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Conservation of CULTURAL HERITAGE







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A Study on the Topic Discovery to produce Tangible and Intangible Virtual Content of the Joseon Tongsinsa

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Abstract

The "Documents on Joseon Tongsinsa," a symbol of peace exchange between Joseon and Japan, was jointly registered in Memory of the world, UNESCO, in October 2017.

As a result of investigating the precedent research of the Joseon Tongsinsa and the list of Memory of the world, UNESCO, the Joseon Tongsinsa has various good materials to be produced as 3D tangible and intangible virtual contents.

Interesting visual elements such as equestrian feats, archery, errand boy, costume and ship of Joseon Tongsinsa, landscapes, and several records contained in the literature records can be used as interesting story materials.

This can maximize visual effects and convey various historical stories in an interesting and convenient way.

It is of pride to Koreans to publicize and rejoice in the historical facts about cultural exchanges of the Joseon Tongsinsa, which have remained only in academic research, through 3D content.

It would play important role in Joseon research history, if it is ascertained through historical research, participants of the missions and various objects can be visualized based on the precedent research on the Joseon Tongsinsa.

Currently, Korean culture is receiving attention from across the world under the name of "K-content."

The Joseon Tongsinsa must deliver interesting story that Joseon, similar to the current Hallyu, was another Hallyu in past in Northeast Asia.

In addition, it should be produced in 3D tangible and intangible virtual content with new technologies to promote Confucianism-Hallyu, the leading culture of Northeast Asia in the past Joseon, to the Korean and the world.

The Joseon Tongsinsa is an opportunity to re-examine and highlight its status as a cultural advanced country that led the Confucian culture of Northeast Asia in 18th century on the Korean Peninsula through various approaches, along with its current research achievements.

I. Introduction

1. Necessity and purpose of the study

The Joseon Tongsinsa was a diplomatic mission and cultural mission sent by the king of the Joseon Dynasty to Japan's Bakufu Shogun, who was dispatched 12 times from 1607 to 1811 after the Japanese Invasion of Korea in 1592.

As an advanced cultural mission, the Joseon Tongsinsa group played an important role in showing the excellence of Joseon culture to Japan's Bakufu and their people.

The "Documents on Joseon Tongsinsa," a symbol of peace exchange between Joseon and Japan, was jointly registered in Memory of the world, UNESCO, in October 2017.

The 111 articles (333 items) of Joseon Tongsinsa of both Korea and Japan are divided into diplomatic, travel, and cultural exchange records. Further, the travel records include Joseon Tongsinsa's processional and documentary paintings of Joseon and Japan.

In relation to the Joseon Tongsinsa, various studies have been conducted on the history of Korea-Japan relations, travel records, processional and documentary paintings, and cultural exchanges.

Even with the 5G communication platform environment being built and transitioned to digital content, the Joseon Tongsinsa records, which has been historically researched, is yet to be produced.

Through the Joseon Tongsinsa records, various cultures such as rituals, clothing, relics, and art in the late Joseon Dynasty can be examined. There are sufficient literature and conversation materials that can elaborate upon the diverse contents of the Joseon Tongsinsa. Moreover, various cultural aspects, specificity, and importance of the Joseon Tongsinsa can be utilized in education.

This study aims to explore relevant topics and stories from numerous records and examples of Joseon Tongsinsa for producing digital content and using them as educational material.

2. Scope and method of the study

Literature material such as historical, liturgical, and diplomatic records, painting materials such as processional, documentary, and appreciative paintings, traveling records, and precedent studies were collected. The result of the study is derived by integrally analyzing the collected materials.

The result of the study is derived by integrally undryzing the conceled materials.

II. Overview and Reproduction Trends of the Joseon Tongsinsa

1. Outline of the Joseon Tongsinsa

1) Year and purpose of dispatch of the Joseon Tongsinsa

After the end of the Japanese Invasion of Korea in 1592, the missions dispatched in 1607 (the 40th year of King Seonjo's reign), 1617 (the 9th year of King Gwanghaegun's reign), and 1624 (the 2nd year of King Injo's reign) were not called "Tongsinsa," but "envoys for repatriation."

No.	Year	Purpose	Meaning and name of the diplomatic mission							
1	1607 (Seonjo 40)		_							
2	1617 (Gwanghae 9)	Reinforce negotiations to terminate the state of war and repatriate prisoners taken during the war	Envoys for repatriation							
3	1624 (Injo 2)	war and reputilate prisoners taken adming the war	ion reputitution							
4	1636 (Injo 14)	Building a friendly relationship								
5	1643 (Injo 21)	Trade negotiation and exploring national affairs								
6	1655 (Hyojong 6)	Exploring national affairs								
7	1682 (Sukjong 8)	Trade negotiation								
8	1711 (Sukjong 37)		Tongsinsa							
9	1719 (Sukjong 45)	Confirmation of Polationship								
10	1748 (Yeongjo 24)	Commation of Relationship								
11	1763 (Yeongjo 39)									
12	1811 (sunjo 11)	Exchanging official letters of the king in Thushima								

<Table 1> summarizes the year and purpose of dispatch of the Joseon Tongsinsa in the late Joseon Dynasty.

This was because in Joseon, which suffered from the Japanese Invasion of Korea in 1592, Tokugawa Bakufu was not recognized as a country that could communicate in good faith.

It was from 1636 (the 14th year of King Injo's reign) that the "Tongsinsa," which means communicating with faith, was used again in the diplomatic mission.

Due to the collapse of the Chinese world order system following the change of power between the Ming and Qing Dynasties in China, both Joseon and Japan needed to establish a new sense of solidarity and friendship.

This has diplomatic significance in establishing independent and equal diplomatic relations between Joseon and Japan, excluding the Qing Dynasty.

From 6th mission in 1655 to 9th mission in 1719, Joseon was in cultural dominance and non-interactively initiated the products of civilization to Japan.

On 11th mission in 1763, Japanese Confucianism and Chinese Literature developed greatly, reaching the level of academic debate with Joseon.

Joseon's Confucianism remained in Neo-Confucianism of Song Dynasty whereas Japan accepted philosophy of Wang Yangming of Ming Dynasty and Western studies through Dutch.

Therefore, Japan recognized that Joseon's culture was no longer an advanced culture, and the Joseon Tongsinsa also began to focus on exploring Japan with intellectual interests, breaking away from its previous disregard for Japan.

Through this process, Japan no longer felt the need to invite Joseon Tongsinsa at a huge cost.

In 1811, the 12th dispatch of the Joseon Tongsinsa terminated after the formal exchange of the official letter written by king in Tsusima. Regrettably, Joseon, a culturally advanced country, failed to maintain its status as an advanced country due to its closed-mindedness and disconnect from reality.

2) Size and role of the member of the Joseon Tongsinsa

(1) Delivery of the official letter written by the king

In the late Joseon Dynasty, 450 to 500 members of the Joseon Tongsinsa were dispatched to Japan.

In Japan, the members were classified into *Samsa, Sangsang-gwan, Sang-gwan, Chagwan, Joong-gwan,* and *Hagwan* according to their status and received discriminative hospitality.

<Table 2> summarizes the status and roles of each member of the Joseon Tongsinsa.

The most important role of the members of the Joseon Tongsinsa as the diplomatic delegation was to deliver the official letter written by the king and gifts of the Joseon Dynasty to the Japanese shogunate and to receive a letter of reply from the shogun.

Classification	Statuc	Role	
Classification	Status	Official	Cultural exchange
	Jeongsa	General director	-
Samsa	Busa	Vice director	-
	Jongsagwan	Record and report the mission	-
Congconggwon	Dangsangyeokgwan	Supreme interpreter	-
Sangsanggwan	Interpreter	Interpreter under 3rd grade officers	-
	Poem exchanger	Outstanding literary ability	Communicating in Chinese
	Scribe	Record	poem
	Clerk	Person who is good at calligraphy	Calligraphy
	Chasangtongsa	Interpreter for trade	-
	Abmoolgwan	Interpreter for trade	-
Sang-gwan	Skillful physician	Physician in charge	Medical science
	Principal physician	Principal physician	-
	Painter	Depict Japanese landscape, map, etc.	Painting
	Military officer	Escort and military command	-
	Jaje goongwan	Samsa's son or relatives	-
	Equestrian feats	Equestrian feats performers	Perform equestrian feats
	Jeonak	Conduct the band	Play music
Chagwan	lema	Take care of horses	-
	Bandang	Sashin's retinue	-
	Seonjang	Director of Giseon	-
	Bokseonjang	Director of Bokseon	-
	Sotongsa	Junior interpreter	Perform song and dance
Joong-gwan	Band	Play music	Play music
	Gisoo	Lift various flags	-
	Errand boy	Errand, sing, dance	-
Hagwan	Gyeokgoon	row boat, chores	-

<Table 2> The members of the Tongsinsa and their role and status

(2) Cultural exchange

From 7th mission in 1682, the importance of cultural exchange emphasized the purpose of dispatching the Joseon Tongsinsa.

In the same year, the position of the poem exchanger, who oversaw communicating in Chinese poem, was raised.

Moreover, according to Japan's request, Joseon dispatched skillful physician for exchanging medical questions and answers, in addition to principal physician of the member of the Joseon Tongsinsa.

Communication using Chinese characters and poems was carried out by poem exchanger and three scribes-*samunsa*(四文士), thus, a total of four writers.

More than 90% of samunsa were concubines' sons and suffered social discrimination. However, they belonged to superior officer since their status was high among members.

From 1682, the appointments of the poem exchanger and scribe, in addition to samsa, were changed and they now required the king's permission.

