

National Palace Museum and service innovations

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This case study is published in partnership with the Asian Society of Management and Marketing Research (ASMMR) as part of the 2014 ASMMR - Emerald EEMCS Teaching Case Competition.

The authors gratefully acknowledge financial support from the National Science Council, Taiwan, R. O. C. (Project No. NSC 101-2420-H-004-005-MY3 and NSC 102-2420-H-004-006-MY2).

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In 2006, the NPM in Taipei, Taiwan, issued an advertising image titled “*Old is New*” based on “*A Letter on Floral Fragrances*” by the Song Dynasty calligrapher Tingjian Huang. In 2010, the NPM announced its new vision called “*Reviving the Charm of an Ancient Collection and Creating New values for Generations to Come*” (Annual Report 2010, 2010). Furthermore, in recent years, the NPM has been shifting its operational focus from being object-oriented to being public-centered, and the museum holdings of the NPM have not only the physical forms of its artifacts and documents but also its collection of digital images and metadata. The shifts of vision and operational focus have been designed to change the NPM’s image from that of being a traditional antiques silo into one of an active participant in social education. These shifts have been undertaken to inject new life into its collection of historical artifacts. Archived collections would be given a refreshingly new image, be pushed out to people for viewing online, and become more connected with people’s daily lives.

In this vein, to form the foundations for the aforementioned shifts, the NPM has begun to conduct its National Digital Archives Program[1] sponsored by Taiwan’s National Science Council (which became the Ministry of Science and Technology on February 3, 2014). Moreover, the NPM has collaborated extensively with both local and foreign designers to transform the historical spirit, cultural meaning and formal esthetics of the Chinese cultural relics into contemporary cultural and creative products. Through such derivative cultural and creative products, it is intended that the NPM experience can be extended after visiting the museum and that the significance of Chinese culture and art can be transplanted into the daily lives of museum visitors.

Among these endeavors for infusing life into ancient artifacts and texts, sustaining the curiosity of the public for Chinese culture and history, and invoking their desire to visit the NPM in person, the key media are digital technology applications and service innovations. The service innovations can be grouped into two further categories: the ones enabled by ICT- and the non-ICT-enabled ones. These endeavors are a clear argument that adopting digital technologies and innovative services can impact the museum positively.

However, change has been accompanied by many challenges and contrary opinions about the project from the public, the government and from academia. The NPM administration wants to keep Chinese culture relevant in the modern age. However, to plan for the future while reviewing the past, the NPM administration has had to consider its next steps with care.

Reviving Chinese cultural and historical artifacts

The NPM has been lauded as one of the top five museums in the world and is famous for its most extensive and intricate collection of artifacts derived from the Chinese civilization.

The museum collection now stands at over 700,000 items, making it one of the most popular destinations in Taiwan for international tourists (National Palace Museum, 2013b).

The administration of the NPM is currently under the Executive Yuan in Taiwan and is the most prestigious museum in Taiwan in terms of its administrative ranking. According to its Organization Act[2], the museum administration is led by a director who is also a cabinet member of the Executive Yuan. The director and two deputy directors and a secretary general are required to report to the Legislative Yuan in Taiwan on a regular basis. As shown in Figure 1, the NPM is organized into seven departments (Department of Antiques, Department of Painting and Calligraphy, Department of Rare Books and Historical Documents, Department of Registration and Conservation, Department of Education, Exhibition and Information Service, Department of Cultural Creativity and Marketing and Department of the Southern Branch) and five offices (Secretariat and General Affairs Office, Human Resources Office, Accounting Office, Security Management Office and Civil Service Ethics Office). Museum funding is derived mostly from the allowance provided by the central government.

To go beyond its traditional functions and get closer to the general public, the NPM must incorporate popular elements and technologies to add creativity to its services. That is, the modernized NPM is gradually transforming its traditional and stereotyped image into a revitalized and creative one that is able to get in touch with people's daily lives (Merit Times, 2013a). To cope with this modernizing trend, the NPM had implemented two organizational restructurings to enhance these changes (Yeh, 2008). Figures 2 and 3 show the organization charts of former days. For example, the Department of Education, Exhibition and Information Service has integrated the three major functions of education and awareness programs, exhibit services and information technology. Additionally, the NPM has strengthened its marketing techniques to improve its competitiveness. Another issue that is worthy of mention is the dedicated commitment made by the NPM to the digitalization of its collections and further utilization of digitalized sources has been made in response to government policies (National Palace Museum, 2013c). Funded by

Figure 1 The organization chart of the NPM in Taipei (from January 1, 2012 to the present)

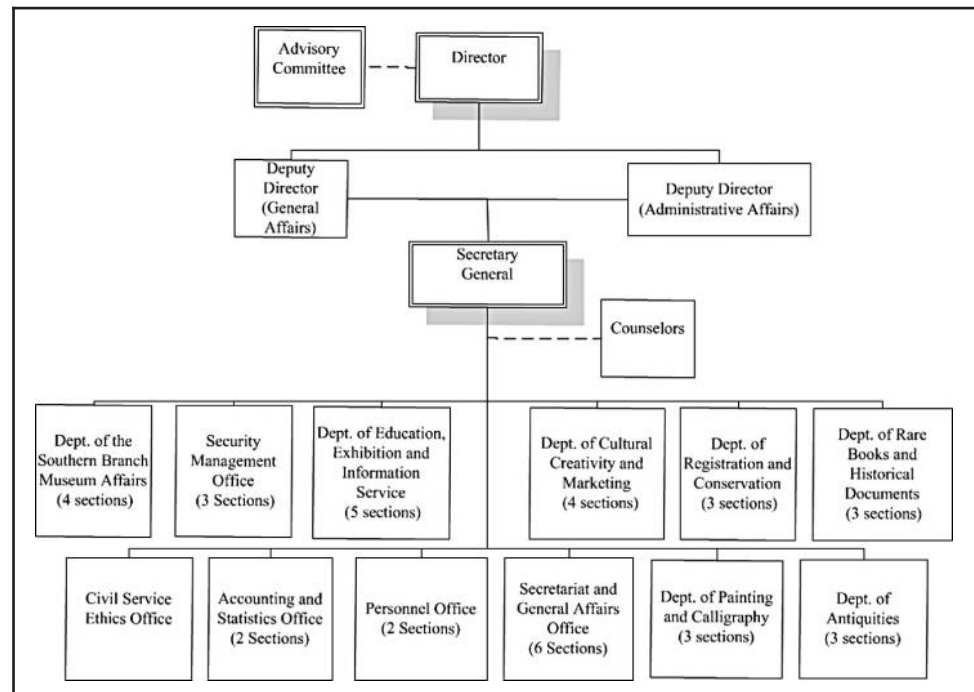
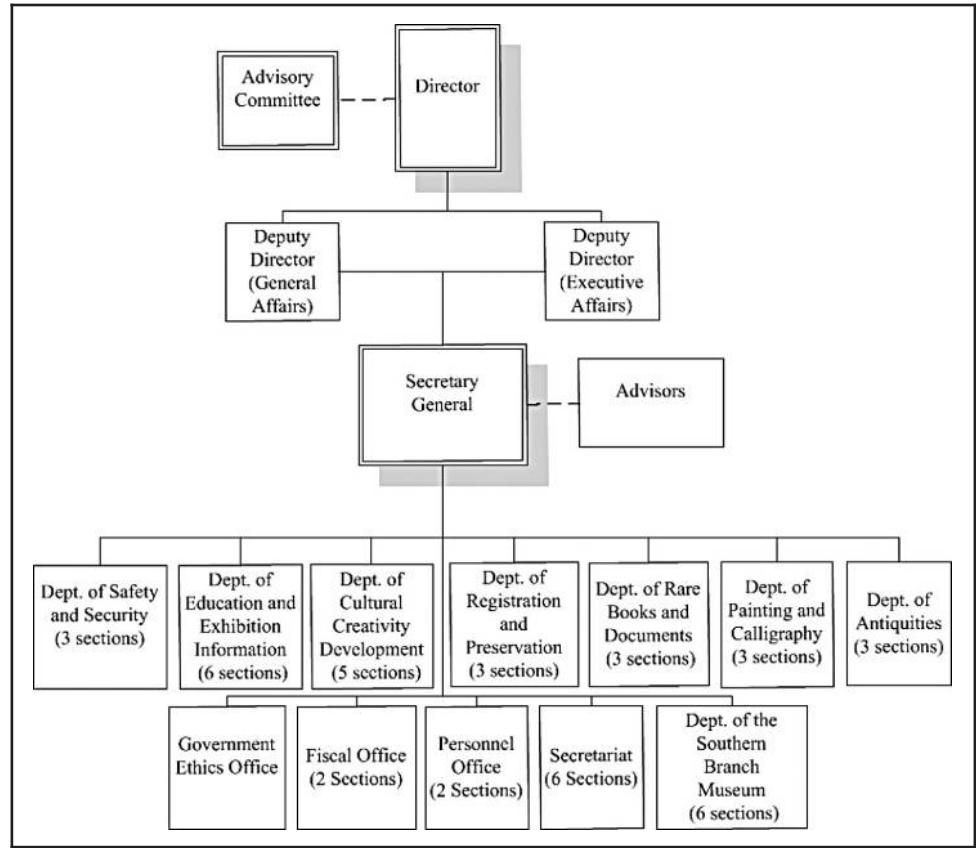


Figure 2 The organization chart of the NPM in Taipei (from November 2, 2009 to December 31, 2011)



the government and with public support and resources, spectacular results have been achieved after implementing the decade-long National Digital Archives Program and the Cultural and Creative Project[3]. These results may be divided into two categories: ICT-enabled services innovations and non-ICT-enabled services innovations.

