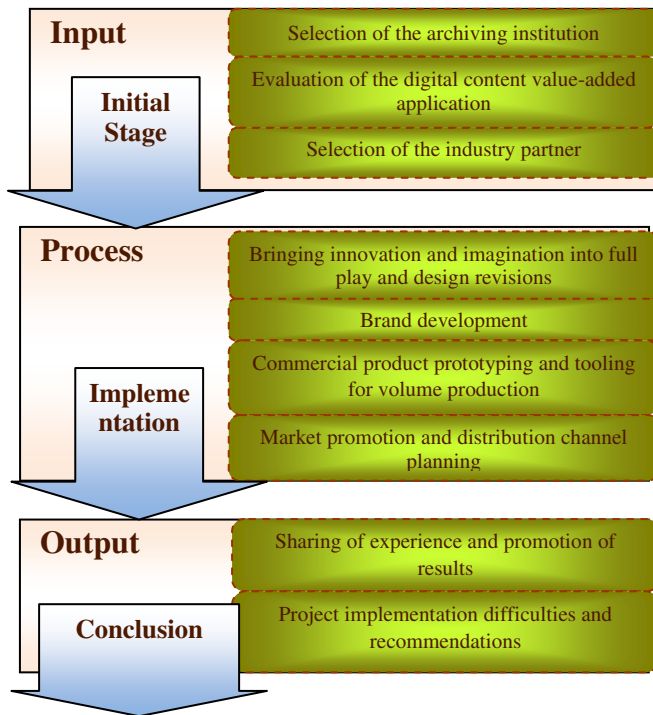


Figure 1. Process of the project

Implementation Procedures

The product planning and developing procedure used in the study was: image design • design revision • prototype development • tooling • volume production • marketing and channel promotion (Figure 2). During each step, regular meetings were held between the academic side (NTUA), the content provider (Museum of World Religions), and industry (Bright Ideas Design) for evaluation and revision before the project could enter the next phase. Only through these steps and principles of quality control could project quality and fulfillment of market demands be assured. The quality control procedures for the development of commercial products in this project are explained below:

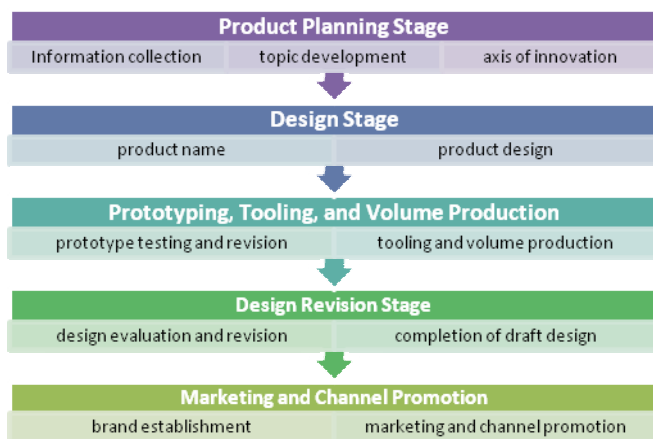


Figure 2. Product planning and developing procedure

Market Analysis and Product Branding and Positioning Stage

The core of a brand lies with consumers, with consumer consciousness and demand concentrated on the market. Digital archive value added application project brand development is currently facing major issues: due to project implementation deadlines, product brand extension is limited. The research team thus argued that the project needed to change the passivity that remained in strategy and competitive strength, and carry out the necessary brand establishment through enhancement of product core competitiveness. In order to build a correct product strategy and brand establishment, the research team carried out market analysis work. We realized that in today's Taiwan, temple culture value added commercial products such as souvenirs and gift articles lack innovative design, some simply directly using religious images, resulting in stern, dull products. In light of this, the research team suggested four major commercial product development axes: branded molds, relevant topical internet websites, and cute depictions of gods and Buddhas as commercial entertainment products aimed at the youth market.

Selection of the Image

In selecting a digital image of an artifact from the collection of the Museum of World Religions, the project was given the legal rights to 200 images. Digital content materials use was determined by a number of meetings between the NTUA research team and Bright Ideas Design, in which each object's unique features and narrative potential were evaluated. In this way the direction of cultural objects for use in commercial product design was decided.