The poem exchanger always attended when the missions left Hanyang and bid farewell to the king.

This shows the extent to which cultural exchange was emphasized in the Joseon Dynasty.

Furthermore, the communication using Chinese character on various subjects and poem was the core of the cultural exchange among the members of the mission.

Many Japanese visited the accommodation of the Tongsinsa during the journey from Tsushima Domain to Edo through Osaka until late night, and the intellectuals faced great hard work.

3) Itinerary of the Joseon Tongsinsa

The itinerary of the Joseon Tongsinsa comprised long and difficult journey of over 5 to 10 months Figure 1. shows the Joseon Tongsinsa's journey.

Departed through Gyeongsangjwado(慶尙左道) and arrived through Gyeongsangwoodo(慶尙右道), to reduce economic burden on counties and prefectures where the members of the mission stayed.

Moogeuk(無極) · Moongyeong(聞慶) and Yoogok(幽谷) were stopovers of departure and arrival because of their geographical location.

Official banquets were hosted by provincial governor in *Chungju, Andong, Gyeongju, Dongnae*, until 1655. Since 1719, banquets have been held only in Yeongcheon(永川) and Busan, due to economic burden.

Yeongcheon was a cross route connecting east, west, north, and south, so it was an intermediate place where all members of the mission gathered.

The Journey	Route	How to move
Busan ⇒Tsushima	Sea route	Tongringa Voscol
Tsushima \Rightarrow Osaka	Sea route	iongsinsa vessei
Osaka ⇒ Kyoto	River route	Japanese-provided ferry
$Kyoto \Rightarrow Edo$	Land route	palanquin, sedan chair, horse

<Table 3> summarizes the journey and route.



Figure 1. Itinerary of the Joseon Tongsinsa from Hanyang to Edo Song ji won, 2011, Korean Dipolomatic Missions to Japan: Aspects of Cultural Interchange between Korea and Japan, Korean Journal of Japanese Studies 5, pp.198-199

From Busan to Osaka via Tsushima, they traveled by sea on the Joseon Tongsinsa Vessel, and the vessel anchored at Osaka Port. Then, they traveled from Osaka to Kyoto by the river on a Japan-provided ferry. They traveled by land from Kyoto to Edo.

The shortest journey was the 12th(Soonjo 1811) to Tsushima, and the longest was the 4th in 1636(Injo 14), 5th in 1643(Injo 21), and 6th in 1655(Hyojong 6)to Nikko. The 1st mission was to Kyoto, and the other seven missions were to Edo.

4) Different perspective between two countries on the dispatch of the Joseon Tongsinsa

The two countries, Joseon and Japan, have different perspective on the dispatch of the Joseon Tongsinsa, which are as follows:

The perspective of Joseon

Joseon, as an advanced country in Confucian culture, had a justification for leading Japan's civilization through cultural guidance and purifying its aggression.

Three ambassadors with excellent academic ability were selected.

Physicians, clerks, painters, bandsmen, and acrobats who oversaw cultural exchanges were dispatched among people with excellent talents and skills in various fields.

Joseon paid immense attention to the costumes of the Tongsinsa because they wanted to flaunt their superiority as a cultural country and enlighten Japan by revealing that the costumes of the Tongsinsa had embraced the system of Sinocentrism.

Therefore, the uniform of the *Jeongsa* and *Busa* was provided by *Sanguiwon*(尙衣院), and the *Jongsagwan*'s uniform was provided by *Hojo*(戶曹)

Gongjo, Jeyong-gam or belonging government office provided materials or expenses for the clothes of *Wonyeok* and *Hwaja*.

Member of the missions, such as bandsmen or seamen who were selected from the provinces were ordered by their government offices to be sent with clothes.

Japanese shogunate also thought that the members of the mission in gorgeous dresses would help in strengthening stature, thus the apparels of Tongsinsa must be lavish.

The perspective of Japan

Japan emphasized the role of the missions of paying tribute by highlighting the official letter from the king and various gifts in the procession of the Joseon Tongsinsa, for establishing the legitimacy and authority of the shogunate regime.

To accommodate the advanced Confucian culture as a way of reinforcing the lack of literature in the Samurai regime, Japan even requested dispatch of the Joseon Tongsinsa by paying a huge amount of 50 billion yen for the entertainment of the mission members.

Since the pictures of the Tongsinsa procession were depicted by the painters to record the achievements of the regime, all but one of the existing pictures of procession was drawn by Japanese painters. The letters, paintings, and musical instruments received from retinue of the missions have been handed down to date.

2. Trends in the Joseon Tongsinsa studies and reenactment

1) Trends in the Joseon Tongsinsa studies

Domestic academic trends can be classified into history, art, culture, and others.

Studies have been conducted on the history of Korea-Japan relations on rituals, diplomacy, and cultural exchanges through the correspondence of the Joseon Tongsinsa, and the influence of Joseon Tongsinsa in East Asian political relations.

In the field of the history of art, there are studies on the feature of pictures of procession of the missions, the documentary paintings of Japan and the members of the mission in Japan through a long journey, and on the appreciative paintings of Joseon painter's landscape, flower and bird, and Seonhwa(禪畵).

In cultural history, there are studies on exchange patterns of communication in Chinese character and poem and publications in literary works, music, and dance transmitted to the Japanese through the Joseon Tongsinsa, on Japanese life and folklore, on medical exchanges between Joseon and Japan, and on the background of royal court of the Joseon dynasty's support and characteristics of costumes.

In addition, research on vessels, sea route journeys, and marine accidents that the Joseon Tongsinsa rode, and on the use of contents of Joseon Tongsinsa are actively being conducted.



Figure 2. 2018 Procession of the Tongsinsa in Busan, 2018 Joseon Tongsinsa History Museum



Figure 3. Joseon Tongsinsa 3D Animation Joseon Tongsinsa History Museum

2) Trends in reenactment

(1) Busan's Joseon Tongsinsa Cultural Projects

Today, the Joseon Tongsinsa of late Joseon dynasty is emerging as a representative of the friendship exchanges between Korea and Japan.

The countries are studing the Joseon Tongsinsa and reenacting the processions and rituals of the missions. A move to raise awareness of Joseon Tongsinsa.

From 1964, "Izuharaminatomatsuri(嚴原港祭り)" was held in Tsushima.

As the Joseon Tongsinsa Procession Promotion Association was launched in 1980 and the procession was reproduced, the festival was renamed "Izhara Minato Matsuriari-ri-Sai(嚴原港祭りアリラン祭)" from 1988.

Thereafter, since November 1995, Tsushima and other areas related to Joseon Tongsinsa have formed the "The Liaison Council of All Places Associated with Chosen Tsushinshi."

Since then, the Tongsinsa craze in Japan has hit Busan.

In March 2002, the "Reproduction Committee of the procession of Joseon Tongsinsa" began in Busan.

At the center of the committee, Joseon Tongsinsa reproduction project began in Busan, including reproducing the procession of the Tongsinsa to commemorate the 2002 FIFA Korea-Japan World Cup.

In September 2003, the members of the Tongsinsa restored the Yeonggadae building where the Haesinje was held.

In March 2005, the "Reproduction Committee of the procession of Joseon Tongsinsa" was reorganized into the "Cultural Project Association of Joseon Tongsinsa."

As the organization carried out businesses, including a procession of the Tongsinsa, the Joseon Tongsinsa festival became a representative festival in Busan.

In June 2006, "the Association of Joseon Tongsinsa" began in Busan.

In 2010, the "Cultural Project Association of Joseon Tongsinsa" was disbanded, and the Busan Cultural Foundation was made in charge of the "Joseon Tongsinsa Cultural Project," seeking a leap forward.

In 2011, "Joseon Tongsinsa History Museum" opened.





Official blog of cultural Heritage association htts://han. gl/qukKx



Figure 5. Jeongsagiseon restoration of National research institute of maritime cultural heritage, 2018

Official blog of cultural Heritage association htts://han.gl/HNIJj

In the exhibition hall of the Joseon Tongsinsa History Museum, "Joseon Tongsinsa 3D Animation" is being screened.

(2) National research institute of maritime cultural heritage

In June 2017, the national research institute of maritime cultural heritage implemented ambassador Jeongsa's ship-Jeongsagiseon in 3D screen, which is a symbol of Korea-Japan exchanges.

They rebuilt the vessel in real size according to this work in 2018 and held a launching ceremony on October 26, 2018, in Mokpo, Jeollanam-do.

The design of the *Jeongsagiseon* began in 2015 and was completed in 2018. The rebuilt ship is 34m long, 9.3m wide, and 3.0m high, with 22m high mast and a weight of 149 tons, and it can accommodate 72 people. For the ship building, 80 to 150 years old 900 Geumgangsong pine tree from Gangwondo were used.

III. Registration of Mow, UNESCO

The data of Korea are registered as a Memory of the World, UNESCO, on the digital archive, Joseon Tongsinsa History Museum website, and one can check the data of Japan on the Joseon Tongsinsa Liaison Council website.

1. Diplomatic documents

There are 3 articles (51 items) of official diplomatic documents from Joseon and Japan's national organizations.

There are 2 articles (32 items) of Korean diplomatic documents- Tongsinsadeungrok(通信使謄錄) 14 items,

No.	Title	Year	Produced by	Produced in	Number	Custodian	Document No.
1	Tongsinsadeungrok	-	Ministry of Culture and	1641-1811	14	SNU Kyujanggak	K.I-1
2	Byunryejipyo	-	Education(Yeajo)	1598-1841	18	Korean Studies	K.I-2

<Table 4> Diplomatic documents from Korea(2articles, 32items).