ICT-enabled services innovations

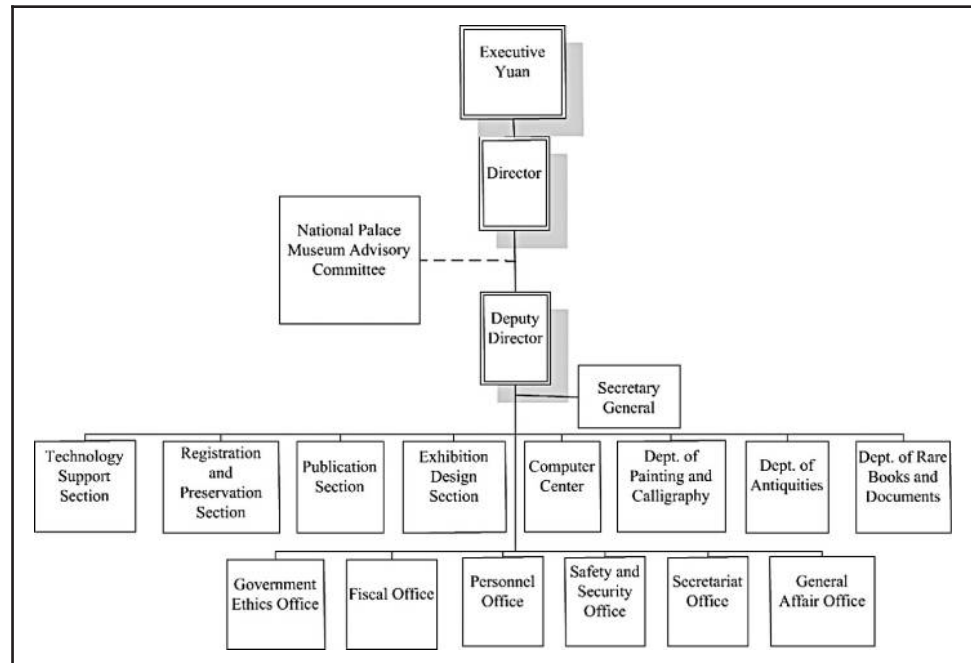
ICT-enabled services mean those online, instantaneous and interactive services supported by ICT. ICT-enabled services emphasize:

- IT empowerment for external customers, giving them a novel and independent role as active participants within the self-directed service system; and
- incorporation of ICT for middle- and back-office processes within or between organizations to streamline overall services.

ICT-enabled services can improve customization, accuracy, ease-of-use, control and service-related satisfaction ratings. In general, the characteristics of ICT-enabled services include a rich source of information that is intelligent, automated and self-directed (Huang *et al.*, 2013).

With this in mind, the prerequisite necessary for the establishment of ICT-enabled services in the NPM would be the strengthening of its existing digital infrastructure. As part of its participation in the National Digital Archives Program, the NPM adopts pioneering high-tech methods such as digital photography and three-dimensional (3-D) modeling to manage its collection, allowing the museum to retain the physical integrity and value of its

Figure 3 The organization chart of the NPM in Taipei (from 1986 to 2008)



collection indefinitely in the digital era. The NPM digital archives can be divided into seven categories[4] listed as follows:

1. *Web site and various theme-based Web pages*: Images and metadata created for the Digital Archives provide the best source for materials needed to create the Web site and other theme-based Webpages.
2. *Multimedia interactive CD-ROM*: CD-ROMs provide the general public with an interactive means of understanding national treasures.
3. *NPM e-newsletter*: The proactive and instantaneous nature of the e-newsletter could be used to provide information about ongoing exhibits and the newest events held by the NPM.
4. *NPM movies*: Movies can be used as a novel means of introducing historical treasures and reviving ancient artifacts.
5. *Image advertisements*: Different presentation methods can be used to expand imaginative opportunities and help people living in the modern era become connected with historical artifacts.
6. *Commercial value-adding*: Resources generated for the Digital Archives can be used to create various marketable items, such as picture albums, hanging ornaments and souvenirs.
7. *Digital learning*: Various tools such as learning equipment, online learning and interactive games provided in the exhibits would help people gain a more comprehensive understanding of the artifacts. For example, the *Royal Garden of Emperor Huizong of Song* would be the first exhibit to make extensive use of interactive multimedia to present historical artifacts. The unique aspect of this exhibit is that no physical artifacts were actually presented. Visitors would be able to examine the intricate details of the artworks and items through digital images shown on a computer display. Visitors could use new and unique forms of interactive media, such as an animated picture scroll of the same scale with the original artwork. Detailed contextual background introductions would be provided as users wield a fan to browse through

the *Children Playing*, *Literary Gathering* and *Cat and Peonies*. Users may also unfurl a scroll to admire the calligraphy of Emperor Huizong's *Couplet*, Su Tung-po's *Cold Food Observance* and Liu Sung-nien's *Elegant Gathering at the Western Garden*. Interactive devices allow visitors to answer questions posted directly on the virtual artworks. The use of interactive learning and gaming within a digital art exhibit helps visitors attain a deeper understanding of Song dynasty artworks and artifacts ([China Times/Taitung News/C2 Cheng Chieh-cheng/Taitung, 2005](#)).

To sum up, the overall digitalization of the NPM's collections can be divided into three conceptual levels. The most fundamental level is to create digital content and digital databases of the extensive museum collection. The next level is to utilize the generated digital materials for marketing purposes or digital exhibits. The final level ([National Palace Museum, 2002](#)) is to utilize the extensive results generated by the previous two levels to support educational effectiveness, improve awareness for our historical artifacts and boost the cultural sophistication of the general public using the power of technology. Results of the digitalization could be authorized for public use to create novel products in addition to retaining the values of the artifacts ([Commercial Times/Technology/Panel 10 Ying-wei Ho/Taipei, 2005](#)).

For example, to achieve better interaction and generate interest among younger generations, two apps[5] titled *NPM on the go* and *Standing Exhibits of the NPM* have been developed to create a dynamic cultural exhibit. Users can blow across their iPad[6] to reveal Duke Mao's Cauldron and its inscriptions from underneath a virtual layer of dust. Users can also softly swipe Huaisu's *Autobiography* to transform the original cursive script (that most modern readers may have difficulty reading) into regular script. *NPM on the go* achieved over 11,000 downloads in the first six months of its release. The most popular element of the app would be the interactive exhibits of 100 national treasures and twenty virtual artifacts. The *Standing Exhibits of the NPM* includes a selection of nearly 400 artifacts. The app allows readers to browse the collection with Chinese, English and Japanese language commentaries. Quick response (QR) codes[7] with tour guiding functions are also provided for the displayed artifacts so that visitors can quickly find national artifacts that they wish to visit ([Merit Times, 2013b](#)).

In 2011, the much anticipated *Landscape Reunited – Huang Gongwang and Dwelling in the Fuchun Mountains* exhibit in both China and Taiwan was hosted by the NPM. The historically significant reunion of the two sections *The Remaining Mountain* and *The Wuyong Version* was achieved for the first time in 360 years. To expose the young generation to the painting and calligraphic works of ancient Chinese literati, the NPM also launched the *Landscape Reunited – A New Multimedia Gallery of Huang Gongwang's Dwelling in the Fuchun Mountains*. The museum invited new media artist Lin Jun-ting[8] to create a 3-D animation called *Dwelling in the Fuchun Mountains*. Fifty projectors were provided by Delta Electronics Inc. to display the entire work which measured 180 cm in length. The overlapping digital projections generated animated and lifelike motions within the landscape painting. Visitors were able to interact with the exhibit through different movements and behaviors. For example, clapping and shouting made the characters within the *Dwelling in the Fuchun Mountains* turn their heads around, wave their fans or cast their lines to begin fishing. Visitors could make the water in the painting ripple or shimmer by waving their hands. Indeed, technology has been used to revive this ancient artwork by allowing an interactive and dreamlike experience of journeying through the world depicted within. New media art has created a new esthetic experience of art appreciation and interaction. It is hoped that these novel means of art appreciation and modern digital visual experiences will help to generate new connections with the artwork and create inspiring memories of cultural experiences and classical works ([Chen, 2013](#)).

In 2012, the NPM joined with Google to announce the *Art Project* Webpage section on collections from the NPM. The collaborative *Art Project* with Google allowed the NPM to display its collections and exhibits publicly via an online platform, allowing it to overcome

temporal and spatial boundaries between the museum and the rest of the world (NPM/ Press Section, 2012). The NPM selected 18 popular artifacts listed below in Exhibit 1. These included famous calligraphic works and paintings such as Guo Xi's *Early Spring* (Song Dynasty), artifacts such as the Ding Cauldron of Duke Mao of the Western Zhou Dynasty, and the Jadeite Cabbage of the Qing Dynasty. One particular work of note would be Zhao Chang's *Picture of the New Year* which was depicted using gigapixel technology so that online viewers could study the revitalized colors in detail.

In 2013, the NPM published its first 3-D epic movie titled *Rebuilding the Tongan Ships* to reimagine the historical grandeur of these 19th century vessels. The NPM invited experts, pioneering directors and 3-D animators to create a 50-minute-long 3-D documentary jointly. *Rebuilding the Tongan Ships* had a budget of over three million NT dollars and took two years to complete. Chou Wei-chiang, an Assistant Researcher in the NPM Department of Rare Books and Historical Documents, said:

We faced a major restriction when creating the model. The internal structure cannot be seen at all. We therefore utilized 3-D technology to dissect and reassemble the ship to tell the audience about the interior components. This is currently the only educational video available that comprehensively describes the various parts of an ancient Chinese junk (Chiang, 2013).

The documentary also shattered the preconception held by most people about documentaries being boring and stuffy videos. Instead, it offered the audience an almost lifelike banquet of visual and audio effects. The NPM also hosted the *Rebuilding the Tongan Ships - New Media Art Exhibit* where autostereoscope and augmented reality (AR) technologies were used as special exhibit features. Visitors could acquire AR[9] cards in the exhibit for a cosplaying experience, dressing up either as a Qing dynasty official or the pirate lord Cai Qian. The photos could be uploaded to social networks such as Facebook (National Palace Museum, 2013a).

