

## A SCHEME FOR “THE WINDOW OF TAIWAN NATIONAL PARK”

Eva Yi-fang Tang<sup>a</sup>,

<sup>a</sup> Construction and Planning Agency, Ministry of Interior, Taiwan – [evatang@cpami.gov.tw](mailto:evatang@cpami.gov.tw)

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### ABSTRACT:

There are nine distinguished national parks in Taiwan. Each one has its own wild variety of natural inhabitants and cultural resources. However, due to the geographical inaccessibility, partially closed by natural disaster, or under the restrict protection by the authority, most of the places are difficult to reach for the public, not to mention for the disabled people. Therefore, a scheme, with the cutting edge technology, comprising the essences of all nine national parks in a space located in one of the national parks which is more convenient with public transportation system is presented. The idea is to open a window in the hope to offer a platform for better and easy understanding the features of all national parks, to increase the accessibility for disabled people, and to provide advanced services for the public.

Recently, the progressing of digital image technology becomes more and more promising. Using mutual interactive ways and game-like formation to promote the participation of visitors to gain learning experiences is now becoming a mainstream for exhibition in visitor centers and museums around the world. The method of the motion-sensing interactive exhibition has personalized feature which is programmed to store visitor’s behaviors and become smarter in response with visitor in order to make each person feel that they are playing in a game. It involves scenarios, concepts and visitors’ participation in the exhibition design to form an interactive flow among human, exhibits, and space. It is highly attractive and low barrier for young, senior and disabled people, and for the case of no physical objects to exhibit, visual technology is a way of solution.

This paper presents the features and difficulties of national parks in Taiwan. Visitors’ behavior and several cases have been investigated and analysed to find a suitable way for combining all the features of national parks in an exhibition. However, it should be noticed that this is not an alternative way trying to create a place for the public to explore visual national parks instead of visiting real ones. The main purpose is not only to provide more information and attract more people to realize the beauty of national parks, but also to inspire visitors’ wishes to come and experience in person in the future.

### 1. INTRODUCTION

The aim of national parks is to maintain the unique natural resources, environments, historical sites, and biodiversity within the parks through effective operation and management. In addition to constantly monitor the status and changes in the environment, nation parks must also take actions to respond to threatening factors, and evaluate the effectiveness of operation and management. In Taiwan, there are nine distinguished national parks, taking around 8.66% of total lands. Each one has its own wild variety of natural inhabitants and cultural resources. However, due to geographical inaccessibility, partially closed by natural disaster, or under the restrict protection by the authority, most of the places are difficult to reach for the public, not to mention for the disabled people. Although people might have the right to know all the resources of national parks, the development for human utilization is definitely a secondary priority. Therefore, a scheme with the cutting edge technology to comprise the essences of nine national parks in a space located in the national park which is convenient for visitors with public transportation system is presented. The idea is to open a window of national park in the hope to offer a platform for better understanding and exploring the features of all national parks. It could also increase the accessibility for disabled people, and provide advanced services for the public.

### 2. THE RESOURCES AND INACCESSIBLE FACTORS OF NATIONAL PARKS IN TAIWAN

The first national park in Taiwan is Kenting. It was established in 1984 when Taiwan’s rapid economic and industrial growth had put heavy pressure on the authority over natural environments. Till date, there are nine national parks been designated to ensure protection for both natural and cultural resources. Figure 1 shows the location of the nine national parks around Taiwan area. They are simply categorized in 5 types, including mountain, seafloor, off-shore island, wetland, and special geology. The resources and inaccessible factors are listed in Table 1.