Figure 6. Tongsinsadeung-rok, Vol.3(K.I-1), SNU, Kyujanggak institute for Korean studies



Figure 7. By unryejipyo Vol.5(K.I-2), SNU, Kyujanggak institute for Korean studies

Byunryejipyo(邊例集要)-18items. The summary is shown in <Table 4>.

From 1641 (19th year of King Injo's reign) to 1811 (11th year of King Sunjo's reign), in Joseon, Jeongeksa(典客司), Yejo(禮曹) wrote official documents 「Tongsinsadeungrok」, related to missions and organized them categorically.

It is the most detailed record of practical operations such as procedures of various tasks related to the missions including economics aspects. It is meaningful as the primary historical material for diplomatic relations with Japan.

Byunryejipyo recorded diplomatic relations with Japan from 1598 (the 31st year of King Seonjo's reign) to 1841 (the 7th year of King Heonjong's reign).

The contents mainly contain information related to what happened between the two countries, including the visits of envoys, ships on envoys, trade, various regulations, treaties, and Waegwan (倭館)'s work.

After the Japanese Invasion of Korea in 1592, the details of the negotiations between Joseon and Japan were described and recorded separately, making it an important historical fact in the relationship with Japan in the late Joseon Dynasty.

2. Travel records

The travel records contain detailed records of the 4,500km round trip from Hanyang, the capital of Joseon, to Edo, and 65 articles(136 items). There are 38 articles(67 items) of Korean travel records, 32 articles of Sahangrok(使行錄), and 6 paintings. <Table 5> presents the summary.

Most of the travel records are Sahangrok (travel records of the missions), written by who had been dispatched



Figure 8. Busangrok(K.II-17), National Library of Korea



Figure 9. Dongsailgi(K.II-4), SNU, Kyujanggak institute for Korean studies

to the missions. Most title of the travel records include Chinese character "Sa(槎)" or "Sang(桑)." The "槎" means raft, and it means they traveled over the ocean to Japan. The "桑" originated from calling Japan as "Sang-guk(桑國)," and it means the travel records to Japan.

Dongsailgi(東槎日記)(K.II-4) is travel records of Park Jae(朴梓, 1564-1622), who participated to the dispatch as Busa.

He recorded the long journey from May 28, 1617, after bidding farewell to the king, to November 16, when he held a briefing session after return from Japan in the form of diary and poetry.

Busangrok(K.II-17) is the travel record of Kim Heub(金潝, Unknown). He recorded travel from April 11, 1719, after bidding farewell to the king, to September 27, arrival to Edo in the form of diary.

Lim Gwang (任続, 1579-1644) was Jeongsa of the mission, and Kim Seryeom (金世濂, 1593-1646) was Busa, and there were 475 members of the mission. It is possible to gauge the status of the Joseon Tongsinsa at that time with this painting. In the painting, members of the mission are riding



Figure 10. < The 14th year of King Injo's reign, Tongsinsaipganghodo> (K.II-34), 30.7x595cm, National Museum of Korea

<The 14th year of King Injo's reign, Tongsinsaipganghodo(仁祖14年通信使人江戶圖)> (K.II-34), is a picture of Tongsinsa procession entering Edo, Japan, in 1636.

No.	Title	Year of Embassy	Produced by	Produced in	Number	Custodian	Document No.
1	Gyeong Chilsong Haesarok	1607	Gyeong Seom	1607	1		K.II-1
2	O Chutan Dongsasangilgi	1617	O YunGeom	1617	1	National Library of	K.II-2
3	Lee Seokmun Busangrok	1617	Lee Gyongjik	1617	1	Rorea	K.II-3
4	Dongsailgi	1617	Park Jae	1617	1	SNU, Kyujanggak Institute for Korean studies	K.II-4
5	Gang Hongjung Dongsarok	1624	Gang Hongjung	1624	1		K.II-5
6	Im Champan Byeongjailbonilgi	1636	Im Gwang	1636	1		K.II-6
7	Kim Dongmyeong Haesarok	1636	Kim Coroom	1636	2		K.II-7
8	Kim Dongmyeong Sasangrok	1636	Kim Sereom	1636	1		K.II-8
9	Hwang Manrang Dongsarok	1636	Hwang Ho	1636	1		K.II-9
10	Jo Yongju Dongsarok Sin Jukdang Haesarok (First volume)	1643 1643	Jo Gyong Sin Yu	1643 1643	1		K.II-10
11	Sin Jukdang Haesarok (Second volume) Gyemidongsailgi	1643	Sin Yu Author unknown	1643	1	National Library of Korea	K.II-11
12	Nam Hogok Busangrok(two volumes)	1655	Nam Yongik	1655	2		K.II-12
13	Nam Hogok Mungyeonbyeolrok	1682		1682	1		K.II-13
14	Hong Yeoksa Dongsarok	1682	Hong Yujae	1682	1		K.II-14
15	Kim Yeoksa Dongsailrok	1719	Kim Jinam	1719	1		K.II-15
16	Sin Cheongcheon Haeyurok (Volumes 1-3)	1719	Sin Yuhan	1719	3		K.II-16
17	Busangrok	1747	Kim Heup	1747	2		K.II-17
18	Susailrok	1747	Hong Gyonghae	1747	2	SNU, Kyujanggak	K.II-18
19	Bongsailbonsimungyeonrok	1763-4	Jo Myeongchae	1763	2	studies	K.II-19
20	Jo Jegok Haesailrok (Volumes 1-5)	1763-4	Jo Eom	1763	5	National Library of Korea	K.II-20
21	llgwangi	1763-4		1763	4	National Institute of Korean History	K.II-21
22	llgwanchangsu	1763-4	Nam Ok	1763	2	National Library of	K.II-22
23	llgwansicho	1763-4		1763	2	Korea	K.II-23
24	llbonrok	1763-4	Seong Daejung	1763	2	Korea University	K.II-24
25	Seungsarok	1763-4	Won Junggeo	1763	5	Library	K.II-25
26	Sarok	1763-4	Min Hyesu	1763	1		K.II-26

<Table 5> Travel records of Korea(38articles, 67items)

No.	Title	Year of Embassy	Produced by	Produced in	Number	Custodian	Document No.
27	Myeongsarok	1763-4	O Daeryung	1763	1	National Library of	K.II-27
28	Gyemisusarok	1763-4	Byeon Tak	1763	1	Korea	K.II-28
29	lldongjangyuga	1763-4	Kim Ingyeom	1763	4	SNU, Kyujanggak Institute for Korean studies	K.II-29
30	Sinmitongsinilrok	1811	Kim Igyo	1811	3	Chungcheongnam-do History Museum	K.II-30
31	Cheongsandoyurok	1811	Kim Seonsin	1811	1	National Library of Korea	K.II-31
32	Dongsarok	1811	Yu Sangpil	1811	1	Korea University Library	K.II-32
33	Injo2nyeon Tongsinsa Hangryeoldo	1624	Author	1624	1	National Library of Korea	K.II-33
34	Injo14nyeon Tongsinsa Edoseongdo	1636	unknown	1636	1	National Museum of Korea	K.II-34
35	Sukjong37yeon Tongsinsa Hangryeoldo	1711	Dawara Gijaemon	1711	1711 4 National Institute of Korean History		K.II-35
36	Saroseunggudo	1748	Lee Seongrin	1748	1		K.II-36
37	Waegwando	1783	Byeon Bak	1783	1	National Museum of	K.II-37
38	Gukseonuseondo	unknown	Author unknown	unknown	1	Korea	K.II-38

horses, and 4 to 5 Japanese are escorting them. The Positions of the members are listed, and the honor guards and objects are also described in detail, which is an important data for grasping the size and role of the Joseon Tongsinsa of those days.

3. Cultural exchange records

The cultural exchange records include 41 articles (146 items) of actively conducted cultural exchanges



Figure 11. The handwriting(筆跡)(K.III-1) of Kim Seryeom(金世濂), 35x51.3cm, National Institute of Korenn History Records on Joseon Tongsinsa, p.198.

No.	Title	Year of Embassy	Produced by	Produced in	Number	Custodian	Document No.
1	Kim Seryeom deung Piljeok	1636	Kim Seryeom et al.	1636	1	National	K.III-1
2	Yu Chang Piljeok(poetry)	1655	Yu Chang	1655	1	Institute	K.III-2
3	Lee Myeongeon Piljeok(poetry)	1719-20	Lee Myeongeon	1719	1	of Korean History	K.III-3
4	Joseon Tongsinsa Sigo	1811	Pi Jongjeong	1811	1	National Maritime Museum of Korea	K.III-4
5	Kim Euisin Seochup	1655	Kim Euisin	1655	1	Busan	K.III-5
6	Jin Dongik Pil Haengseo	1811	Jin Dongik	19th century	1	Museum	K.III-6
7	Dharmajeolodogangdo	1636	Kim Myongguk	1636	1	National Museum of Korea	K.III-7
8	Mukmaedo	1763-4	Byeon Bak	1764	1		K.III-8
9	Seokrando	1763-4	Kim Yuseong	1764	1		K.III-9
10	Eungdo	1811		1811	1	Busan	K.III-10
11	Sansudo	1811	Lee Euiyang	1811	1	Museum	K.III-11
12	Sansudo	1811		1811	1		K.III-12
13	Sansudo	1811	Songam	1811	1		K.III-13
14	Hwajodo	1811	Lee Euiyang	1811	1	National Maritime Museum of Korea	K.III-14
15	Hwajodo	1811	Goewon	1811	1	Busan Museum	K.III-15
16	Joseon Tongsinsa Bongbeolsigo	1811	Kodo Matsuzaki et al.	1811	1	National Maritime Museum of Korea	K.III-16
17	Jo Taeeok sang	1711	Kano Tsunenobu	1711	1	National Museum of Korea	K.III-17
18	Buyongando Byeongpung	1747-8		1747-8	2	National	K.III-18
19	Wonshimuleo Danseonbyeongpung	18th century	Hasegawa Mitsunobu	18th century	1	Palace Museum of	K.III-19
20	Mokdando Byeongpung	1811	Kano Moronobu	1811	1	Korea	K.III-20
21	Euiheon Seongmongryang Pil Haengseo	1719-20	Euiheon Seongmongryang	18th century	1	Busan Museum	K.III-21
22	Joseon Tongsinsa Suchangsi	1682	yamada Hukuken et al.	1683	1	National Maritime Museum of Korea	K.III-22
23	Dongsa Changsugip	1763-4	Seong Daejung et al.	1764	2	National Library of Korea	K.III-23

<Table 6> Cultural exchange records of Korea(23articles, 25items)

between the members of the missions and Japanese of various classes and status.