Design

- Commercial Product Determination**
Choosing and then developing a commercial product must begin with consideration of the market trends, materials, and exhibition results. After regular meetings every one-two weeks between the NTUA research team, Bright Ideas Design, and the Museum, based on its professional judgment, the team decided on two commercial products series, Museum Educational Products, and Innovation Commercial Products. These became the foundation of the project's designs.
- Soliciting ideas for a Draft and Deciding on a Draft**
In order to broaden innovation and foster new elegance in designs, the NTUA research team and Bright Ideas Design together entered into a phased program of work. First, exceptional students from NTUA were invited to give input into the design. The students, the research team, and Bright Ideas Design held regular product design meetings every 1-2 weeks. During these meetings, the host brought up design images and design concepts. After numerous critiques and revisions, the planning host and Bright Ideas Design decided on designs that were innovative, market-oriented, and feasible. Together the draft designs were determined, and the process moved to the next stage of prototype testing.
- Prototype testing, Tooling, and Volume Production**
Once the design was determined, the image was put through a 3D animation image design system, and a prototype was made at the production facility. Items for evaluation of the prototype include textures and color, and whether the product

and its packaging materials obeyed the relevant environmental and safety laws. In accordance with the quality control standards and procedures established by the project, if any of the above items failed to meet the requirements of the project planning host, the production facility manufactured another prototype from scratch, and the project host carried out another round of evaluations, in order to ensure that the product was ready for volume production.

Market Promotion and Channel Distribution Plan

The NTUA research team, the Museum, and Bright Ideas Design held numerous meetings to discuss the appearance of the prototype and other aspects of the development process. These set the stage for volume production of the commercial product. To broaden the economic benefits of the commercial product, ideas were collected from the NTUA research team, the Museum, and Bright Ideas Design, and the three organizations jointly planned a strategy for promotional activities. This strategy included: activity planning, public relations, and media publicity. The goal of the activity planning was to widely promote the results of the digital archive value added application development. To broaden the benefits of promotion, public relations and publicity to enhance the benefits of the project results was a key promotional objective. Thus, the project’s media relations strategy was divided into four components: print media, television media, electronic media, and broadcast media. Print media primarily meant newspapers and magazines that report news; in the case of television media both cable and conventional broadcast television news were targeted; while for electronic media, famous news websites both in Taiwan and abroad were the objectives. Through these activities of value added promotion and media reporting, it was expected that cultural promotion and product marketing would be accomplished. When local citizens participate in the project, they could indirectly come to understand role of digital archives in elevating and enriching traditional culture promotion.

Results

The objectives of this research were to use interesting products to revive the memories of Taiwan’s Folk Beliefs among the local populace, in conjunction with the collection of the Museum of World Religions. Designs were not limited to local gods, but embraced the whole of the island’s folk religions, including Buddhist ritual utensils, protective talismans, and sacrificial objects. The packaging of each item contained explanations of the artifact and an original image. This enabled the authentic culture of Taiwan folk beliefs to be passed on in a commercial product. Further, by developing a powerful brand, placing each product under it, and leveraging the brand for promotion, the popularity of Taiwan Folk Beliefs and their associated products will be greatly enhanced. The results of the value added products developed in this project (Tables 2 and 3) include the Museum’s Educational items for Children, and Innovative Products designed with cultural and living considerations in mind.

Brand Structure

Taiwan folk beliefs are one link in the long chain of Taiwan traditional folk culture. Through the efforts of the digital archive

value added applications program of the Museum of World Religions and Bright Ideas Design, cultural elements from the Museum collection are turned into living aesthetic design elements, creating new innovation and new thinking for Taiwan’s religious art. Design of the “It’s Good to Pray” brand concept led to design of a series of visually distinct systems (Figure 3) that in turn became the promotional topics and brands for the commercial products.



Figure 3. “It’s Good to Pray” logo





Product Planning

Project products were divided into two categories: Children’s Educational items for the Museum, and Innovative Products incorporating cultural and living considerations. Their products and concepts are discussed below.

Museum Children’s Educational items – DIY Commercial Product Series

Using illustrations and images commonly seen in folk beliefs, the gods Cai Shen and the three immortals Fu Lu Shou, we designed Cai Shen foam prints and Fu Lu Shou patches for a DIY learning package (Table 2). We also designed foam stickers to replace the normal kind, which require carving, not only to increase child safety during use, but also to provide cultural and aesthetic educational items.