Innovations in non-ICT-enabled services

The NPM has made great efforts to provide innovative non-ICT-enabled services. The Metropolitan Museum of Art in New York, USA, has been famous for developing innovative series of souvenir products and many visiting tourists would often spend more time in its souvenir shops than they would admiring the artworks of the museum themselves. Although museums in Taiwan had promoted their souvenirs and derivative merchandising for many years, the cultural and creative industries in Taiwan had stagnated because of the museum management's philosophies and inadequate design standards. Recently, the NPM has collaborated extensively with both local and foreign designers to make desirable cultural and creative products. For example, the NPM has worked with the renowned Taiwanese porcelain brand Franz to create the innovative artwork *Peach Blossoms and Two Swallows* based upon Giuseppe Castiglione's *Peach Blossoms*. Given new forms in exquisite works of porcelain outside the display cabinet, the famous painting is able to become part of people's daily lives (Epoch Times, 2005)

To inspire the cultural and creative industries in Taiwan further, the NPM has been hosting the following events to promote design and value-added culture since 2010: national treasure design competitions, art appreciation seminars, campus tours, conferences and exhibits of winning competition entries. The NPM hoped that these activities could inspire skilled professionals to become involved in cultural and creative design integration, add value to the cultural assets of Taiwan and promote the overall quality and quantity of the cultural and creative merchandise of Taiwan[10]. The first and second rounds of the competition were held in tandem with the *2011 National Treasure Exhibit*. Nineteen of the most popular merchandising lines, such as the reusable shopping bag decorated with the plum flower crest of the NPM, the *Jadeite Cabbage* umbrella, the *National Treasure is Fun* figurine series and the *National Treasure Meets Creativity* coaster were selected for sale in the NPM souvenir shop.

The cultural and creative merchandising sold by the NPM includes daily necessities, stationery and figurines, of which, the *Dragon Claw* bottle opener by the ASUS design team has been well appreciated by both local and international visitors due to its unique design and useful application. AGUA Design developed the *Imperial Consort* series which included affordable mugs, flip-flops and notebooks based on the famous *Imperial Consort Yang*. The series proved to be popular among the young generation. The NPM figurines included the bestselling *Katzfun* family based on the *Children Playing* artwork and the newest *Arahant* series developed by Bright Ideas Design. Pumpkin Creative also stirred up a fad with their *Big Personalities as Little Figurines* which were marketed via convenience stores around Taiwan (*Bright Ideas Blog, 2013*). The NPM also authorized two bedding companies to design sofas, sheets, bedding and sleeping furniture based on Huai Su's *Autobiography* and also designated sections of the artwork *Along the River During the Qing Ming Festival*. These products, priced in the tens of thousands of NT dollars, were exhibited in international furniture exhibits held in France and Italy (*Bright Ideas Blog, 2013*).

To promote practical learning and provide hands-on art experience, the NPM sought to engage the visiting public with different activities. For example, the NPM held the *Adventures in the NPM – an Exhibit of Replicas* at Chengjheng High School in Hsinchu County of Taiwan which deftly combined cultural elements with behavioral reforms. The aim of the exhibit was to introduce diversity into existing practices of corrective education. The *Adventures in the NPM – an Exhibit of Replicas* was divided into five exhibit zones based on different themes, namely, *National Treasure Figurine Series Video on Collection Replicas*, *Ultimate Porcelain*, *Stories in Artworks and Paintings*, *Calligraphy and the Form of Words*, *Creative Youth – Artworks by Students of Chengjheng High School* and *Investigative Learning*. A short animation was shown in the exhibit. Both multimedia learning facilities and a comprehensive selection of books were provided as well. Integrated media was used to provide the youths with an enriching experience for the senses and give them an in-depth appreciation for the beauty of learning. Six exciting artworks titled *Fantastic Vista in the Dwelling in the Fuchun Mountains*, *We Know this is Good*, *Inspiration from Letters on Floral Fragrance*, *Steps 1 and 2 of New Calligraphy*, *Refreshing White Jade and Green Flowers* and *National Treasures – Toy Story* were displayed alongside the 49 replica pieces from the NPM (*Bright Ideas Blog, 2013*).

The NPM has also been aware that the trend of digitalization has created strong connections between content, platform, media and creativity. New multimedia industries were on the rise in Taiwan and would continue to create novel forms of service models and would go on altering the expectations and behaviors of the public. In 2012, the NPM created an animated theater for *It's a Big World: Globetrotting* based on Ferdinand Verbiest's *Kunyu Quantu* map made during the Qing Dynasty. The video recreated the scene when Ferdinand Verbiest introduced the newest concepts in world geography and astronomy of that time to Emperor Kangxi. The NPM made use of a 3-D spherical map projected from the floor and star maps to lead the audience on an interactive journey to explore the map that combined both the Heavens and the Earth. A 360-degree panoramic projection technology was used to display the entire universe. Viewers could use their hands to draw the 12 constellations and touch the mythical beasts that appear during the video to unveil the evolution of these fantastic creatures. This innovative exhibition allowed visitors to experience how people in the ancient world studied the stars and drew maps (*CNA, 2013*).

Additionally, based on the *One Hundred Stallions* by Giuseppe Castiglione, the *Exhibition on Interactive Technology in Education – the Animated Work of One Hundred Stallions - Engaging History with Modern Approaches* was held in Huashan 1914 Creative Park in Taipei, Taiwan. The exhibit was planned by the Taipei Computer Association and jointly organized and endorsed by the NPM. Multiple forms of interactive technologies, such as motion sensing, AR, 3-D virtual imagery and multimedia digital content, were also used. The exhibit demonstrated how ICT could be used effectively to transform historical culture

and artistic sophistication into an interesting and interactive experience (*Commercial Times*, 2013).

With the guidance and support of the Board of Science and Technology, the Executive Yuan of Taiwan and the National Science Council of Taiwan, the NPM worked with the Institute for Information Industry of Taiwan and led teams from various industries to create the *Imperial Trend – A Grand Exhibit of New Media Art* exhibit in tandem with the annual NPM exhibit of *The All Complete Qianlong – The Aesthetics Taste of Qing Emperor Qianlong*. Again, the approach utilized technology to empower the digital collection of the NPM and integrate *ancient artifacts with modern technology* in a pioneering wave of new media art (*CTIMES*, 2013).

The NPM calendars have always been a most popular item in Taiwan. In 2013, the NPM began designing calendars based on the works of four renowned Ming dynasty calligraphers and painters, utilizing modern techniques to transform classical calligraphy and artworks into practical items that people can use in their everyday lives. Although the NPM calendars have been highly regarded for their artistic values, the museum has planned to adopt creative design approaches to make the calendars livelier to suit the tastes of the younger demographic (*China Times*, 2013a).

Highlight of the results

Innovations in ICT-enabled services:

Continuously digitalizing cultural assets of its collection, the NPM has achieved splendid results in participating in international competitions and in using the multimedia technologies available to share its digital collection worldwide. For example, in 2007, the NPM created the world's first 3-D animation titled *Adventures in the NPM* which won the first prize in the 2008 Tokyo International Anime Fair for the public section. The film also won the *Prix coup de Coeur* award at FIAMP (*Festival International de l'Audiovisuel et du Multimedia sur le Patrimoine*). The official NPM Web site also achieved an award for Web site esthetics at FIAMP, making it the only museum to win two major awards. The NPM was also the only museum in Asia to win an award, and received roaring public acclamation for the achievement. In the 2009 MUSE Awards organized by the Media & Technology Professional Network of the American Alliance of Museums, the NPM achieved silver awards for marketing development with *Inside: The Emperor's Treasure* and multimedia installations with *Passé-Future: The Future Museum of NPM*. In 2012, the NPM won gold awards in the interpretive interactive installations category with *Landscape Reunited – A New Multimedia Gallery of Huang Gongwang's Dwelling in the Fuchun Mountains* and the multimedia installations category with *Along the River, During the Ching-ming Festival – The Animated Scroll*. In 2013, the NPM once again entered the competition with its large-scale interactive title *It's a Big World: Globetrotting* and won a silver award in the games and AR category (*XKB News*, 2012).

At the 46th Houston International Film Festival, the NPM entries achieved a spectacular result by winning six major awards, including two platinums, two golds, one bronze and one Special Jury Award. The film entry titled *Journeying from Past to Present – APP minifilm* was a lighthearted comedy which achieved the highest accolade of the Platinum Award in the network category. Other winning entries included the animated films *Adventures of NPM: Meet the painting and calligraphy masterpieces*, *Adventures in NPM: Lost in the Art of Landscape Painting*, *Painting Anime: Along the River During the Ching-ming Festival*, *Journeying from Past to Present: A Life of Refined Tastes* and *The Heavenly Spirit of Calligraphy: The Development and Beauty of Chinese Writing* (*Merit Times*, 2013c). The NPM also plans to take its first step onto the global stage by releasing its landmark animated video *Adventures in the NPM* worldwide. The *Adventures in the NPM* release will include other treasures from the Palace Museum in Beijing to inspire collaboration between the NPMs in both China and Taiwan (*China Times*, 2013b).

The NPM was nominated as the seventh most popular museum destination worldwide for two consecutive years in 2012 and 2013 by *The Art Newspaper* of London. The NPM is also the only museum in Asia to be in the top ten (after France, the USA and the UK). This stated that the professional exhibits, installation, promotion of education and visitor services at the NPM have achieved the recognition of visitors worldwide[11].

In 2012, the NPM was given a Certificate of Excellence by TripAdvisor, a renowned British travel Web site, in recognition of its services. The TripAdvisor Web site showed that the NPM has been recommended by many tourists due to its rich collection of artifacts from the Chinese civilization and its integration of modern technology and historical traditions. Many tourists also appreciated the real-time updates of exhibit information that the NPM has posted on its Facebook page[11].

Business usually cools-off during June, as the month coincides with final exams in schools. In 2011, however, the *Landscape Reunited – Huang Gongwang and Dwelling in the Fuchun Mountains* and the corresponding *New Media Art* exhibits attracted 3.85 million visitors to the NPM. The number of visitors reached another record high of 4.36 million in 2012. One of the NPM's employees expressed their opinion that many visitors came from central or southern Taiwan and were first-time visitors to the NPM. These visitors may not know who *Huang Gongwang* was or the authenticity of *The Ziming Scroll* or *The Wuyong Version*, but it was very moving to see these visitors immersing themselves in an artistic environment[12].