Cultural exchange records from Korea include 23 articles (25 items), 12 poetries, and 13 paintings. <Table 6> shows the summary

The handwriting(筆跡)(K.III-1) of Kim Seryeom(金世濂) and others is a collection of 7 poetries of Lim Gwang, Kim Seryeum the *Busa*, Hwang Ho(黃屎, 1604~1656) the *Jongsagwan* of the mission in 1636 (the 14th year of King Injo's reign) to Hanshu, the lord of Tsushima.

IV. Cultural exchange between Joseon and Japan on Diplomatic

Journey

1. Rituals from Hanyang to Dongrae

1) Officers under Samsa bid farewell to the king and depart to Dongdae

Samsa served the official letter from the king and led officers under Wonyeok to go out Gukmoon(國門) in a row, and the Seogye(書契) of Yejo, gifts, and miscellaneous goods were loaded at each place.

According to the record in Yeongjo 39(1763), the stage of journey was "Yangjae(良才)-Yongin(龍仁)-Juksan(竹山)-Chungju(忠州)-Mungyeong(聞慶)-Yecheon(醴泉)-Andong(安東)-Uiseong(義城)-Shin-nyeong(新 寧)-Yeongcheon(永川)-Gyeongju(慶州)-UIsan(蔚山)-Dongnae(東萊)-Busan(釜山)."

2) Rituals in Dongrae · Busan

(1) Greeting the official letter from the King in Dongnae

Dongnaebusa Jeong Mansoon (鄭晩淳, 1721-1781) prepared honor guards and greeted the official letter from the king on the road five ri ago.

He moved ahead, and military and Najol(羅卒), which would cross the sea, were lined up. The official letter from the king was enshrined in Yongjeongja(龍亭子), and the honor guards and military band led the way.

The three ambassadors wore formal uniforms and Wonyeok wore each of own dresses and entered to the Southern gate in a row. There were thousands of people watching from the left and right sides of the road.

The official letter of the king was enshrined to Gaeksa(客舍, Guesthouse), and the three ambassadors received *Yeonmyeongrye*(延命禮) by *Busa*.

(2) Greeting the official letter from the King in Busan

Five ri before Busan, *Jwasooyeong Woohoo*(虞候) · *Changwon Busa* and other officers greeted the official letter of the king, and arrived at Guesthouse and held a *Yeonmyeonrye*.

(3) Haesinje(海神祭)

Haesinje was held in Yeonggadae, Busan. It is a ritual held to the god of the sea to pray for the safety of the voyage.

Some adjustments were made in accordance with local circumstances since the ritual involved arranging utensils and ritual items from the provinces.

Since 2006, representation of ritual for sea gods has been held annually in Busan, and During Haesinje we serve food to the god of the sea. Study about these ritual food is conducted.

(4) Private banquet hosted by Jwasoosa

Huge banquet was arranged at guesthouse and government office building.

It was a meaningful banquet to console the members of the Tongsinsa ahead of a major mission and pray for their safe return.

Gisaengs and bands from the surrounding area were gathered to play music and dance.

A temporary stage Bugye(浮堦) was installed, and gisaeng wore Gahwa(假花) on head.

It is necessary to reconstruct it as an example of the rituals of local authorities.

(5) Departure and sea route itinerary

The *Choolyeongseon*(出迎船) offered from Thushima domain led ship of Tongsinsa to Thushima domain. The ships of the Tongsinsa's consisted of three Giseon(騎船) and three Bokseon(卜船).

The six ships were accompanied by two interpreters, two security guards, two boatmen, and two servants

The ship of the *Jeongsa* was distinguished by writing "正" in red letters on the blue flag, ship of *Busa* by writing "副" in white letters on the yellow flag, and ship of *Jongsagwan* by writing "從" in white on the red flag.

The Bokseon was marked by Jeongbok(正卜), Bubok(副卜), Jongbok(從卜) and followed by each Giseon.

However, since it is difficult to distinguish six ships because they have the same appearance, a new item was decided to distinguish the *Giseon*(騎船) · *Bokseon*(卜船) with the large and small number of lamplight and lantern light, cannon, and gunfire.

2. Arrival to Tsushima and ceremony

1) Arrival

The lord of Thushima Domain and old monk came in a boat to welcome the members of the Joseon Tongsinsa.

The members of the Tongsinsa lifted up the official letter of the king and entered Seonsansa(西山寺). It is said that there were almost more than 10,000 people watching from the left and right sides of the road.

2) Disembark banquet and cultural exchange

(1) Disembark banquet

The disembark banquet was organized at the place of Lord of Tsushima Domain. The official national banquet was held, followed by private banquet

According to their status, the member of the missions received the award after performing courtesy at each position provided inside the pillar of the building, outside the pillar of the building, on the stone

steps, and under the stone steps.

The venue of the event and the procedure of the ritual were drawn in a drawing and decided after consultation.

(2) Cultural exchange

During the stay in Tsushima, the lord asked for a clerk, painter, and equestrian feats performers to show their talents.

3. Journey from Thushima to Edo

1) Departing to Edo under the lord of the Thushima domain's escort

(1) Thushima~Osaka

It was a sea route, and under the guidance and escort of Japanese ships, Joseon ships formed a fleet.

(2) Escort

The Japanese beat the drum thrice, and the members of the mission blew the trumpet thrice and went out. The lord of Tsushima domain led in front of them, and each ship was guided by Japanese ships

Cultural exchange

Poetry was exchanged, Confucianism \cdot medical science \cdot painting \cdot calligraphy and equestrian feats were performed passing through 22 domains.

2) Enter Osaka

(1) Enter accommodation in Osaka palace

Yongjeong(龍亭), who led to *Gichang*(旗槍) and *Sogo*(簫鼓) and enshrined the official letter of the king, stood, followed by a palanquin with three ambassadors.

(2) Shogun's evoy's delivering official letter, Shogun's Sookgongyeon(熟供宴)

The three ambassadors and the military officers wore formal uniforms and went out to the wide floor and sat down. The floor was 50 to 60 compartments and was surrounded by silk.

(3) Osaka~Yodoura

It is a journey by Japanese ship on a route along the river path.

In Osaka, they shifted to a splendid decorated river boat provided by Bakufu and went upstream to Yodogawa.

Left 106 soldiers and Gyeokgun, including the Joseon Dynasty's ship in Osaka, and the official letter of the king was transferred to the river boat, and the envoys were transferred to the Japanese ship, *Chaeseon*(彩船)

3) Enter Gyoto

The lord of Tsushima domain took the lead, and the procession of the Tongsinsa reached tens of $ri(\pm)$ with a grand military service.

Every member of the Tongsinsa under Samsa rode palanquins and horses provided by Japan.

Samsa rode Okgyo, which was splendid and extravagant, different vehicles were provided to Sanggwan and Joon-gwan

The Japanese side's courtesy regulations, which classified vehicles according to the level of ambassadors and changed the number of attendants, are revealed in the paintings of procession.

Before entering Kyoto, they changed from plain clothes to official uniforms at Silsangsa Temple.

4. Ceremonies in Edo

1) Enter Edo

(1) Ambassadors, enter in uniform

The member of the missions wore uniforms, and Tsushima Tongsa(通詞) led the way in front of them. In the afternoon, they entered Edo and stayed in *Silsangsa Temple*(實相寺).

(2) Byeolyeon(別宴) or Hamayeon(下馬宴)

A banquet hall was set up in the shrine of *Silsangsa Temple*, which is an accommodation, and even though it was the largest temple hall among the temples passed by, additional house was installed.

The three ambassadors and the military officers wore formal uniforms and went out to the wide floor and sat down.

2) Ceremony of delivering the official letter of the king

(1) Discuss about Uijoo(儀註) in advance

Announced the day of delivering the king's order, the lord of Thushima domain and Gwanban(館伴) requested for Uijoo(儀註) and discussed the procedure with map. Checked Gongsa Byeolbok(別幅) items a day ago.

(2) Enshrinement procession of official letter from the king from guesthouse to Shogun's palace

Enshrinement procession of official letter from the king from guesthouse to Shogun's palace The official letter from the king symbolizes the king of Joseon, so an appropriate escort was made.

On the day of the *Jeonmyeongrye*, the lord of the domain sent envoy to go to the shogun's place. *Cheongdogi*(清道旗) preceded the way, and *Soonshigi*(巡視旗), *Yeong-gi*(令旗), *Jeolwol*(節鉞), *Dook*[纛], *Daegi*(大旗) and the band *Gochwi*(鼓吹) followed them playing the music. *Saryeong*(使令) · errand boy(小 童) · military officers led and *Yongjeong*, which enshrined the official letter of the king, and other members followed the procession in official uniforms.