Table 2: The Museum’s Children’s Educational Items – DIY Commercial Product Series









Product	Product Concepts	Museum Artifact	Design Imagery
Cai Shen Foam Prints	Using the foam as a creative material, making lucky articles to wish others good fortune, and to reflect on the artwork. Simple, safe DIY materials were used in its preparation.		
Fu Lu Shou Foam Puzzles and Patches	The Three Immortals are turned into bats, deer, and peaches. Lucky words are turned into patches and puzzles. May be washed and used repeatedly, for unlimited creative play.		

Innovative Products Series

This series of commercial products targets the younger generation, bring the Museum’s artifacts into life in an entrepreneurial manner. Combining images of statues of gods and Buddhas, Buddhist religious utensils, and sacrificial objects from the Museum archives with innovative design, emphasizing prayer and seeking thoughts of peace, six innovative products were created (Table 3).

Table 3: Innovative Products Series

Product	Product Concepts	Museum Artifact	Design Imagery
God of Luck 3D postcard series	Modern individuals need someone to care for them in both heart and soul. This product breaks through the pattern established by our forbearers of going to the temple in order to pray for a better life. Nowadays, if a blessing from the god is needed, merely bring him home. This product emphasizes the energy of good fortune. 8 attractive types of god-related items shorten the distance between believers and their gods.		
Wolf-toothed Mace family of mobile phone charms	Hoping to overthrow the common perception that the wolf-toothed mace brings only the shedding of blood, we have refashioned into an anthropomorphic toy. A family of three irresistibly cute mobile phone charms was designed inspired by the wolf-toothed mace used by believers possessed by a god. These can be used for massage, entertainment, or convenience. Give them a role – they have many stories to tell.		

Product	Product Concepts	Museum Artifact	Design Imagery
Mobile Divination Blocks	When humans encounter puzzles or confusion, they need guidance. These divination blocks, small in size and cool in design, can be slipped into any pocket. No matter where the user is, or whether he has a coin, these mobile divination blocks can be used to resolve the issue.		
Stone Lion Tilting Doll Series	Stone Lions commonly protect the gates of temples. We have turned this image into a kind of stationary item for use on a desk, still fulfilling their role of protection. The head can hold business cards while the stomach has a space for paper clips and other small objects. It will rock back and forth, and release the day’s tensions.		
Fu Lu Shou Business Card Case	This business card case was created to target businessmen and office workers. The design concept sought to lose the blessings and power of the Three Immortals to bring customers luck, promotional benefits, and healthy energy.		
Imaginary Lucky Beast Doll	This playful name, a pun on the Fu Lu Shou (Three Immortals) above, combines the unique features of animals’ representative of long life, including bat, deer, and crane, in an attractive and interesting shape.		

Promotion and Channel Marketing Strategy

After discussions between the NTUA research team, the Museum, and Bright Ideas Design, based on the professional judgment of Bright Ideas Design, the channel marketing plan outlined below was proposed.

Special Channels: Innovative Products Moving into Temple Souvenir Stands

The culture of ordinary people is closely related to the activities of the temple. Using religious images as design elements, innovative products are planned for temple souvenir stands around Taiwan. For example, this year's Matsu procession design features playful prints of Matsu images. Bringing religion to young people, it can help create a new style, and act as a market stimulus for the products developed in this project. Currently the world of Taiwan's temples generally lacks unique and high quality innovative products, yet annual temple activities attract throngs of people all over the island. Where crowds bustle money will flow, a great business opportunity is well worth developing. Even more importantly, many temples are historical sites rich in cultural atmosphere.

Virtual Channels: Project Operated Commercial Platform and Member Recruitment

Internet transactions have become a major marketing trend, and the project developed a commercial transactions platform for the internet that used project resources to establish an online shop. This was considered the best market channel. The internet enabled the project to contact members of the Museum of World Religions, while at the same time seminars and talks were used to expand the membership base. Member recruiting and social network marketing were used to perform online marketing. Thus, the most economical marketing budget produced the greatest benefit.