The joint collaboration with Google provided good results. For example, when the NPM held a press conference with Google to announce the joint collaboration, over 100 media reports covering the event were publicized. The NPM Web site's visits from the USA during a given period increased from 8.52 per cent in 2011 to 17.01 per cent in 2012, ([2012 Annual Performance Report of the National Palace Museum, 2013](#)) proving the effectiveness of improved exposure. Kung-hsin Chou, Director of the NPM, stated that the joint collaboration with Google was a successful Internet-based promotion and attracted many visitors to the NPM to appreciate the actual physical artifacts. Because the NPM is the de facto leader of museums in Taiwan, its efforts in creating an extensive digital collection, its commitment to service innovations and its adoption of digital service technologies and concepts have helped provide a good example to other museums in Taiwan. For example, the National Museum of Prehistory in Taitung also allowed visitors to view museum interiors via Google Street View[13]. Under the leadership of the NPM, Chinese civilization in Taiwan is being promoted globally (Huang, 2013).

Innovations in non-ICT-enabled services:

The design and development of cultural and creative merchandise for the NPM has been one of the most representative case studies in Taiwan. Currently, over 4,300 cultural and creative products, such as stationery, lifestyle and decorative items, fashionable items, books and multimedia, calligraphy and artworks, as well as bestselling gifts have been designed[14]. The ranges of cultural and creative products released by the NPM are becoming more diverse and popular among the public. Hsu Hsiao-te, chief of the cultural marketing department of NPM responsible for the promotion of cultural and creative merchandising, explained that the NPM could not attract younger visitors in the past. However, this no longer holds true as many younger visitors nowadays visit the NPM specifically to buy its products. For example, the NPM has collaborated with Starbucks and released a series of seven items including tumblers, dual-layered porcelain cups and cards. The porcelain cups sold out within ten days. The NPM figurines from the series *Famous Personalities* were also much sought after upon their release. The first batch of 500 figurines was sold out within five days. In 2013, *Acknowledged*, a paper tape product based on *Emperor Kangxi's* approval written in red ink sold out almost immediately and still remains a popular item. The popularity also spread to mainland China where many unauthorized counterfeits appeared in the market there as well. Recent statistics reveal that

merchandising helped the NPM secure a sales volume of 700 million NTD in 2012. Currently, the NPM is ranked fourth in the world in terms of its integrative cultural and creative capabilities (*CD News*, 2013).

Challenges

Despite the great achievements described in previous sections, the NPM has coped with numerous challenges. Digital archivists recruited by the NPM are an ensemble of specialists from different professional backgrounds and skills and are responsible for transforming physical documents and artifacts into digital forms. For the digitalization of the NPM collection, the archivists' roles and responsibilities are divided into the following: collection conservators, database managers, Web site interface designers and project managers (*Fubon Young Career*, 2009).

"It is necessary to establish the digital collection system in order to generate and maintain digital collection contents," said the project assistant, Tung-chih Hsieh. Mr Hsieh has worked at the NPM for four years, and witnessed how the National Digital Archives Program began from scratch and slowly progressed to its current state. Hsieh has a graduate degree in history and is responsible for establishing the database for the Department of Painting and Calligraphy at the NPM. He must find historical documents and information for every item listed in the catalog, input the data in a new digital format and upload them to the NPM database. The peculiar difficulty of this task is that it requires an archivist who is familiar with both history and the artifacts. Taking Zhao Mengfu's famous painting *Autumn Colors on the Que and Hua Mountains* from the Yuan Dynasty as an example, despite having plenty of background information, there was still a challenge of identifying the annotations and stamps on the artwork, which number about a hundred. The archivist has had to identify the owner of each stamp as well as their position and describe the meaning of the stamp in the context of the artwork, and then enter each detail onto the database. Usually, stamp owners would use a personal name in their seals. For example, the seal of *Secret Collector of Calligraphic Works* (Molin Miwan) belongs to the collector Yuan-bian Xiang. Only those who are familiar with the stamps would be able to identify the owner because a lot of information has not been formally organized (*Fubon Young Career*, 2009).

The NPM has a massive collection. On average, the Department of Painting and Calligraphy has to process at least 2000 items and upload them to the database every year. The complexity may also vary based on the type of work processed. Some may be completed within two-three days. Others, like *Autumn Colors on the Que and Hua Mountains*, would take weeks, even in the hands of an expert (*Fubon Young Career*, 2009).

The NPM also places great importance on the physical and Internet security of its collection during digitalization and the provision of ICT-enabled services. The NPM verifies and validates safety concerns and is extra-mindful of the security regulations provided. For example, Google provides safety protection for its official Web sites (high-quality picture files are displayed under intellectual property protection and cannot be downloaded or copied). These security measurements provide an adequate guarantee to the NPM (*Epoch Times*, 2012).

When art meets technology, sparks of innovation would fly and breakthroughs would be made, giving birth to various types of digital content. However, getting people from different fields and agencies to work together in the service of design and testing can be a challenging process. Conflicts, negotiations and disagreements are inevitable. Each party must be open-minded and willing to learn from others to achieve great results. The project *Adventures in the NPM*, which lasted for over a year, was no exception. For example, Digimax Inc. has sharp market sensitivity and places an emphasis on entertainment value. The NPM, on the other hand, likes to make sure that the work has sufficient incorporated educational content. This required an appreciation of balance on both sides. There were also some lessons learned from the selection of characters in the animated videos. Digimax wanted anthropomorphic characters with hands and feet which went against the NPM's

preference for cauldrons and other more-representative artifacts from the museum collection. In the end, a special solution was utilized to present the artifacts. For example, the Xi Zun wine cups dating back to the Warring States Era would appear on the scene in a drunken stupor. The Chinese painting of the *Carp Leaping through the Dragon's Gate* was also presented in 3-D. The creators presented the unique characteristics of the inanimate artifacts by using solutions that came by thinking outside of the box of traditional museum collection presentation ([Industrial Technology, 2007](#)).

In addition, the NPM has rigorous requirements for cultural and creative merchandise, especially for the texture and representation of cultures. For example, when creating *Adventures in the NPM*, the NPM requested that the coloration, quality, design and texture of the bronze and jade characters in the video depict the actual artifacts accurately. Special attention was paid to avoid depicting the national treasures in the animation as though they were cheap counterfeits. Digimax, lacking these techniques, met an obstacle. Having the work outsourced to the USA would have taken up to a month which was too long. In the end, the R&D department at Digimax developed new technologies in the course of a few days, using 3-D techniques to generate several lifelike 3-D models which were then inspected and verified by NPM employees. Non-photo-realistic (NPR) rendering was also used to present lifelike motions in the NPM animated videos. 3-D paintings were created using 3-D photography technologies from the Industrial Technology Research Institute, while 3-D interactive video displays were made using microphase-separated films[15]. The amount of attention and consideration that went into details and accuracy was much higher than is standard for commercial films. The collaborative relationships between the NPM and its partners would only get closer and more tight-knit to create higher quality merchandise.

The NPM does not want any unlicensed or illegal use of pictures from its collections. Hence, Internet protocol (IP) licensing has always been an important topic for the NPM. Discussions are still ongoing about whether or not to allow access to pictures or photos by the public as and about the methods for allowing access if these pictures were to be provided. Lucifer Chu, the director of the Foundation of Fantasy Culture and Art, made the following comments for the authorization of videos and photos by the NPM:

Is it possible for the National Palace Museum to allow all its videos and pictures for the public to download freely instead of commercializing them, just as MIT had done with the Open Course Program? MIT Open Course has attracted over one million users every month. Since 2006, over 17 per cent of the newly admitted MIT freshmen have reported that they decided to enter MIT after they experienced the excellent educational standards provided at the university by attending these free courses. MIT is ranked as one of the top five educational institutions in the world. However, there is only one National Palace Museum in the entire world. If MIT can do it, the NPM should do a better job.

If I were the Director of the NPM, I would open all digital contents for non-commercial use. All potential users of these pictures/photos would use their own computers and bandwidth to disseminate the beauty of the NPM through YouTube videos, upload Along the River During the Qing Ming Festival to Flickr, and send photos of dragon vases to their friends. The NPM could acquire fans worldwide as advertisers without spending any money. Additionally, these photos and video files could be replicated and disseminated around the world. These duplications would do no harm to either the original artifacts or the NPM ([Commercial Times/Commercial Management/Management Know-hows/D3 Lucifer Chu, 2007](#)).

However, Dr Chung-hsin Chang from the Graduate Institute of Patent in the National Taiwan University of Science and Technology explained the reasons the NPM should retain its copyrights:

NPM artifacts include cultural treasures that have been passed down for over thousands of years. Due to their antiquity, these artifacts now belong to the public and are no longer entitled to copyright protection. However, the collection also includes works by famous artists in the modern era such as Chang Dai-chien and Zao Wou-ki that should be given copyright protection. Derivative works such as Palace Museum Collection Monthly, tour guide brochures,

anthologies, picture albums and videos developed by the NPM that are based on historical artifacts are also entitled to copyrights as well. The duplication of ancient artifacts in the public domain not protected by copyright laws would still require licenses and supervision from the NPM according to article 69 of the Cultural Heritage Preservation Act. In other words, despite the lack of legal basis, the NPM can still be regarded as the owner of these unique cultural artifacts by acting as the custodian of the indicated artifacts, and reserve the right to limit the access to its collection. Anyone without explicit permission from the NPM would not be given access (Chang, 2005).

Concepts of copyright protection are also changing in the ICT era. Dr Chen-yu Feng from the Graduate Institute of Technology, Innovation and Intellectual Property Management of the National Chengchi University raised these issues in his *Trends and Challenges in the Utilization of Digital Images*:

With the popularization of handheld mobile devices and cloud applications, coordinating network effects and increasingly efficient digital license management systems, image licensing is expected to develop into a mature industry. As the world undergoes these major transformations, the Chinese language market should consider whether to develop a basic licensed platform for Chinese language digital images and videos. Developing a joint licensed platform between China and Taiwan may be an option to consider. Taking the Jadeite Cabbage as an example, this artifact provides the NPM about 100 million NTD worth of copyright fees every year. The NPM is thus committed to tracking down unlicensed use of its images. For example, the NPM has requested Farglory Group to pay the license fees for using photographs of the Jadeite Cabbage on UDN News (Feng, 2013).