The Shogun's palace was ternary, and there were nine gates. When the procession with the official letter

of the king arrived to the fifth gate, the music stopped and officers under Sanggwan got off horses.

At the sixth gate, Sangsanggwan · Jesoolgwan · principal physician stepped out of the palanquins. At the seventh gate, Samsa stepped out of the palanquins.

The lord of Thushima domain, *Jangro*, and two *Gwanbans* welcomed the members of the missions and reached the eighth gate and the *Yongjeong* stopped.

Sooyeok Dangsang enshrined the official letter of the king from Yongjeong. Next, and lead officials under Samsa followed him.

(3) Delivering the official letter of the king

The seats were constructed in three levels. The shogun sat on the top level, *Sangdang*. The official letter of the king was enshrined on the second level. Gifts were displayed on the bottom level, and consul and officers above 4th grade sat on the sides.

(4) Tea ceremony and banquet

The tea ceremony was held under the supervision of the Shogun, and the banquet was held under the supervision of three *Nabeon*(納言).

3) Cultural exchanges in Edo

(1) Equestrian feats

Equestrian feats were held at the riding ground at Shogun palace. The Shogun hung silk curtains in front of him from high story of turret and enjoyed watching the feats.

(2) Private banquet by Lord of Tsushima at Edo mansion

Three ambassadors and military officers attended in uniforms, and the banquet was held as official banquet.

(3) Watching Archery

Upon request that wants to see archery. Eight people were selected to dispatch in 1719 (the 45th year of King Sukjong's reign) and in 1748 (the 24th year of King Yeongjo's reign).

4) Ceremony of receiving Shogun's reply and Sangmayeon

(1) Ceremony of receiving Shogun's reply(受回答儀)

When the consuls came to the ambassador's residence with a chest containing the Shogun's reply, the three ambassadors wore formal uniforms, and the members of the Tongsinsa were also suited up according to the regulations and went out to the wide floor.

The shogun delivered return gifts via courtier.

(2) Sangmayeon(上馬宴)

The shogun held Sangmayeon to every member of the mission.

At Sangmayeon in 1711, Japanese court music Gagaku(雅樂) was played.

Gagaku was formed in the Heian period (794–1192) during the early 9th century, and it had two types: Gaku(唐樂, *Jwabang*) and Gomagaku (高麗樂, *Woobang*, including music of Koguryo, Baekje, and Silla)

5) Rituals at Nikko Mountain: held thrice in 17th century, in 1636, 1642, 1655

After Tokugawa leyasu died in 1636, the corpse was moved to Nikko Mountain, and the Japanese emperor gave a divine name to Tokugawa leyasu "*Dongjodaegwonheyon*(東照大權現)." In 1645, Dongjosa Temple was promoted to Dongjogung Palace, and sanctuary work was carried out. After the completion of the Nikko Shrine, an envoy was sent to Joseon to request for hanging board and poetry of the king, and the Joseon court allowed it. Joseon cast and sent a bell with hanging board written "日光淨界" in the handwriting of Lee Gwang(李珖), the *Euichang-goon*(義昌君).

Mission in 1636

Since Japan requested for visiting Nikko Mountain, the member of the missions accepted the request and burned incense. The Joseon Tongsinsa had visited Nikko Mountain thrice, including 1643 and 1655 missions.



Figure 12. Joogilgwangdo, 《Dongkosayeongihoigwon》 part, 1640s, 36.2x189.1cm, Gijoodongjogoong Japan



Figure 13. Hyojong's caligraphy 'Youngsanbubgyesoonghyojeongwon', 1655, 47×253cm, Rinnoki(輪王守), Japan.

Mission in 1643

The Sansa Yoon Soonji(尹順之) and the Busa Jo Gyeong(趙絅) took funeral orations and offerings, which are bestowed by the king Injo, and held a memorial service. The procession of the Tongsinsa, heading to Nikko mountain with sacrificial food is described in the painting *<Dongjosayeongi*(東照社縁起)(仮名本)> (<Table 8> JIII-14).

Mission in 1655

The king of Joseon Dynasty Hyojong bestowed eight letters in his handwriting-"靈山法界崇孝淨院(영산 법계중효정원)" to Taiyuin Temple(大猷院, the shrine of Tokugawa leyasu 德川家光).

In addition, Hyojong bestowed 10 instruments for court ritual music (seul(瑟) · eo() · geomungo(琴) · jeok(笛) · ji(篪) · yak(籥) · gwan(管) · hoon(塤) · chook(柷) · jin(eo · chae) · toongso(蕭)). Among them, seul · chook · eo · toongso were handed down to present day. The handwriting of Hyojong has been handed down as well. Candle, candlestick, incense, and utensils for performing rituals were dedicated for the ritual.

6) Trip back to Joseon

Sangsunyeon(上船宴), which is farewell banquet and embark ceremony, was held in Thushimna.

V. Types of Paintings and Utilization

The records for the UNESCO listing of the Joseon Tongsinsa contain 63 articles (124 items) in Korea and 48 articles (209 items) in Japan, and these records are largely classified into three categories: diplomatic records, travel records, and cultural exchange records.

Among them, the list of painting materials includes 19 articles (23 items) in Korea and 28 articles (39 items) in Japan, which are mainly classified into the history of travel and cultural exchange.

The paintings of Korea and Japan are summarized in <Table 7> and <Table 8>.

1. The Picture of the Tongsinsa Procession.

1) Production and function of the Picture of the procession

(1) Production aspects of the picture of the procession

The pictures of the Tongsinsa procession depicted the procession of the missions in sequence without surrounding background.

The indications of the name written in calligraphy, such as "Cheongdogi(清道旗)""Hyeongmyeong(形名)" are the feature of the picture and provide information of the members of the mission.

The pictures of the Tongsinsa procession make up the largest portion of visual materials. Three pictures of the Tongsinsa procession are registered on UNESCO Memory of the World list, and 50-60 pictures are

No.	Title	Year	Produced by	Size(cm)	Number	Custodian	Document No.
1	Injo2nyeon Tongsinsa Hangryeoldo	1624	Author unknown	32.2×945.4	1	National Library of Korea	K.II-33
2	Injo14nyeon Tongsinsa Edoseongdo	(1636)	unknown	30.6×595	1	National Museum of Korea	K.II-34
3	Sukjong37yeon Tongsinsa Hangryeoldo	1711	Dawara Gijaemon	7.2×3738/4172/ 3965/4300	4	National Institute of Korean History	K.II-35
4	Saroseunggudo	1748	Lee Seongrin	35.2×70.3	1	National Museum of	K.II-36
5	Waegwando	1783	Byeon Bak	131.8×58.4	1	Korea	K.II-37
6	Gukseonuseondo	unknown	unknown	58.5×1523.5	1		K.II-38
7	Dharmajeolodogangdo	1636	Kim Myongguk	98.1×48.3	1	National Museum of Korea	K.III-7
8	Mukmaedo	1763-4	Byeon Bak	108×34.6	1		K.III-8
9	Seokrando	1763~4	Kim Yuseong	75.5×28	1		K.III-9
10	Eungdo	1811		124.3×42.4	1	Busan	K.III-10
11	Sansudo	1811	Lee Fuivang	131.3×54.5	1	Museum	K.III-11
12	Sansudo	1811	Laiyang	72.3×145.3	1		K.III-12
13	Sansudo	1811	Songam	98×31.2	1		K.III-13
14	Hwajodo	1811	Lee Euiyang	94×42	1	National Maritime Museum of Korea	K.III-14
15	Hwajodo	1811	Goewon	112×62	1	Busan Museum	K.III-15
16	Jo Taeeok sang	1711	Kano	97.7×47.1	1	National Museum of Korea	K.III-17
17	Buyongando Byeongpung	1747-8	Tsunenobu	180.5×384	2		K.III-18
18	Wonshimuleo Danseonbyeongpung	18th century	Hasegawa Mitsunobu	181×94	1	National Palace Museum of Korea	K.III-19
19	Mokdando Byeongpung	1762	Kano Moronobu	162.5×409.2	1		K.III-20

<Table 7> UNESCO Registered paintings of Korea

housed in the Museum of the City of New York and SOAS in London, among others.

Until the mid-17th century, the pictures of Tongsinsa procession were depicted in Ukiyo-e genre painting folding screens as procession of foreign missions. From 1682, the picture of Tongsinsa mission became independent genre of paintings.

<Cheonhwado folding screen of Joseon Tongsinsa entering Edo (天和度朝鮮通信使登城行列圖屛風)> (Osaka museum of history collection) is the earliest picture of Tongsinsa procession.

It depicted the members of the mission entering the Edo castle and recorded the total distance from

Joseon to Edo, seaway route and its distance, land route and its distance from Osaka to Edo castle, and official title, name, and the number of members of the mission next to the procession in calligraphy.

It was a painting that emphasized the record aspect rather than appreciation.

Except for registered documents, there are Onodorin's (小野等琳) <Scroll of the procession of the Joseon Tongsinsa (朝鮮通信使行列圖絵卷)>(27×474.6cm, Edo Tokyo Museum), Gano Aikei's (狩野水敬) <Scroll of the procession of Joseon Tongsinsa>(Museum of City of New York), and Hishikawa Gwa's (菱川派) <Scroll of the procession of Joseon Tongsinsa>(Osaka Museum of History) printed in wood block painting, and three more paintings are found.