Business Gift Boxes: Life Insurance Agents Business Gifts

This strategy used the habit of business channel agents to give gift boxes on the appropriate holidays, especially insurance agents and banking salesmen. For example, at Chinese New Year's gifts are required to service customer relationships. Promoting gift boxes with a Taiwan flavor is a perfect match for the marketing activities designed for the holiday.

Chain Store Channels: Museums, Bookstores, Tourist Sites

Brick and mortar channels typically use an agent working on commission to make sales. Traditional brick and mortar channels in this project included museums, bookstore chains, and shops at tourist sites. Using exhibit design as the focal point of the marketing effort, coupled with digital learning products and innovative products, a professionally designed exhibit was created, and effective marketing accomplished. For example, this strategy is especially able to reach promotional goals when sales accompany an exhibition of the Museum of World Religions.

Activities and Exhibition Sales: Accompanying Religious Activities

Cultural value added concept promotions are common in folk culture. Sales of commercial products in concert with educational and cultural activities can drive short term sales explosions. At present the plan for participation in exhibitions includes domestic exhibitions such as the spring and fall Gift and Souvenir

Exhibitions of Taiwan, the Taiwan International Creative Industries Exhibition, and the International Crafts Exhibition, and other international events such as the Licensing International Expo.

Conclusions and Recommendations

The main results of the project include:

1. A new branding of creative cultural merchandise called "It's Good to Pray" consist 8 different kinds of creative products. (Cultural/Commercial applications)
2. A 2D/3D animation film which won the first place title of "the 2007 Commercial Applications Contest of Digital Archives" held by the National Science Council. (Cultural/Educational/Learning/Commercial applications)
3. Four multimedia e-books (Pursuing Good Fortune-Taiwan Folk Cultural Artifacts, Life Etiquette, Exorcism & Blessing Recruitment, Lunar Month & Solar Terms) that introduce Taiwan folk beliefs. (Cultural/Educational/Learning application)
4. An official website that introduces the digital archives of MWR and the merchandises and applications mentioned above. (Cultural/Educational/Learning application)
5. A group of young and talented designers were discovered by holding a "2007 Design Talent Contest of Using Licensed Images to Design Creative Cultural Products". (Cultural/Promotion application)
6. A product and digital content licensing exhibition of the project held on September 28-30, 2007 at Huashan Culture Park in Taipei has drawn much attention from the traditional manufacturing industry and cultural creative industry. (Commercial/Promotion application). Up-to-date, there are at least 15 companies interested in joining such a project after visiting the exhibition.

Below we offer several findings as a reference for future digital archive value added applications projects:

Quality of collection digitalization and its derivative value

The digital images in digital archives are produced primarily through scanning and photography. Because of this, from the perspective of digital content development program tasks or projects, digital imagery has two major goals: preservation of the artifact's appearance and an information record about the artifact (Hsieh, 2006). Preservation of the appearance of the artifact is carried out by providing a record of the artifact's shape and color. A superior quality digital image is thus able to produce derivative aesthetic value. In preservation of information about the artifact, the most importance objective is to clearly record the object's unique information, such as any writing, images, or patterns that may be found on it. Effective attainment of this objective in recording artifact information in digital imaging is capable of creating academic research and value added applications value.

Selection of the Cooperating Firm

Given the discussion above, good digital value added innovation results are closely related to the quality of the digital materials. Enhancing the quality of the digital materials used and the nature of the cooperating industry firm are tightly intertwined. As a consequence, when a cooperating firm was being sought for

this project, in addition to the priority placed on seeking a high quality company, whether the cooperating firm possessed experience in digital value added applications was important. The cooperative partner in this project, Bright Ideas Design, was founded in 1999. It excels in new, unique, and lively technology and language designs using multimedia, animation, and gaming entertainment technology to reconfigure cultural content. Beginning in 2002, during the promotion of the digital content research, Bright Ideas Design began energetic participation in digital content contests, and both at home and abroad did very well. In 2003 it expanded its innovation of value added commercial products. At the Lourve and at special exhibitions, it held exhibitions of a series of topical commercial products. As a result, the research team was aware that the strength of Bright Ideas Design had a strong reputation in the digital content industry.