Additionally, the NPM has designed and developed a diverse selection of cultural merchandise, which are some of the bestselling souvenirs for mainland Chinese tourists. However, counterfeits have emerged as a result of the immense popularity enjoyed by these goods. For example, the *Acknowledged* tape from the exhibit on *Emperor Kangxi* had been counterfeited into other forms of products and *Acknowledged* toilet rolls have even appeared in China. Piracy is a major concern in mainland China. To protect the rights of the general public as well as the Museum, the NPM submitted an application in 2013 with its brand name and logo. However, the brand name of the Palace Museum has already been registered in China. Therefore, the NPM needs to defend its brand name and trademark, and should submit its objection to the Trademark Office in China to prevent unlicensed and illegal behaviors from affecting the market reputation of the NPM (*China ETTV News*, 2013).

The future of Chinese cultural and historical artifacts

The past does not dictate the present. People should not dwell in the experiences of past success, but should keep their eyes ever forward.

Wayne Pai (Source: Tsaih and Meister, 2009).

Keywords:
Information and
communication technologies
(ICT),
ICT-enabled services,
Service innovation,
Museum

The NPM has faced many challenges in the process of implementing ICT applications and service innovations, including contrary opinions from the general public, government and academia. Despite its success in overcoming many challenges, the NPM is still deliberating upon and assessing the risks as it continues to plan new means of reviving Chinese cultural and historical artifacts and improving the general understanding of these objects in an effective and sustainable manner. Achieving this would definitely attract more visitors to the NPM to embark on an intellectual journey!

Notes

1. The National Digital Archives Program places equal emphasis on culture and technology, and is the only national program in the field of humanities and culture. The Digital Archives would also accelerate improvements of our cultural and information industries and help establish a competitive advantage for academic developments. This program has the objectives of showcasing the diversity of Taiwanese culture and nature, improving the integration of museum collection and technology with educational, research, industrial and social developments, promoting globalization of the museum collection,

establishing and implementing a global collaboration network and bridging the technological gap (National Digital Archives Program, 2008).

2. The National Palace Museum Organization Act, 2008.
3. The Cultural and Creative Project has been initiated to provide interdisciplinary cultural creativity that combines cultural and technological elements. This project focuses on using the cultural wealth and international fame of the NPM as a basis to construct a platform for the cultural and creative industries to trigger the interdisciplinary integration of culture and technology simultaneously, promote the technological industries to adopt cultural and creative elements, organize online events and training programs for the promotion of culture and creativity and enhance the esthetic tastes as well as cultural creativity of the people inspired anew by the integration of technology and culture.
4. What is the Digital Archive? The NPM Program for establishing a Digital Knowledge and Intricate Collection Database, available at: www.npm.gov.tw/da/ch-htm/about03-1.html (accessed November 27, 2013).
5. Mobile applications (usually abbreviated as "mobile app" or simply as "app") refer to computer software applications designed for smartphones, tablets or other mobile devices (Wikipedia, 2013a).
6. iPad is a line of tablet computers designed and marketed by Apple Inc. which run with the iOS operating system developed by the same company (Wikipedia, 2013b).
7. QR codes are a type of dimensional code developed by the Japanese DENSO WAVE company in 1994 <http://zh.wikipedia.org/wiki/%E6%97%A5%E6%9C%AC>. The developers have intended that the contents encoded within the QR code can be deciphered quickly. QR codes are most commonly seen in Japan and are currently the most popular two-dimensional barcode system in the country. QR codes can store more information compared to traditional codes. Unlike traditional barcodes that must be aligned in a straight line when being scanned, QR codes are not restricted by orientation. Source: <https://zh.wikipedia.org/wiki/QR%E7%A2%BC>, (accessed August 12, 2013).
8. Chief editor of the Bluephoenix New Media Arts; famous works include multimedia installations in Hall 1 and designs for the 360-degrees interactive theater in Hall 3 of the *2010 Taipei International Flora Expo Pavilion of Dreams*.
9. AR – a technology where the position and angle of the camera is calculated in real time and supplemented using corresponding images. The aim of AR is to add interactive virtual elements into the real world. This technology was first proposed in 1990. As the processing capabilities of mobile devices increase, the use of AR should become more and more widespread (Wikipedia, 2013c).
10. Source: 2012 Annual Performance Report of the National Palace Museum.
11. The National Palace Museum/Public Announcements, available at: www.npm.gov.tw/zh-TW/Article.aspx?sNo=04003978 (accessed November 16, 2013).
12. *Dwelling in the Fuchun Mountains* Exhibit in Taipei Attracted a Record Breaking 500,000 Visitors, available at: http://big5.china.cn/gate/big5/art.china.cn/education/2011-08/03/content_4380789.htm (accessed 3 August 2011).
13. Interior View of the Prehistory Museum from Google: <http://goo.gl/maps/yiv8e>
14. Annual Performance Report of the National Palace Museum, available at: www.npm.gov.tw/zh-TW/Article.aspx?sNo=04003978
15. Microphase-separated films are a key component for displaying 3-D images. This is a type of thin-film optics on a glass substrate. The film is composed of crisscrossing strips with two optical characteristics (zero phase shift or half-wavelength phase shift). This can be applied to the surface of LCD screens to achieve 3-D image display. The Industrial Technology Research Institute made use of laser scanning to generate this film. This method has many advantages such as low equipment cost, low spatial requirements, ease of operation and environmental friendliness. Unassisted 3-D imaging that does not require special 3-D glasses was the result (DIGITIMES, 2013).

References

Annual Report 2010 (2010), "Annual report 2010 of the NPM, a word from the director", p. 4, available at: www.google.com.tw/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&ved=0CC4QFjAA&url=http%3A%2F%2Fwww.npm.gov.tw%2Fen%2Fdown.ashx%3FfsNo%3D10000264&

ei=cqSJUufVB4-AkgWRjYC4AQ&usg=AFQjCNG6oc6Y5vcHgpai1Z65PMrPPiR7SA&sig2=7MYhibhoXhHb7GrvBzSkqA (accessed 18 November 2013).

Bright Ideas Blog (2013), available at: <http://blog.brightideas.com.tw/?p=48> (accessed 14 November 2013).

CD News (2013), "News from China and Taiwan: Taiwanese cultural and creative industry burning bright", available at: www.cdnews.com.tw/cdnews_site/docDetail.jsp?coluid=111&docid=102527739 (accessed 15 2013).

Chang, C.-H. (2005), "Authorization for palace museum collection and artifacts", available at: www.copyrightnote.org/crnote/bbs.php?board=1&act=read&id=61 (accessed 19 November 2013).

Chen, H.-L. (2013), "A living and breathing *Dwelling in the Fuchun Mountains* powered by 3D digital technology", available at: <http://msnews.n.yam.com/mkarticle.php?article=20110601012819> (accessed 20 November 2013).

Chiang, C.-L. (2013), "3-D documentary movie from the Palace Museum - rebuilding the Tongan ships", available at: http://news.rti.org.tw/index_newsContent.aspx?nid=407401 (accessed 16 November 2013).

China ETTV News (2013), "Acknowledged fad – counterfeit toilet rolls appears", *China ETTV News*, 3 September, available at: <http://tw.news.yahoo.com/%E6%9C%95%E7%9F%A5%E9%81%93%E4%BA%86-%E6%9A%B4%E7%B4%85-%E5%A4%A7%E9%99%B8%E5%87%BA%E5%B1%B1%E5%AF%A8%E8%A1%9B%E7%94%9F%E7%B4%99-071922645.html> (accessed 25 November 2013).

China Times (2013a), "New calendars released by the NPM - classical Chinese artworks attracting many visitors", available at: <http://news.chinatimes.com/mainland/17180504/112013102200502.html> (accessed 2 November 2013).

China Times (2013b), "Taiwanese animation techniques astonishes Chinese media groups", available at: www.chinatimes.com/newspapers/%E5%8F%B0%E7%81%A3%E5%8B%95%E7%95%AB%E6%8A%80%E8%A1%93-%E9%99%B8%E5%AA%92%E5%9C%98%E9%A9%9A%E8%B1%94-20131031001023-260301 (accessed 11 November 2013).

China Times/Taitung News/C2 Cheng Chieh-cheng/Taitung (2005), available at: http://kmw.ctgin.com/member/news_search2/se_content_file8.asp?query=%ACG%AEc%26%BC%C6%A6%EC%BE%C7%B2%DF&src=B&date=20050930&file=N0663.001&dir=B&area=tw&frompage=se (accessed 18 November 2013).

CNA (2013), "It's a big world: globetrotting - NPM to win a silver from the MUSE awards", available at: www.cna.com.tw/news/aEDU/201306040313-1.aspx (accessed 16 November 2013).

Commercial Times (2013), available at: www.chinatimes.com/newspapers/%E7%99%BE%E9%A7%BF%E5%9C%96%E4%BA%92%E5%8B%95%E6%95%99%E8%82%B2%E5%B1%95-%E9%96%80%E7%A5%A8%E9%96%8B%E8%B3%A3-20131024000290-260208 (accessed 14 November 2013).

Commercial Times/Commercial Management/Management Know-hows/D3 Lucifer Chu (2007), available at: http://kmw.ctgin.com/member/news_search2/se_content_file8.asp?query=%ACG%AEc%B3%D5%AA%AB%B0%7C65%B8U4193%A5%F3%A7%40%AB%7E&src=A&date=20070423&file=N0287.001&dir=A&area=tw&frompage=se (accessed 19 November 2013).

Commercial Times/Technology/Panel 10 Ying-wei Ho/Taipei (2005), available at: http://kmw.ctgin.com/member/news_search2/se_content_file8.asp?query=%ACG%AEc%26%BC%C6%A6%EC%A8%E5%C2%C3&src=A&date=20050530&file=N0091.001&dir=A&area=tw&frompage=se (accessed 18 November 2013).