Onodorin's <Scroll of the procession of the Joseon Tongsinsa> painting was highly appreciated for its uniqueness. Hishikawa Gwa's wood block painting was printed in large scale as a response to the high demand of public. Later, the paintings of processions, which were wood printed became multicolored printing Nisiki-e(錦繪).

Since 1682, the picture of the Tongsinsa procession had been actively produced on every mission.

In 1711, 14 paintings of procession were produced under Bakufu's order-Shinsadjoong, Shinsadeungseong, Shinsachanchakguiro, and Jongtsushimajuho -hangguiro, highlighting the pinnacle of paintings of the Tongsinsa procession.

Since then, the painting has been considered meaningful as a realistic documentary of the actual procession, unlike the image of the 17th century's fictionalized foreign mission.

(2) The use and function of picture of Tongsinsa procession

① Appreciative documentary painting

Although Bakuhu invited the Joseon Tongsinsa to Japan at a huge cost, Bakuhu of Japan showed off Bakuhu's prowess by recognizing him as "Bakuhu taking backup from Joseon."

It was used as an opportunity to secure the legitimacy of the regime by informing the Bakufu's power to the samurai, merchants and industrialists, and the common people, including daimyo(大名).

The procession of the Joseon Tongsinsa, which came to deliver advanced foreign cultures, was described as a grand painting of procession, and their diplomatic rituals were recorded and used as appreciative paintings.

2 Practical reference painting

The paintings were used as references for the people who were in charge of hospitality and diplomatic protocol. It was a reference material for organizing the order of the procession, such as bands, honor guard, various palanquins, and clothes, and arranging escort and reception personnel.

③ Public woodprints and multicolored print

With people's increasing interest in viewing the procession, the publication of woodblock prints thrived as a professional guide to provide detailed information on the procession.

It was also produced in multicolored print Nishiki-e, which shows an expansion for the common people.

No.	Title	Year of Embassy	Produced by	size(cm)	Number	Custodian	Document No.
1	Chosen Tsushinshi	-	-	Calligraphy on paper, 79×168	1	Junko Doi	J.II-5
2	Goshu Gamo-gun Hachiman-cho Soezu	-	-	Painting on paper, 82.2×98	1	Omihachman City Library	J.II-6
3	Shotokudo Chosen Tsushinshi Gyoretsu Emaki	1711		Painting on paper, 27.7×1476.7/1462.9/1365.1	3	Osaka Museum of History	J.II-7
4	Chosen Tsushinshi Sanchaku Kiro Gyoretsu-zu	1711	Tsushima Domain	Painting on paper, 28.5×1321.7/1243.9/1297/1257.1	4	Koryo Museum	J.II-8
5	So Tsushima-no- kami Goko Kiro Gyoretsu-zu	1711		Painting on paper, 28.5×1451/1321.7/1590.6/1255	4	of Art	J.II-9
6	Enkyo 5-nen Chosen Tsushinshi Tojo Gyoretsu-zu	1747-48	Anonymous district manager	Painting on paper, 34.8×552.5	1	Shiminiseki Munipal Chofu Museum	J.II-10
7	Chosen-koku shinshi Emaki	-	Tsushima	Painting on paper, 38.2×811.9/955	2	Nagasaki Perfectural Tsushima	J.II-11
8	Chosen-koku shinshi Emaki	1811	Domain	27.3×1657.4	1	Museum of History and Folklore	J.II-12
9	Tennado Chosen Tsushinshi Tojo Gyoretsu-zu Byobu	1682	-	4.3×437	1	Osaka Museum of History	J.II-13
10	Chosenjin Raicho Oboe Bizen Gochisosen Gyoretsu-zu	1747-48	-	14.5×824.9	1	Kure City Ranto Cultural Foundation	J.II-14
11	Chosen Tsushinshi Kaminiseki Raiko- zu	1763-64	-	60.3×86.8	1	Chosenji Temple	J.II-15
12	Shotokudo Chosen Tsushinshi Kokusho Sendosen-zu Byobu	1711	-	75.2×510.4	1		J.II-16
13	Shotokudo Chosen Tsushinshi Jokokan Daisansenzu	1711	-	79×148/111.5	2	Osaka Museum of History	J.II-17
14	Chosen Tsushinshi Gorosen Byobu	-	-	137.2×349.8	1		J.II-18
15	Chosen Jinbutsu Kijo-no-zu	1811	Inokai Shikou	35.2×625.9	1	Hosa Library, City of Nagoya	J.II-19

<Table 8> UNESCO Registered paintings of Japan

No.	Title	Year of Embassy	Produced by	size(cm)	Number	Custodian	Document No.
16	7-5-3 Moritsuke Kuridashi-hjun-no- Ezu	18 th Centuny	Tsushima Domain	26.9×937.1	1	Nagasaki Perfectural Tsushima Museum of History and Folklore	J.II-20
17	Chosenjin Kyoo 7-5-3 Zenbu-zu	1811	Inokai Shikou	30.1×20.8	1	Hosa Library, City of Nagoya	J.II-21
18	Bajosai Zukan	-	Hirowatari Yukinoshin	26.9×937.1	1	Entrusted Tsushima Museum of History and Folklore by Mr.Kazuyuki Matsubara	J.II-22
19	Bajosai-zu	-	Torii KiyonobuII	52×81.4	1	Koryo Museum of Art	J.II-23
20	The Biwako-zu	-	円山應震 1790-1838	57.5×146.6	1	The Museum of Shiga Prefecture Biwako- Bunkakan	J.II-24
21	The Chosen Tsushinshi Shodo- zu	1711	Hanabusa Iccho	91.4×28	1	Osaka Museum	J.II-25
22	The Fuzan-ura Fuji-zu	18 th Centuny	Kano Michinobu	57.9×92.8	1	of History	J.II-26
23	Chosen Tsushinshi Kantai Byobu	1655	Kano Masunobu	166.6×500	2	Sennyuji Temple	J.II-27
24	Kim myeingguk Hitsu Jittoku-zu	1636or43	Kim myeongguk	64.5×52.8	1	Simonoseki Munipal Chofu Museum	J.III-7
25	Shosho Hakkei Zuka	1682	Kano Kiyomasa	30.8×534.6	1	Osaka Museum	J.III-10
26	Ju Rojinzu	1636	Hadam	42×55.1	1	of History	J.III-11
27	Shoka Ko-zu	1763-64	Byun Bark	123.3×54.5	1		J.III-12
28	Toshosha Engi	1640	Kano Tanyu et al.	33×1636	1	Nikko Toshogu Shrine	J.III-14

These pictures of Tongsinsa procession were intended to be given as gifts to those who did not see the procession or to be kept as souvenirs.

It was also used to obtain information of the procession through the picture while viewing the procession.

The procession of Joseon Tongsinsa served as an opportunity for the creation of a procession of Dangin(唐人)

and Dangja(唐子) dance at a private festival in Japan.

"Dang" means a foreign country, and it was included in the procession of 24 people at the festival held every October.

They participated in the parade wearing masks expressing joy, anger, sorrow, and pleasure, and were designated as Mie Prefecture's intangible folk cultural properties in 1991.

In Ushima-do Town, Okayama Prefecture, a dance called "dangja-yong," or karako, is said to have been made after watching two errander boys dancing face to face.

2) Understanding composition of the procession

The Tongsinsa usually comprised 500 members.

Take a look at the overall composition of the Dawara Gijaemon(俵喜左衛門)'s painting <Entering the Edo castle> of <Picture of Tongsinsa procession in the 37th year of Sukjong> in 1711, which depicts the most extensive Tongsinsa Procession.

Out of 500 members of Tongsinsa, 129 remained in Osaka and 371 traveled to Edo, which was about 2,000 people, including the number of escorts from Tsushima.

The members wore casual clothes on the land route, but the entrance to Edo Castle was an official trip to deliver the Joseon king's official letter and presents; thus, they wore official uniforms and observed formalities.

Therefore, "the painting of entering Edo castle" specifically depicts the official travel of the members of the Tongsinsa in formal uniforms in Edo, the capital of Japan.

2. Seondando(船團圖)

1) Tongsinsa Ships

There were six Tongsinsa's ships.

Three ships carried three ambassadors and members of the Tongsinsa, and the other three ships



Figure 14. Kim Yoonyeom, <Shinhangdohaeseon>, mid-18th century, 22.5×31.5cm, Korean Art Gallery, DPRK.

contained food, gifts, and luggage.

The ships were colorful and large as the ambassadors carried the official letter of the king.

Sagwan traveled on middle-sized ship, and small ship carried luggage.

Meanwhile, the early 19th century record *"Mangiyoram*" prescribed to organize two vessels for Busa to travel on vessels as well.

The Tongsinsa's vessels are depicted in 18th century painter Kim Yoonyeom's paintings, *<Shinhangdohaeseon*(信行渡海船)> (Korean Art Gallery, DPRK), *<Joseon Tongsinsa Jeonsagwanseondo*>(Saga Prefectural Nagoya



Figure 15. <oseoninnaejogak Bijeoneonchijooseon Hangryeol>, 1748, 14.5×824.9cm, painting on paper, Nando Cultural Promotion Foundation



Figure 16. <Gookseonooseondo> part, 18th century, painting on paper, 58.5×1523.5cm, National museum of Korea.

Castle Museum). There are also many paintings preserved in Japan.

2) Haesang Seondando: Tongsinsaseon and Hosongseon

From Busan to Osaka via Tsushima, the Joseon Tongsinsa traveled by sea. From Osaka to Yodora, they traveled along the river by *Eonooseon*(御樓船) and *Cheoneojwaseon*(川御座船).