Figure 1. The distribution of nine national parks in Taiwan

Name	Established	Resource	Inaccessible Factor
Kenting	Jan. 1, 1984	<ul style="list-style-type: none"> <li>• Coral reef</li> <li>• Tropical shrubbery</li> </ul>	<ul style="list-style-type: none"> <li>• Locate at southern tip of Taiwan</li> </ul>
Yushan	April 10, 1985	<ul style="list-style-type: none"> <li>• High mountain and deep valley, including river erosion, cliff, gravel hillside</li> <li>• highest mountain Yushan, 3,952 meters</li> </ul>	<ul style="list-style-type: none"> <li>• High above sea level</li> <li>• Inconvenient for accommodation and transportation</li> <li>• Frequently closed by natural disaster</li> </ul>
Yang-mingshan	Sep. 16, 1985	<ul style="list-style-type: none"> <li>• Volcanic geology</li> </ul>	<ul style="list-style-type: none"> <li>• High variety of snakes, insects, and wild animals in ecology conservation area and unstable climate.</li> </ul>
Taroko	Nov. 28, 1986	<ul style="list-style-type: none"> <li>• Mountain, cliff, and valley</li> </ul>	<ul style="list-style-type: none"> <li>• Rugged terrain</li> <li>• Inconvenient for accommodation and transportation</li> </ul>
Sheipa	July 1, 1992	<ul style="list-style-type: none"> <li>• With several mountains above 3000 meters.</li> </ul>	<ul style="list-style-type: none"> <li>• High above sea level</li> <li>• Inconvenient for accommodation and transportation</li> <li>• Frequently closed by natural disaster</li> </ul>
Kinmen	Oct. 18, 1995	<ul style="list-style-type: none"> <li>• Maokong rock</li> <li>• Fortress and military structures</li> </ul>	<ul style="list-style-type: none"> <li>• Off-shore island</li> <li>• High cost for accommodation and transportation</li> <li>• Secluded military facility</li> </ul>
Dongsha	Oct. 4, 2007	<ul style="list-style-type: none"> <li>• a wide range of fish and reef communities</li> </ul>	<ul style="list-style-type: none"> <li>• Off-shore island</li> <li>• Military restricted area not opened for public</li> </ul>
Taijiang	Dec. 28, 2009	<ul style="list-style-type: none"> <li>• Wetlands and lagoons, salterns, fish farms, and vintage villages.</li> <li>• Conservation areas for mangroves and black-faced spoonbills.</li> </ul>	<ul style="list-style-type: none"> <li>• Restricted in conservation area</li> </ul>
South Penghu	June 8, 2014	<ul style="list-style-type: none"> <li>• Basalt geology</li> <li>• Coral reef</li> </ul>	<ul style="list-style-type: none"> <li>• Off-shore island</li> <li>• Inconvenient for transportation</li> </ul>

Table 1. Resources and inaccessible factors of nine national parks in Taiwan

For visitors, it can be seen from Table 1 that only Yangmingshan and Kenting national parks are easy to reach. The other 7 national parks are inconvenient in transportation or full of challenges for children, senior, disabled people and those who are accustomed to urban lives. This is the main reason that the majority of the population in Taiwan have not yet paid a visit to these national parks. (Gau, 2008:67)

### 3. WHY SHOULD NATIONAL PARKS DO SO?

#### 3.1 Weaknesses and Threats

Based on years of research and experience analysis conducted by the national parks headquarters, the internal weaknesses and threats of tourist services are listed as follows:

- 1) Visitor centers are far from major city and public transportation is not convenient. Therefore, most of the visitors have to drive for themselves. (Wu, 2001)
- 2) Partial area in each national park is protected zones and restricted for civilians to enter. There are some sections which can't be reach by vehicles or need special equipments.
- 3) Most of the places in national parks are sparsely populated and out of reach. However, there are still a few scenic areas suffered from too much human activity, such as Taroko Gorge and South Bay of Kenting. These are heavily criticized by conservationists.
- 4) The exhibition and published issues are ecology and science oriented. This is very different from visitors' interest which is only for leisure. (Song, 2006: 132)
- 5) Most of the demonstrations are static or in written forms, not renewed very often, lack of amusement, and without interaction with visitors. (Hsu and Chen, 2004: 117)

The external factor is that the number of disabled people, children under age 14, and senior people over age 65 are around 28.86% of the population in Taiwan.<sup>1</sup> These people might have difficulties in enjoying the real beauty of the national parks. A severer condition is that the aging problem here has become worse than ever. If the barriers for visiting do not reduce to a certain level, they might lose interest in coming, or in other words, be blocked from national parks.

Based on the experiences of staff and visitor's behavior researches for national parks, the majority coming to visitor centers are family for leisure activities. Due to physical and mental differences, the needs for tour guide, perspective, and main focus for senior and young members should be varied. However, most families cut the tour in visitor centers to cope with the young members because they are less concentrated, which means that most families are taking a drive-through tour to visit national parks. Moreover, for disabled and senior people, the accessibility is the first common requirement for all facilities in national parks. (Ho et al, 2011) The major concern for these people is the problems regarding physical inconvenient, insufficient sport activity, and less concentration. Therefore, if a demonstration with accessible location and

<sup>1</sup> Statistics by Ministry of the Interior, R.O.C. in May 2015 and Ministry of Health and Welfare, R.O.C. in June 2015

interesting scenario, it would be helpful for them in mental development and physical coordination training.

### 3.2 Strengths and Opportunities

Visitors might be less interested and impatient to static demonstration, however, according to the results of years questionnaire and academic research, there are 90% satisfaction on narrating services and education activities offered by national parks. Also, most of visitors have strong will to re-visit. (Hung 2002, Wu 2003, Yang 2011, Yueng 2014) It reveals that the major strength of the national parks is plenty of resources can be used as topics for demonstration and education purposes.