CTIMES (2013), available at: www.ctimes.com.tw/DispNews-tw.asp?O=HJXA88F9G4ISAA00ND (accessed 14 November 2013).

DIGITIMES (2013), "DIGITIMES Chinese - 360 degrees in technology - microphase separated films", available at: www.digitimes.com.tw/tw/dt/n/shwnws.asp?CnIID=10&id=0000062851_B7B15R964U4J0I82VA5FF&ct=2#ixzz2IAaKwJ2f (accessed 14 November 2013).

Epoch Times (2005), "A novel method of digitalization with the National Palace Museum in Taiwan and Franz porcelain", available at: www.epochtimes.com/b5/5/8/11/n1015373.htm (accessed 8 November 2013).

Epoch Times (2012), "Google to explore Taiwan's National Palace Museum and Chinese civilization", *Epoch Times*, 15 April, available at: www.epochtimes.com/b5/12/4/15/n3566465.htmGoogle%E9%81%A8%E9%81%8A%E6%95%85%E5%AE-%E6%8E%A2%E7%B4%A2%E4%B8%AD%E8%8F%AF%E6%96%87%E5%8C%96 (accessed 25 November 2013).

Feng, C.-Y. (2013), "Establishing a social forum of the future: cultural innovation meets cloud technology - innovative services of the NPM - trends and challenges in the use of digital images", available at: www.nccu.edu.tw/mobile/announcement_content/5254b0de1d41c86915000002 (accessed 19 November 2013).

Fubon Young Career (2009), available at: http://fubon.career.com.tw/CareerGuide/FrontShow/paper_display.aspx?apmenu_id=149&menu_id=8&submenu_id=407 (accessed 14 November 2013).

Huang, M.-T. (2013), "Google street view displays interiors of the museum of prehistory", *Liberty Times*, available at: www.libertytimes.com.tw/2013/new/aug/9/today-south4.htm (accessed 14 November 2013).

Huang, S.-Y., Chao, Y.-T. and Tsaih, R.-H. (2013), "ICT-enabled service design suitable for museums – the case of the iPalace channel of the National Palace Museum in Taipei", *Journal of Library and Information Science*, Vol. 39 No. 1, p. 91.

Industrial Technology (2007), available at: <http://blog.roodo.com/mdstuffs/archives/5553717.html> (accessed 14 November 2013).

Merit Times (2013a), "Romantic nights at the NPM and creative aesthetics - Mun-lee Lin revitalizes the palace museum", available at: www.merit-times.com.tw/NewsPage.aspx?unid=66918 (accessed 27 November 2013).

Merit Times (2013b), available at: www.merit-times.com.tw/NewsPage.aspx?unid=307673 (accessed 14 November 2013).

Merit Times (2013c), available at: www.appledaily.com.tw/realtimenews/article/new/20130430/177563/ (accessed 14 November 2013).

National Digital Archives Program (2008), "National digital archives program phase 2 program summary - national digital archives program - program", available at: www.ndap.org.tw/1_intro/intro.php (accessed 27 November 2013).

National Palace Museum (2002), "Reviving the charm of an ancient collection and creating new vales for generations to come - results of the digital museum program 2002", available at: www.npm.gov.tw/digital/index3_3_2_ch.html (accessed 18 November 2013).

National Palace Museum (2013a), "Experience life one hundred years ago at *Rebuilding the Tongan Ships - New Media Art Exhibit*", available at: www.npm.gov.tw/zh-tw/Article.aspx?sNo=04004980&print=1 (accessed 16 November 2013).

National Palace Museum (2013b), available at: www.npm.gov.tw/en/Article.aspx?sNo=04000588 (accessed 27 November 2013).

National Palace Museum (2013c), "The National Palace Museum cultural and creative resources website", available at: http://ccp.npm.gov.tw/content/plans/plans_01.aspx (accessed 27 November 2013).

NPM/Press Section (2012), "The palace museum to be part of the Google Art Project", available at: <http://webcache.googleusercontent.com/search?q=cache:r7plgkL2e1gJ:www.npm.gov.tw/zh-tw/Article.aspx%3FsNo%3D04003867+%&cd=11&hl=zh-CN&ct=clnk&gl=tw> (accessed 25 November 2013).

Tsaih, R.-H. and Meister, D. (2009), *Polaris 2008*, College of Commerce, National Chengchi University, and Ivey Management Service, Taiwan, p. 6.

Wikipedia (2013a), available at: <http://zh.wikipedia.org/wiki/%E6%B5%81%E5%8B%95%E8%BB%9F%E4%BB%B6%E6%87%89%E7%94%A8%E7%A8%8B%E5%BC%8F> (accessed 27 November 2013).

Wikipedia (2013b), available at: <http://zh.wikipedia.org/wiki/IPad> (accessed 27 November 2013).

Wikipedia (2013c), available at: <http://zh.wikipedia.org/wiki/%E6%93%B4%E5%A2%9E%E5%AF%A6%E5%A2%83> (accessed 18 November 2013).

XKB News (2012), "The National Palace Museum wins 2 gold in the MUSE awards of the American alliance of museums", available at: www.xkb.com.tw/art-show.asp?id=1051 (accessed 25 November 2013).

Yeh, K.-Y. (2008), "Evaluating the museum organization", *Museology Quarterly*, Vol. 22 No. 1, pp. 5-20.

Exhibit 1

Table E1 Selected artifacts from the Google Art Project

<i>Item</i>	<i>Era</i>	<i>Collection title</i>
1	Song Dynasty	Zhao Chang's <i>Picture of the New Year</i>
2	Song Dynasty	Fan Kuan's <i>Travelers Among Mountains and Streams</i>
3	Song Dynasty	<i>Early Spring</i>
4	Late Liangzhu Culture	Cong tube
5	Late Shang to Early Zhou	Square Gui Food Container
6	Late Western Zhou Dynasty	Ding Cauldron of Duke Mao
7	Mid-Warring States Period	Oblation Zun with Turquoise Inlay and Gold Filament
8	Northern Wei Dynasty—First Year in the Reign of Taihe	Seated Sakyamuni Buddha
9	Northern Song Dynasty	Warming bowl in the shape of a flower with light bluish-green glaze, Ju ware
10	Northern Song Dynasty	Ting Ware White Ceramic Pillow in the Shape of a Child
11	Southern Song Dynasty	Mallet-Shaped Long-quan Vase with Two Phoenix Handles Celadon vase with phoenix-shaped handles, Long-quan ware
12	Yuan Dynasty	Jun Ware Pillow in the Shape of a Ru-yi
13	Ming Dynasty—Reign of Emperor Yong-le	Blue-and-white Flat Vase with Figures
14	Ming Dynasty, Reign of Emperor Chenghua	Dou-cai Cup with Chickens
15	Qing Dynasty	Jadeite Cabbage
16	Qing Dynasty—Reign of Emperor Yongzheng	Vase with Coiled Dragons and Peonies Decoration
17	Qing Dynasty—Reign of Emperor Qianlong	Revolving Vase with Swimming Fish Decoration
18	Qing Dynasty—Reign of Emperor Qianlong	Square Sandalwood Curio Box, Containing Thirty-two Curios

Source: The National Palace Museum

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Teaching notes

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Case summary

This teaching case, titled *National Palace Museum and Service Innovations*, describes the digital technology applications and the service innovations that have been implemented between the years 2002 and 2013 by the NPM in Taiwan (hereafter abbreviated as the NPM). This teaching case indirectly and comprehensively summarizes the challenges encountered during the implementation of the innovations and the corresponding solutions.

In recent years, the NPM has been shifting its operational focus from being object-oriented to being public-centered, and the museum has held not only the physical forms of artifacts and documents but also their digital images and metadata. These changes would inject new life into the collection of historical artifacts. In addition, the NPM's archives and its collections would be given a refreshingly new public image and connect it with people's daily lives. Among these endeavors for displaying historical artifacts online and maintaining Chinese cultural relevance in the modern age, the key issues are related to digital technology applications and service innovations. The service innovations would be further divided into those enabled by ICT- and non-ICT-enabled ones. These shifts clearly show that adopting digital technologies and innovative services can bring positive impacts for the museum. Having begun the process, the NPM administrative team wants to keep infusing life into ancient artifacts and texts, sustaining the public's curiosity for Chinese culture and history and provoking their interest enough to visit the NPM in person. However, to develop its plan for the future while reviewing the past, the NPM administrative team has had to reflect deeply on the steps it takes in terms of implementing service innovations.

Educational goals of this teaching case

- students will learn of the motivations for digitalization and service innovations from the organizational perspective and be shown the necessities of technological implementation;
- students will understand the difference in innovations between ICT-enabled services and non-ICT-enabled services;
- students should be able to understand the process of developing a new service; and
- students will be made aware of the challenges that an organization would face when developing a new service.

Courses and targets

This teaching case can be used for the graduate-level courses "Innovation Management" and "Service Innovation". It can be used for discussions about how bricks-and-mortar (B&M) organizations can enhance their creativity and maintain a competitive advantage within the rapidly digitalizing society, while meeting up-to-date expectations and responsibilities. This teaching case can also give ideas about ways for generating innovative strategies and actively promoting new activities to retain existing customers and attract new ones. At the same time, the teaching case will help students understand the challenges that organizations will face during the process. This teaching case can also be used for the graduate-level course "Cultural and Creative Industries". Students can discuss how traditional cultural industries should respond and formulate new strategies in a society undergoing rapid digitalization. The content of this teaching case is suitable for discussing how to invigorate stagnating organizations and what kind of mindset such organizations should have to collaborate with their business partners.

Assignments

The focus of this teaching case is to help students understand why B&M organizations must undergo service innovations and confront the challenges and issues that organizations inevitably face when developing new services. Instructors may brainstorm the following issues with their students:

- Why must the NPM pursue service innovations? What are its motivations for doing so?
- From the NPM perspective, what are the differences between ICT-enabled services and non-ICT-enabled services?