They traveled by land from Yodoura to Edo via Kyoto.

The appearance of traveling by setting up a fleet is described in various ways, indicating the reception system under Thushima or Bakufu's escort for the Tongsinsa on sea and river routes.

It can be used as an important data for the restoration of the procession of sea and river routes.

First, from Busanjin to Tsushima, Thushima bun was in charge of escorting and guiding the Joseon Tongsinsa ships. On the sea route from Tsushima to Osaka, ships were mobilized from each section in addition to Tsushima to participate in the escort.

In this section, you can see that each ship and six Joseon Tongsinsa ships jointly set up a fleet.

This Joseon and Japanese marine parade shows splendid Tongsinsa ships and each bun's guiding ship, symbols, and flags.

A representative painting is < *Joseoninnaejogak Bijeoneonchijooseon Hangryeol*(朝鮮人來朝覺備前御馳走 船行列)> (Table 8 No. 10). This painting depicts the sailing scene over 8m when the carrier fleet departed from *Momonoura*(鞆の浦) in May 1748 and arrived at *Hibi*(日比).

More than 1,000 ships of Ikeda Bun(池田藩), who were in charge of escorting and guiding 6 ships of the Tongsinsa, formed a fleet of ships and held a sea parade, and men and women watching them filled the mountains and seas along the way.

3) Hasang Seondando: Eonooseondo, Cheoneojwaseondo

On the river road from Osaka to Kyoto, transferred to the Japanese ship, Nooseon(樓船).

Because the Tongsinsa's ships were heavy and difficult to sail on shallow river roads, they traveled by ships provided by Japan.

The paintings of colorful Japanese Eonooseon take the form of scrolls or folding screens (see 5 in <Table 7>, 12-14 in <Table 8>.

The Korean side's <Gookseonooseondo(國書樓船圖)>(No. 5 in Table 7) is a painting of Jeongsa, Busa, and Jongsagwan transferred to Nooseon provided by Japan.

3. Paintings related to cultural exchange

1) Ukiyo-e genre paintings

(1) The Joseon Tongsinsa missions roaming Edo center in the mid-17th century

In the 17th century, the Joseong Tongsinsa missions were depicted in Japanese ukiyo-e genre paintings and clearly revealed their images as foreign envoys who came to disseminate its advanced culture.

《Edodo Folding screen》(a pair of six-panel folding screen, Japan, National Museum of Japanese History) feature a procession of Tongsinsa passing through the Daimyo mansion and entering Otemon(大手門), the main gate of Edo Castle, in the lively city center of Edo.



Figure 17. 《Edo Folding Screen》 Left side, entire 162.5×366cm, National museum of Japanese History.

It depicts the arrival of a group of *Jeongsa, Busa, Jongsagwan,* and others with flags and protest officers at the forefront.

Ginseng, fabrics, ceramics, colored papers, brushes, tiger skin, leopard skin, which were gifts from king of Joseon dynasty, were displayed at square near *Haseung-gyo*(下乘橋).

However, the uniforms of the Joseon Tongsinsa reflect Bakufu's intention and public's desire to recognize them as foreign envoys with advanced culture by portraying them as envoys with exotic images rather than realistic depictions.



Figure 18. Gano Masunobu, 《Joseon Tongsinsa Hwandaedo Folding screen(朝鮮通信使歡待圖屛風)》, 8screens, pair, right part.

(2) Description of a Jeonmyeongrye

《Joseon Tongsinsa Hwandaedo Folding screen(朝鮮通信使歡待圖屛風)》(a pair of eight-panel folding screen, JII-27) was painted by Gano Masunobu(狩野益信, 1625-1694), and the screen on the right depicts the procession of the Tongsinsa's entrance in 1655.

This folding screen painting is the earliest illustration of the Tongsinsa's entrance to Edo Castle

Furthermore, it is of great significance that only the Joseon Tongsinsa is depicted in a huge pair of folding screens.

This folding screen is a relic of Emperor Komizuno's Empress Tofukumonin.

It is presumed to be a folding screen dedicated to the Empress, the daughter of Hidetada Shogun, and it is assumed that the Joseon Tongsinsa's visit to Japan at the time attracted attention even within the imperial family.

Compounded view to the Joseon Tongsinsa

The Joseon Tongsinsa, which appeared in the 17th century Japanese ukiyo-e genre paintings, depicts the lively Edo city area and the Tongsinsa marching through the city center with the attention of Edo public, implying the anticipated Japanese view of advanced culture propagators. It also reveals Bakufu's intention to highlight the role of the delegation who came to offer condolences by revealing official letter of the king and various gifts.

2) Painting of equestrian feats

Equestrian feats were especially loved by Tokugawa Shogun and were performed every time Tongsinsa



Figure 19. Bajosai-zu, 52.2×81.9cm, Koryo Museum of Art, Japan.



Figure 20. Bajosai Zukan, 26.9×937.1cm, Entrusted Tsushima Museum of History and Folklore by Mr.Kazuyuki Matsubara

visited. It was a technique that received popularity among the Japanese public as they were also given a chance to watch it during the Shogun's viewing.

There are various equestrian feats, including "Standing on a horse(馬起立)," "Standing upside down on a horse(馬起立)," and nine performances are introduced as painting materials in Japanese 「Samhancheop(參韓帖)」, produced in the early 18th century.

Research on equestrian feats of Tongsinsa has also been conducted in various fields, and most of the paintings depicting equestrian feats have been produced representing each mission and reaching more than 10 cases.

The military officers who performed equestrian feats wore military uniforms and were different from ordinary military uniforms.

They wore brightly colored clothing,

which was specially made with bestowed high-quality silk fabric.

Furthermore, the court of Joseon dynasty provided excellent horses and saddles imported from China. Various arrangements were made for the delegation to show its best skills and enhance the national prestige.



Figure 21. 辻井竹窗, ≪Sankancho≫ 3, 1712, National Diet Library of Japan.



Figure 22. 辻井竹窗, ≪Sankancho≫ 1, 1712, National Diet Library of Japan.

There are only two paintings of equestrian feats (J-2-22, J-2-23) in UNESCO-listed materials, but the number of unregistered visual materials is higher, and the content is abundant.

3) Paintings of clothes and objects

Joseon paid immense attention to the costumes of the Tongsinsa because they wanted to flaunt their superiority as a cultural country and enlighten Japan by revealing that the costumes of the Tongsinsa had embraced the system of Sinocentrism.

Japanese shogunate also believed that the members of the mission in gorgeous dresses would help in strengthening stature.

As such, Joseon's pride and Japan's attention were also focused on the clothes of Tongsinsa missions.

At the time of dispatch in 1711, the Shogun sent a painter to draw a *jobok*(朝服) and a *yang-gwan*(梁冠), and paintings of the clothes believed to have been painted at that time are still handed down today.

Therefore, as a record and appreciation of the Chinese clothing system, the clothing painting of the Tongsinsa was accurately described and handed down.

The paintings of the Tongsinsa's clothes are detailed in *Samhancheop* and *Joseonbingsasanghae*, produced around 1711 with clothing paintings of Jeongsa and Busa, including retinues.

The National Institute of Korean History's collection *<Tongsinsailhangchakbokjido*(通信使一行着服之 圖)> is believed to depict the clothing of the mission dispatched in 1811. It is described by dividing into *<Jeonjangbokjido*(正裝服飾圖)> for formal diplomatic procedures and *〈Hyangeungbokjido*(饗應服飾圖)〉 for banquets.

The painting of clothes included in *<Joseoninmulgijang-gyoyeojido*(朝鮮人物旗杖轎輿之圖)>(J-1-19 in Table 8), *<Joseon Tongsinsa Inmuldo>* (1811, 30.3×984cm, Tokyo National Museum), was also produced around 1811.

In addition to paintings of clothes, paintings of various objects such as musical instruments, weapons,



Figure 23. Lee Seongrin, <Shogunyeonhyang> of 《Saroseunggoodo》, 1748, 35.2×70.3cm each, National Museum of Korea.

flags, and palanquins recorded in Japan can be understood as references that produced to examine "the system of the great Ming," as stated in the preface of *Joseonbingsasanghae* above.

4. Paintings of scenic sites and maps

1) Accompanied painter's scenic site paintings and maps

One of the basic tasks of the accompanied painter was to draw a map of major areas.

Various geographical information such as the Tsushima map and the Japanese land map were also collected.

On the mission in 1763, Jeongsa Jo Eomdo got revised Japanese map and made the painter Kim Yooseong(金有聲) paint it.

The accompanied painters also painted the real landscape. On 1748 mission, the accompanied painter, Lee Seongrin's work 《Saroseunggoodocheop(槎路勝區圖)》(KII-36 on 〈Table 7〉) consisted of 30 paintings.

These paintings can be classified into 17 paintings of places where they stayed during their journey from Busan to Edo, and five paintings of special events experienced by the members of the mission.

<Shogunyeonhyang(關白讌享)>, which depicts the banquet scene hosted by the shogun, can be said to have drawn an important experience for the members of the Tongsinsa.



Figure 24. Osaka, 《Daeilvonodojoongdo folding screen》, The Mitsui Memorial Museum.

In addition, <Thushimabujoong(對馬島府中)> drawn by Lee Eui-yang(李義養) on 1811 mission is handed down in 《Leeshinwonsasangcheop(李信園寫生帖)》(Kansong museum of arts).

2) Itinerary of the Tongsinsa according to picturesque map in Edo period

Dojoondo (道中圖) is the Japanese picturesque map in Edo period.