Recently, the progressing of the digital image technology becomes more and more promising. Using mutual interactive ways and game-like formation to promote the participation of visitors for gaining learning experiences is now becoming a mainstream for exhibition in visitor centers and museums around the world. These technologies have the potential to support visitors' meaning making by framing and focusing their activities and interactions (with objects and other people). And these same technologies enable easy and automatic linking to virtual communities outside the building and after the visit. (Tallon and Walker, 2008: 121) The method of the motion-sensitive interactive exhibition has personalized feature which is programmed to store user's behaviors and become smarter in response with visitors in order to make each person feel that they are playing in a game. It involves scenarios, concepts and visitors' participants in the exhibition design to form an interactive flow among human, exhibits, and space. It is highly attractive and low barrier for young, senior and disabled people, and for the case of no physical objects to exhibit, visual technology is a way of solution.

Therefore, an idea of the exhibition using digital image technology located in a national park with convenient transportation is presented.

## 4. AN EXHIBITION WITH ACCESSIBILITY AND INTEREST

"The Window of Taiwan National Park" exhibition contains one theater, three topics of interactive exhibition, and one outdoor tour. The location of this exhibition is at Yangmingshan National Park because it is in the Taipei-Keelung Metropolitan Area with convenient bus transportation and MRT system. Also, the facility for disabled people is well prepared compared to the other national parks.

### 4.1 National Parks of Taiwan 360°

First, visitors will be directed to a theater to preview a panorama of national parks. The 15-minute spectacular and immersive journey introduces mountains, forests, wetlands, oceans, and wild lives in national parks. The film is a 360° format featuring a seamless surrounding image. These projected images are adjusted to each other automatically and produces a smooth and united picture. Nine projectors have been used to cast images on a cylindrical screen with a circumference of 52 meters and 3.5 meters in height. The viewing platform is 10 meters in diameter and could hold up to 70 viewers. Surrounded by 360 degree panorama video, the viewers might not only be shocked by the contents of dynamic

images, but also deeply immerse themselves in the combination of audio and background sound.

### 4.2 Motion-sensing Interactive Exhibition

The display is using interactive game for education purpose. It applies Microsoft Kinect, a line of motion-sensing input devices, for visitors to control and interact with computers without the need for a game controller, through a natural user interface using gestures. There are several Kinect interactive games applied in educational and medical auxiliary tools including kinesiology, physical training for cerebral palsy patients, disabled people, and coordinated training for senior people. (Lange 2011, Chang 2013, ChangChine 2014, Miller 2014) With this, the exhibition could become an exergame, with game and exercise. Exergame relies on technology that tracks body movement or reaction and makes video games more fun. There are three topics of motion-sensing interactive exhibition listed below.

#### 4.2.1 Dive Against Debris

Located at Taiwan's tropical southernmost tip, Kenting National Park covers 33,290 hectares with a dramatic coastline formed by millions of years of geologic activity. In the marine area of the park, the Kuroshio Current<sup>2</sup> runs across and keeps the annual water temperature at 22–29 °C. It features fossilized coral cliffs, living coral reefs and diverse marine lives, therefore, it attracts millions of both domestic and foreign tourists every year. However, people made tons of waste and contaminated the ocean along the coastline. Plenty plastic waste might be eaten by marine animals. Discarded fish nets might strangle coral reefs and affect their growth. And too many divers have damaged the ecology of coral reefs; hence Kenting National Park has already banned these activities. This game models divers working as environmental volunteers to help to clean the waste on sea floor (Figure 2) and also enjoy the beauty of tropical ocean. The players work at 10-15 meters below sea level to observe the ecology of coral reefs, and also clean plastic waste and remove abandoned fish net. During the work, the players might meet with all kind of wild sea lives such as fish, seaweed, sea anemone, coelenterate, echinoderm, crustacean, and coral reef. The only restriction for players is to be careful not to make foot on them or scare them off.



Figure 2. Diving and cleaning waste in Kenting National Park

#### 4.2.2 Conquer Taroko Gorge

The scenario is at Taroko Gorge (Figure 3), a spectacular 19-kilometer marble canyon that was lifted up from the earth by tectonic movement and carved out by the Liwu River. A crested goshawk<sup>3</sup> flies through the valley to enjoy the view, vegetation, and geology at different altitudes, sharp differences from one meter to 3,740 meters above sea level. As the altitude rises, the vegetation changes from broad-leaved forest, through mixed and coniferous forest, to alpine forest. These provide different habitats for a wide variety of animal and bird life, including a number of rare species native to Taiwan, such as the Formosan Rock Monkey, the Formosan Pangolin, and the Black Bear. Along the gorge, there is a 2-kilometer section with narrow distances between two sides of the gorge and is difficult to operate for players during high speed. The game is also designed to monitor the motion of players' arms and create a virtual environment for players to have flying experience especially for disabled people.