- From the NPM's perspective, what are the processes required to develop a new service?
- If the NPM were to pursue a new service, which departments/functions would be involved?
- What are the issues and challenges that may be encountered when the NPM carries out service innovations?
- What kind of values can the NPM expect to encounter within the context of service innovation?
- If you were a consultant to the director of the NPM, what would your suggestions be for infusing life into its collections of ancient artifacts and texts in a sustainable and effective manner?

Teaching process

The recommended time allocation (about 90 minutes) for discussing the aforementioned issues is as follows:

- Before discussing the teaching case, the instructor may first ask students about the unique features of the NPM and its position in its society. Then, ask why the NPM must pursue service innovations. (5 minutes)
- From the NPM perspective, what are the differences between ICT-enabled services and non-ICT-enabled services? What are the unique features for each service category? (10 minutes)
- From the NPM perspective, what are the processes required to develop a new service? (20 minutes)
- If the NPM were to pursue a new service, which departments/functions would be involved? (15 minutes)
- What are the issues and challenges that may be encountered when the NPM carries out service innovations? (20 minutes)
- What kind of values can the NPM expect to encounter within the context of service innovation? (10 minutes)
- If you were a consultant to the director of the NPM, what would your suggestions be for infusing life into its collections of ancient artifacts and texts in a sustainable and effective manner? (10 minutes)

Each of these issues is discussed in more detail.

Issue 1: Why must the NPM pursue service innovations? What are its motivations for doing so?

As stated on page 1 of the case, the NPM issued an advertising image titled “*Old is New*” based on “*A Letter on Floral Fragrances*” by the Song Dynasty calligrapher Tingjian Huang in 2006, and announced its new vision “*Reviving the Charm of an Ancient Collection and Creating New values for Generations to Come*” in 2010. Furthermore, the NPM has been shifting its operational focus from being object-oriented to being public-centered, and the NPM's holdings now come not only in the physical form of artifacts and documents but also in their collections of digital images and metadata. For the shifting vision and operational focus to succeed, the NPM wants to change its image from that of being a traditional antiques silo into one where it is an active participant in social education. These shifts are intended to inject new life into its collections of historical artifacts, and so archived collections would be given a refreshingly new image, be pushed beyond the museum walls to people who are able to view them online and thereby become connected with people's daily lives.

In summary:

- the museum's operational focus has shifted from being object-oriented to being public-centered;
- museums must change their image from being traditional antiques silos into becoming active participants in social education;
- since the NPM formally initiated the National Digital Archives Program in 2002,

numerous technological and digitalization projects, sponsored by the government in Taiwan, have been completed (Refer to pages 5 and 6 of the case); and

- since 2010, the government has designated the NPM as the leading flagship of the cultural and creative industries in Taiwan (Refer to page 10 of the case).

Service innovations should help inject new life into the NPM's collection of historical artifacts and push the archived collections out to people who can view them online and thus connect the NPM with people's daily lives. As Schumpeter (1934) stated, to diffuse the innovation, the invention should be acceptable to the society and deliver value to customers (or, in this case, the visitors of the museum).

Issue 2: From the NPM's perspective, what are the differences between ICT-enabled services and non-ICT-enabled services?

Table I shows a summary of the statements of subsections of innovations in ICT-enabled services and innovations in non-ICT-enabled services derived from the case. In addition, the prerequisite necessary for the establishment of ICT-enabled services would be the strengthening of the NPM's existing digital infrastructure. During its participation in the National Digital Archives Program, the NPM has adopted pioneering high-tech methods, such as digital photography and 3-D modeling, to manage its collection, allowing the museum to retain the physical integrity and value of its collection indefinitely in the digital era. In terms of non-ICT-enabled services, the NPM has collaborated extensively with both local and foreign designers to make cultural and creative products. For example, the NPM has worked with the renowned Taiwanese porcelain brand Franz to create the innovative artwork *Peach Blossoms and Two Swallows* based on Giuseppe Castiglione's *Peach Blossoms*. To inspire the cultural and creative industries in Taiwan further, the NPM has hosted the following events to promote design and the value-added merchandising culture: national treasure design competitions, art appreciation seminars, campus tours, conferences and exhibits of winning competition entries.

Issue 3: From the NPM's perspective, what are the processes required to develop a new service?

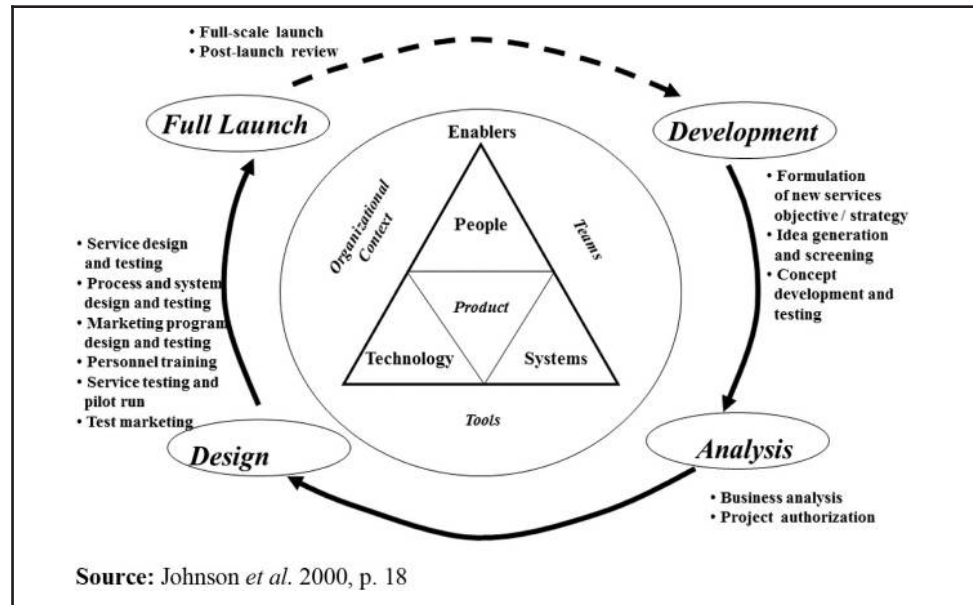
As shown in Figure 4, to develop new services, the process must include the phases of development, analysis, design and full launch:

1. Development (e.g. refer to the statements on pages 9, 11 and 12 of the case):
 - *Formulation of new service objectives/strategies*: For example, due to increasing competition in the cultural market and the emergence of cultural and creative industries, the NPM must go beyond its traditional functions (such as hosting exhibitions at the museum site) and get closer to the general public. Popular elements and technologies must be incorporated to add creativity to its services.
 - *Idea generation and screening*: For example, on page 9 of the case, the Metropolitan Museum of Art in New York, USA is cited as being famous for developing innovative series of souvenir products such that many visiting tourists would often spend more time in its souvenir shops than they would admiring the artworks on the museum's walls. On page 11 of the case, the NPM was also aware that the trend of digitalization has created strong connections between content, platform, media and creativity.

Table I Summary of the statements of subsections of innovations in ICT-enabled services and innovations in non-ICT-enabled services derived from the case

	<i>ICT-enabled services</i>	<i>Non-ICT-enabled services</i>
<i>Focuses</i>	IT empowerment for external customers, giving them a novel and independent role as active participants within the self-directed service system Incorporation of ICT for middle-office and back-office processes within or between organizations to streamline overall services	Development of creative derivative merchandising To promote practical learning and provide hands-on art experience, the NPM has engaged its visitors with activities designed for each age group Digitalization of information flows has helped to provide a high degree of integration between digital content, the delivery platform and media
<i>Features and characteristics</i>	Online, instantaneous and interactive Information-enriched, intelligent, automated and self-directed	Creative and innovative designs targeting different demographic groups

Figure 4 The new service development cycle



- Concept development and testing.
2. Analysis (e.g. refer to the statements in the second paragraph on page 12 of the case):
 - business analysis; and
 - project authorization:

(The teams plays the most important role during the *Development* and *Analysis* phases).
 3. Design (e.g. refer to the statements on pages 16, 17 and 18 of the case):
 - service design and testing;
 - process and system design and testing;
 - marketing program design and testing;
 - personnel training;
 - service testing and pilot runs; and
 - test marketing:

(Development of relevant tools is the most important step during the *Analysis* and *Design* phases).
 4. Full launch (e.g. refer to the statements in the second paragraph of page 11 and pages 18-20 of the case):
 - full-scale launch; and
 - post-launch review:

(The *Background of the Organization* plays the most important role between the phases of *Design* and *Full Launch*).

After Full Launch, certain promotional factors may be taken back to the first phase of Development for further improvement.

Issue 4: If the NPM was to pursue a new service, which departments/functions would be involved?

Below is a summary of the statements from the case.

- New services cannot be developed independently by a single department according to the current organizational chart of the NPM.

- *Relevant departments involved will include:* Intellectual Property (Department of Culture and Marketing), ICT (the Department of Education, Exhibition and Information Service), Academics (such as the Department of Painting and Calligraphy, the Department of Antiquities or the Department of Rare Books and Historical Documents) and Cloud-platform Services (Task Force for Vendor Management).
- Cross-functional collaboration is required for driving service innovations. In fact, cooperating with external organizations may be necessary as well.
- Designation of authority (every level of the NPM organization must understand the service innovation and be committed to it).

However, the NPM is a government department and faces restrictions in terms of manpower and budgeting. The organization is prone to stagnation in terms of human resources and job responsibilities, making it difficult to make adjustments despite the requirements of the new service. This is the main obstacle faced during the introduction of service innovations. Additionally, the NPM performs budgeting annually and is restricted in terms of the scope of items that contribute to its funding, which makes it difficult to drive long-term and sustainable innovations.