This government-academy-industry collaboration project has created a new business model and generalized certain amount of profit; the most important of all, the profit has been reimbursed to all the parties participated in this project including the content providers (MWR). The success of this project (model) has been used by the CCA to promote the idea of utilizing licensed digital content to create added value for museums. With the development of digital technology and commercial applications of digital archives, museums have better chances of reaching out to the public and make known to the public. Finally, the success of the project has caused attention from digital content industry and cultural creative industry both in Taiwan and oversea. A total of 15 local companies in Taiwan and several online game companies in Korea have made contact with the authors for further cooperation.

Intellectual Property (IP) Issues: Be certain of the intellectual property rights for artifacts from the collection

In the digital archive value added applications process, it is common to encounter legal issues. For example, primitive archivists need to clarify who controls the IP or materials rights, creating difficulties for each department carrying out the program. At the same time, industry's hands are tied by the lack of clear IP rights. Due to this, to control the sources of artifacts and associated legal issues, a strict intellectual property process and relevant signed legal agreements are absolutely necessary. By the same token, archives and cooperating businesses must reach a consensus, so that subsequent processes can proceed smoothly under the law. This digital value added program followed these principles and processes. Cooperating enterprises and archive departments signed intellectual property agreements. In the agreements it was necessary to clearly explain the range of categories of use for the images, restrictions, and standards. With this, both sides can follow the conditions that are clearly spelled out in the IP agreements in performing each task, not only enhancing the efficiency of the project execution, but also enabling both sides to reach a consensus on cooperation, and to grasp the image quality necessary to the creation of value added commercial products.

During the digital content process, IP issues were frequently an important difficulty for business, needing to be crystal clear. Such issues included clarifying the usage rights of the digital archivists, product usage rights issues, and IP issues between the content provider and the business partner. To resolve these issues,

during the IP review stage for artifacts from the collection, the project conducted a stringent IP review process and relevant agreements controlling the artifacts origin and legality were signed, enabling the most effective exploitation of the digital content for value added applications. Product IP ownership issues and feedback mechanisms, due to current gaps in the relevant legal framework, there is often nothing for value added applications and projects to follow. The researchers suggest that the relevant government agencies should accelerate their efforts on digital content laws and regulations, in order to encourage creativity in, and exploitation of, digital content in both industry and society at large.

Clarify Authority and Responsibility in the Work Process

This project is an example of industry-academic cooperation. To assure that the commercial products of the project's value added applications have the highest quality and value, the Museum played the role of literature provider and product consultant, the NTUA research team and Bright Ideas Design were responsible for product innovation and design, and for planning the market and channel promotion strategies. In any plan or project implementation, clear authority enables each unit to focus on its area of responsibility. Through clarification of the project workflow, not only will each participant be clearly aware of tasks and their content, establishment of a standardized production process will maintain the quality of the project results.

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Author Biography

Dr. Yung-cheng Hsieh is currently the Professor and Chairperson of the Department of Graphic Communication Arts at National Taiwan University of Arts (NTUA). Dr. Hsieh earned his Ph.D. degree from Iowa State University. He has conducted researches in the areas related to graphic communications technology and digital archives. Dr. Hsieh was awarded "The Outstanding Professor in Industrial Technology" by National Association of Industrial Technology (NAIT) of the United States in the year of 2002, and received "The Research Excellence Award" of NTUA in the year of 2003 and 2006. He has published more than 60 peer-reviewed journal articles and more than 50 conference paper since 1998. He is also the primary author of three books in the area of graphic communications and digital content. In addition, Dr. Hsieh established the ACT Media Lab at NTUA in 2006.

Hui-wen (Griet) Cheng is currently a research assistant and graduate student in the Department of Graphic Communication Arts at the National Taiwan University of Arts (NTUA). Miss. Cheng has worked with Dr. Yung-Cheng Hsieh in the areas of printing technology and digital archives. She has worked with Dr. Hsieh in more than 14 research projects funded

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Chao-chen Chen is professor and the chairperson of the Graduate Institute of Library and Information Studies, National Taiwan Normal University. She received the Ph.D. degree in Department of Library and Information Science from National Taiwan University in December 1994, and M.A. degree from the same university. Currently, she is the President of Library Association of the Republic of China. Dr. Chen has conducted many research projects and is interested in several research areas, including digital libraries, library automation, information organization and metadata, multimedia, e-publishing, e-learning.