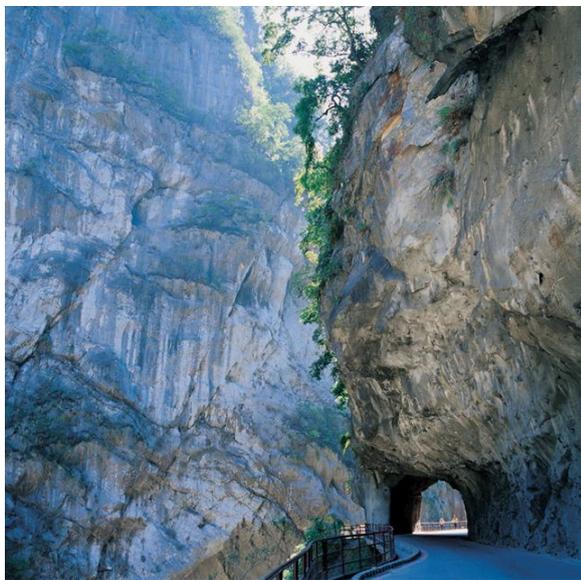


Figure 3. Taroko Gorge

#### 4.2.3 Guardian of Point W16

The Point W16 is located at North Cliff of Gunningtou in Kinmen, an island which is geographically near Xiamen, Mainland China, no more than 2 kilometres (Figure 4). It was a battle field, Battle of Gunningtou, in 1949, and was restricted to civilians by military since then. The authority has been transferred to Kinmen National Park and is now open to the public.

The scenario of the game is soldiers guarding at Point W16 during cold war in 1970's. Although this period is peaceful than 1950-60's, People's Republic of China persistently maintained the strategy "shelling on odd-numbered days, no shelling on even days (單打雙不打)" from 1958 to 1978 and caused considerable casualties and destruction. Approximately 100,000 soldiers guarded the front lines in Kinmen at the time.

<sup>2</sup> A north-flowing ocean current on the west side of the North Pacific Ocean.

<sup>3</sup> The crested goshawk is a bird of prey and fairly common in forested mountainous areas of central and eastern Taiwan.

In this game, the soldiers' task is to secure all the surrounding area and watch out enemies. As they walking down the path, there are military facilities, tunnels, and all kinds of terrains in North Cliff of Gunningtou, including Maokong rock<sup>4</sup>, bushes with thorns, and rail obstacles along beach. They have to pay much attention on the enemies coming from the sea, prevent themselves from being trapped in any place, and avoid landmine zones.



Figure 4. The Point W16 in Kinmen National Park

#### 4.3 A Place in Nature for Everyone

If visitors are not exhausted, it is recommended that they could be as close to the nature as possible. The exhibition is planned to be at Yangmingshan National Park, which is located on the northern edge of Taipei City and is easily accessible. The park is famous for its hot springs, which are heated by long-dormant volcanoes. In order to let visitors have the opportunity to enjoy natural environment, the headquarter of Yangmingshan National Park set the Erziping Trail (Figure 5), 1.8 km along the volcano valley between Datun peak and Erzi mountain. The distance from the headquarter visitor center to Erziping is 2 km, and visitors could reach by shuttle bus. The path from the Erziping visitor center to the ecological pond is an accessible trail with smooth, paved roads and a 3-meter wide forest path, perfect condition for all seasons. The trail provides quality outdoor recreations for all ages and beautiful views of mountains. It is also good to watch butterflies, birds, plants, and seasonal changes of landscape.



Figure 5. The Erziping Trail in Yangmingshan National Park

<sup>4</sup> One kind of basalt, reddish-brown, with many holes.

The interactive games in the exhibition are very educational for children and teenagers. There are also possibilities that they could inspire senior and disabled people to participate more physical exercises and social activities. However, it should be noticed that this is not an alternative way trying to create a visual national park for the public instead of visiting real ones. The main purpose is not only to provide more information and attract more people to realize the beauty of national parks, but also to inspire visitor's interest to participate and experience in person in the future.

## 5. CONCLUSION

The richness of the cultural and natural resources of national parks is valuable and essential for the public to extend knowledge, learn wild lives, and enjoy leisure time. It is also the place and the opportunity for disabled people to explore the world with ease and make connection to the society. In the argument of the social and public welfare, national parks must provide selfless services, and gain appreciation by the public. Also, it must accept and respect every person who wishes to pay the visit. Fortunately, the digital image technology has created many possibilities in demonstration contents and measures, and we should take advantage of it in order to pass the concept of environmental protection to the public. In the mean time, it could also reduce the loading of some hot spots to a certain level and decrease the impacts to the environment, and, as a result, bring the marvel, uniqueness and beauty of national parks to more people.

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