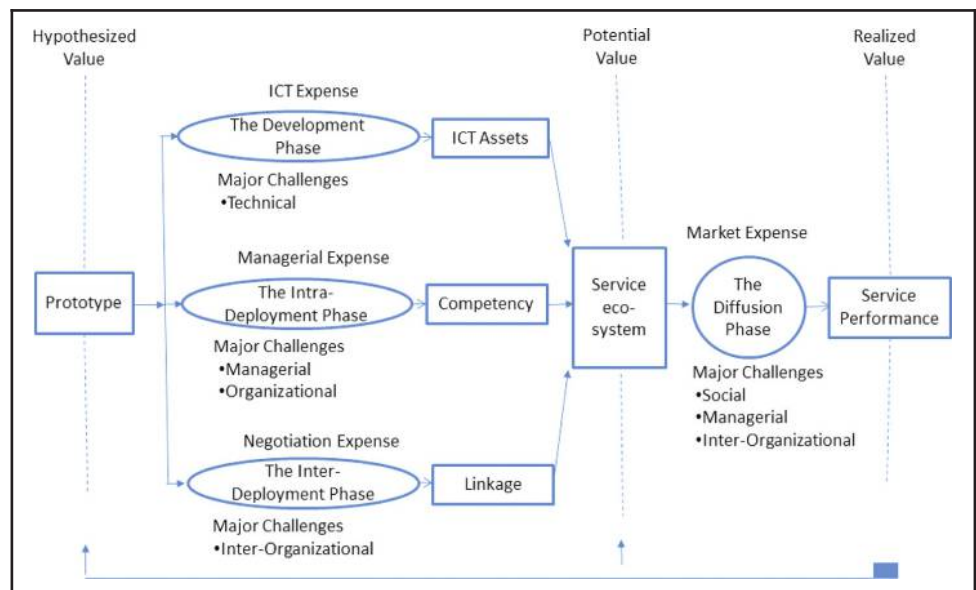
Finally, students may think about subjective factors, such as employee commitment and leadership issues, which must be dealt with when the NPM implements service innovations.

Issue 5: What are the issues and challenges faced when the NPM carries out service innovations in ICT-enabled services?

The statements from the challenges subsection of the case can be summarized in [Figure 5](#). The figures illustrate four phases, namely, Development, Intra-Development, Inter-Deployment and Diffusion, as well as the issues and challenges that may be encountered within each phase:

1. *Development phase:* The organization should spend its ICT expenses to acquire the required ICT assets based on the needs of its service initiatives. Technical issues (such as ICT and digital content) are the major challenges in this phase.
2. *Intra-development phase:* The organization should spend management expenses to develop the required organization competency based on the needs of the service initiative. Management and organization issues (such as the creative application of ICT systems, innovative business modeling, innovative multidiscipline integration, cultural and artistic innovations, service and management innovations and so on) are the major challenges in this phase.

Figure 5 Challenges encountered within the innovation process of new ICT-enabled service



3. *Inter-development phase*: The organization should spend negotiation expenses to build up its links with relevant business partners to fulfill the service ecosystem based upon the needs of its service initiatives. The issues of inter-organization collaboration (such as collaborative commerce) are the major challenges in this phase.
4. *Diffusion phase*: The organization should spend marketing expenses to launch the new service fully. Social issues (such as customer acceptance, regulations and economics), management issues and interorganizational issues are the major challenges in this phase.

Issue 6: What kind of values can the NPM expect to encounter within the context of service innovation?

As shown in [Figure 5](#), the NPM's value expectations may be different regarding the three products.

1. regarding the prototype, the NPM has a hypothesized value;
2. based on the integration of ICT assets, the competency and the linkages, the NPM has a potential value regarding the new service ecosystem; and
3. when new services are fully launched, the NPM has the realized value regarding the new service.

Each of the hypothesized, the potential and the realized values are evaluated regarding their human and social influences as well as their historical heritage and the creativity of cultural assets:

1. The human and social influences:
 - social influence (such as improving the cultural sophistication of the public and familiarizing the public with Chinese cultural artifacts);
 - national influence (such as the way in which Taiwan shifts the gravity of economic development towards the appreciation of cultural assets and further for people's use and appreciation in their daily lives); and
 - economic influence (such as the cultural and creative industries becoming one of the pillars of the national competitive force).
2. The historical heritage and creativity of cultural assets:
 - transformation of social values and historical heritage; and
 - increasing the coverage of the NPM's services and providing the public with cultural and artistic inspirations to improve their creativity further.

Issue 7: If you were a consultant to the director of the NPM, what would be your suggestions for infusing life into the NPM's collection of ancient artifacts and texts in a sustainable and effective manner?

This question helps students make full use of their creativity. The following answers from the NPM are for instructors' reference only. In recent years, many cultural institutions have suffered budget cuts by governments and, thus, have faced the pressures of trying to survive. To be sustainable in the marketplace, these institutions began to focus on their management and tried innovating actively to generate new capabilities and competitive advantages (Howkins, 2005; Bilton, 2007). Course investigations can be considered in two major categories, namely, ICT and non-ICT innovations.

1. ICT innovations:
 - The teaching case clearly shows that the driving force of innovative ICT services is dependent on the collaboration between different functional departments inside and outside the museum. To sustain such innovations, we recommend the NPM to establish an internal innovation scheme. Various departments in the organization can brainstorm and propose service innovations, and rewards can be provided by the NPM to individuals or departments that came up with good proposals.
 - *Establishing academic and corporate partnerships*: The NPM is committed to transforming its traditional object-oriented focus and generating an active and youthful image. To attract young people, the NPM can collaborate with colleges and universities and engage young students majoring in ICT-relevant subjects to develop innovative products such as apps or games. Products created by these young developers would naturally be preferred by younger customers. In addition

to helping the NPM to attract a younger visitor base, this proposal would also provide opportunities for students to realize their creative ideas and become involved in the cultural and creative industries.

- *Developing multimedia educational resources:* Education has always been one of the most important functions of the museum, and the collection of cultural artifacts at the NPM provides the most comprehensive representation of Chinese history and culture. Most of the current exhibits and educational activities in the NPM are passive. The development of interactive and enticing educational resources should result in improved learning effectiveness for students and researchers of every age group. The NPM may develop multimedia educational resources for different target groups; in addition, these resources could provide teachers with supplementary materials that could be used during teaching. Multimedia resources can also be commercialized and sold in foreign markets so that more people will gain an interest in Chinese art.

2. Non-ICT innovations:

- *Collaboration with other industries:* The NPM can collaborate with local or international design firms (such as Alessi) so that the NPM collection can be presented via a diverse selection of channels in international markets and become part of people's daily lives. Additionally, the NPM can work with the film industries to include its images in film productions.
- *Authorization of digital images:* Digital images can be authorized and released for public use. The NPM can use such methods as a means of acquiring authorization fees and make its collection more accessible to the general public.
- *Creative merchandising for the souvenir shops:* The commercial success of the *Acknowledged* paper tape has convinced the NPM about the importance of developing creative merchandising and the economic opportunities these products can provide. Museum souvenirs not only provide memorabilia for visitors after their visit to the NPM but they can also play educational roles. The NPM can develop similar desirable museum merchandise. Ideas for product lines can be generated using research findings provided by market researchers or from materials developed via public involvement.
- *Digital tours:* The NPM in its current phase has mounted digital exhibits (such as those held in Huashan 1914 Creative Park and Songyan Creative Park in Taipei City), but the target audience of these events has mainly been people living in the metropolitan areas of Taipei. Despite being a publicly funded organization, the NPM provides few opportunities to access its newest ICT-enabled services to residents living in rural or remote areas. Hence, the NPM may consider using mobile vehicles and platforms carrying innovative and digital exhibits to the various regions of Taiwan. This innovative strategy may be the game changer required to overcome regional barriers and improve cultural appreciation in every corner of the country.

References

Bilton, C. (2007), *Management and Creativity: From Creative Industries to Creative Management*, Blackwell, Oxford.

Howkins, J. (2005), "The mayor's commission on the creative industries", in Hartley, J. (Ed), *Creative Industries*, Blackwell, Oxford, pp. 117-125.

Johnson, S.P., Menor, L.J., Roth, A.V. and Chase, R.B. (2000), "A critical evaluation of the new service development process", in Fitzsimmons, J.A. and Fitzsimmons, M.J. (Eds), *New Service Development*, Sage Publications, Thousand Oaks, CA.

Schumpeter, J.A. (1934), *The Theory of Economic Development*, Cambridge, MA.

Abstract

Title – *National Palace Museum and service innovations.*

Subject area – *Service innovation, ICT-enabled services, museum, cultural and creative industries.*

Study level/applicability – *Graduate-level courses of "Innovation Management," "Service Innovation," or "Cultural and Creative Industries".*

Case overview – *In 2006, the National Palace Museum (NPM) in Taipei, Taiwan, announced its new vision "Reviving the Charm of an Ancient Collection and Creating New values for Generations to Come". In recent years, the NPM has been shifting its operational focus from being object-oriented to being public-centered, and the museum has held not only the physical forms of artifacts and documents but also their digital images and metadata. These changes would inject new life into historical artifacts. In addition, archives as its collections would be given a refreshingly new image to the public and become connected with people's daily lives. Among these endeavors for displaying historical artifacts online and prevailing Chinese culture in the modern age, the key issues are related to digital technology applications and service innovations. The service innovations would be further divided into information and communication technologies (ICT)-enabled ones and non-ICT-enabled ones. These shifts clearly claim that adopting digital technologies and innovative services can bring positive impacts to the museum. The NPM administrative team wants to keep infusing life into ancient artifacts and texts, sustaining curiosities of the public for Chinese culture and history, and invoking their interests to visit the NPM in person. However, to develop for the future while reviewing the past, the NPM administrative team has to meditate on the next steps in terms of implementation of service innovations.*

Expected learning outcomes – *Students will learn motivations of digital establishment and service innovations from the organization perspective and the necessities of technological implementation. Students will understand the difference in innovations between ICT-enabled services and non-ICT-enabled services. Students would be able to understand the process of developing a new service. Students will be aware of challenges the organization would face in developing a new service.*

Supplementary materials – *Teaching Notes are available for educators only. Please contact your library to gain login details or email support@emeraldinsight.com to request teaching notes.*

Subject code – *CSS 10: Public Sector Management*