It served as a map and a tour guide, including geographical information such as land, sea route, and distance between cities, as well as mountain streams, fortresses, villages, and urban landscapes.

The Mitsui Memorial Museum (三井記念美術館)'s collection 《*Daeilvonodojoongdo folding screen*(大日本 五道中圖屛風)》, described in a colorful decorative painting style, is a picturesque map with a mysterious atmosphere of dark blue sea and golden mist.

This map depicts a panoramic map of Japan, including sea and land routes, so it is possible to track the route of the Joseon Tongsinsa in the Edo period.
Earlier, Shin Ki-su compared and reviewed the journey of Shin Yuhan(申維翰)'s 『Haeyoorok(海游錄)』 in the fifth volume of 『Daegye Joseon Tongsinsa』 along the path of Tsukushiji, Sanyodo, and Tokaido of this folding screen in 1719.

By linking 30 real-view maps depicted in *(Saroseunggoodo)*, the records of the missions, and *(Daeilvonodojoongdo folding screen)*, the itinerary of the Joseon Tongsinsa in the Edo period can be organized in a more three-dimensional manner to guide the dramatic historical site. In addition, the content that is linked to today's real world can be produced through this.

VI. Conclusion

As a result of investigating the precedent studies of the Joseon Tongsinsa, which have been accumulated so far, and the list of UNESCO Memory of the World, the Joseon Tongsinsa was found to be an excellent material to be produced in 3D tangible and intangible virtual contents.

First, the Joseon Tongsinsa has diplomatic and cultural exchange history of 200 years between Joseon and Japan from 1607 to 1811, along with many stories and historical materials, so there are many materials to be produced in 3D content.

Second, many materials of records and paintings are on the list of UNESCO Memory of the World, so story development and visual effects can be maximized when producing 3D content.

Third, only the communication in Chinese character and poem have received attention so far; however, Joseon Tongsinsa has various cultural exchange aspects too. There are various stories of interesting materials that can be produced in 3D content, including equestrian feats, archery, errand boy, and others.

Fourth, the costume of the Joseon Tongsinsa is an advanced culture and indicates that Joseon accepted Chinese culture. Moreover, in Japan, it was important to strengthen Bakufu's status.

It can be a good opportunity to experience the costume culture of Joseon Tongsinsa, which was expressed externally, by producing it into 3D content.

Fifth, it is good to be a proud Korean by informing the public through 3D content of the historical facts about cultural exchanges of Joseon Tongsinsa, which remained only in academic research.

K-content is receiving attention from people across the world. The Joseon Tongsinsa in 3D Tangible and Intangible Virtual content will be a good opportunity to re-examine and highlight Korea's status as a culturally advanced country that led the Confucian culture of Northeast Asia in the 18th century.

Development of a Training Programme on Heritage Data Management and Use for Heritage Managers

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Abstract

The development of digital technology has resulted in the advent of new media, standards, and devices for preserving, managing, and using heritage and relevant data. The use of these advanced measures has tremendously increased the generation of both digital data (which are converted from existing analogue resources) and born-digital data (which are originally produced in the digital form). These types of data are classified into individual objects and complex objects. Individual objects include the following: (1) text, image, video, and sound files used to collect, manage, preserve, and display heritage assets; (2) three-dimensional (3D) scan data; and (3) computerised tomography (CT) and X-ray data used for conservation science. Complex objects include contain (DBs) and websites. The aforementioned data belong to the category of digital heritage defined by the United Nations Educational, Scientific, and Cultural Organization(UNESCO). Information on the assurance of accessibility to digital heritage is provided in Article 2(Access to the Digital Heritage) of Charter on the Preservation of Digital Heritage(UNESCO).

Cultural heritage institutions such as museums have demanded new methods that can preserve, manage, and use heritage data as digital heritage data and can increase the accessibility to such data. Digital curation has been defined as the function of selecting, preserving, maintaining, collecting, and archiving digital assets. However, with the growing need for using an increasing amount of digital archival records, the concept of digital curation has been extended beyond the function of storing data and providing information, to that of providing customised digital information by searching for information in an intellectual manner and identifying a relationship between data. That is, digital curation is the process of archiving digital data considering active data use. This new method facilitates the preservation, management, and use of heritage data possessed by cultural heritage institutions including museums, and increases the accessibility to heritage data.

At present, digital platforms such as Europeana, e-Museum of the National Museum of Korea, and

National Cultural Heritage Portal provide digital curation services associated with the collection, selection, and supply of heritage data. However, these services cannot ensure the sustainable use of heritage data owing to their inability to reflect the characteristics of this data or effectively provide the socio-cultural context of heritage attributes and a semantic relationship of heritage data owing to data disconnection.

The essence of digital curation tasks for ensuring sustainable heritage data use is to provide the sociocultural context of heritage attributes and a semantic relationship of heritage data. Thus, it is necessary to develop a heritage ontology and a semantic heritage data network based on the characteristics of heritage data, as well as an interface for providing services that can be used by the public (such as a virtual exhibition). Notwithstanding such requirements, heritage institutions presently have few experts who can perform sustainable heritage-data use based on an extensive understanding of heritage data and digital curation.

To facilitate sustainable heritage-data use, heritage institutions should employ experts with special knowledge of the characteristics of heritage data and provide existing employees with theoretical and technical training for improving their capabilities in digital curation. To satisfy the requirements indicated above, this study developed a training programme for enhancing the digital competence of heritage managers based on theoretical and technical training contents related to digital curation. The proposed training programme consists of the following three stages: (1) data generation and selection, (2) data collection and preservation, and (3) data use. The first stage enables learners to analyse the characteristics of heritage data. The second stage enables learners to collect heritage data of various formats by using the designed metadata and learn long-term heritage data preservation strategies. The third stage enables learners to use the collected heritage data to design and generate heritage ontologies, and produce visualised contents for semantic networks and virtual museums based on storytelling.

This study has significance in that the proposed training programme can be used effectively to train employees responsible for the use and supply of heritage data in cultural heritage institutions (including museums) in Korea. Furthermore, the proposed training solution can be applied in international exchange programmes for enhancing the digital competence of global heritage-related workers for digital curation.

I. Digital Archiving and Heritage Data Management

1. Concept and background of digital archiving

Archiving refers to a method of recording contemporary memories and experiences, and passing these records to the next generation. At present, the term "archive" indicates a place or an organisation that systematically conserves records that deserve to be preserved permanently. Digital archiving is the process of preserving data produced based on digital signals such as sound and image files. The types and range of data that can be stored in a digital archive have been extended to those including texts, DBs, still images, videos, and webpages.

UNESCO defines that digital heritage "embraces cultural, educational, scientific, and administrative resources, as well as technical, legal, medical, and other types of information generated digitally or converted into digital form from existing analogue resources". Digital heritage is classified into born-digital heritage (which is originally produced in the digital format and includes only the original digital format) and digitised heritage (which is produced by digitising actual heritage attributes).

Analogue archive managers should maintain the temperature and humidity of the analogue archives for storing original heritage attributes at an appropriate level to preserve those attributes that can be damaged straightforwardly, such as paper and magnetic tape. They also limit the access of analogue archive users by restricting the time for using original heritage attributes and the number of uses of these attributes. Moreover, analogue archive users encounter physical limitations in obtaining the desired information. For example, they cannot conveniently gather scattered data owing to time- and distance-related problems, or obtain information associated with a search target.

The advancement of computing technology has established the foundation for overcoming the limitations described above. The application of digital technology in archives facilitated by technological development has largely occurred in the following stages: the establishment stage (from the late 1990s to 2004), spread stage (2005–2010), and use and enhancement stage (2011–2016). (Park 2017: 272) Furthermore, the purpose of digital archiving has advanced beyond the previous level of the accumulation and production of digital data, to its preservation and use. The range of main targets of digital archive services has also extended beyond experts to include the public. Accordingly, these services contribute to both data structurisation and supply of intellectual information. (Choi 2014: 36)

2. Characteristics and limitations of the digital archive

1) Characteristics of the digital archive

(1) Resolution of difficulties in spatial securement

The advancement of digital technology has prepared the environment for digitising most archival data that have been accumulated in the form of materials such as paper or film. Analogue archives were required to provide sufficient space for storing large-volume archival data. However, this space-related problem can be solved by converting existing archival data into electronic records.

Lee conducted a qualitative survey based on six citizen archivists who had performed archival activities

in their regions. He observed that these archivists had demanded space for preserving and using local records that they had collected and produced. (Lee 2021: 107). Based on the survey result, this researcher emphasised the necessity of providing space as a measure for solving the problem of preserving and managing the increasing amount of records, which are being continuously collected, generated, and produced by recording activities.

Digital archiving is more advantageous than analogue archiving in that it can straightforwardly provide the required space based on virtual space unlike the other method (which is based on actual offline space). As long as an effective computing environment is ensured, digital archiving technology can facilitate the flexible use of space by downsizing or enlarging space, and can reduce the costs for spatial maintenance and management.

(2) Convenient maintenance of original heritage attributes and enhanced accessibility of users

The original form and contents of digital data can be maintained semi-permanently because digital data are not worn or damaged by continuous use. Based on this advantage, digital data can be conveniently replicated, transferred, and shared for information exchange. In addition, a dual preservation system can be adapted to protect digital data from various risks such as fire, theft, and war.

The Korean government enacted Article 6 (Electronic Creation and Management of Archives) and Article 21 (Dual Preservation of Important Archives) of the Public Records Management Act, and Article 49 (Storage in Preservation Media by Permanent Records Management Institutions) of the Enforcement Decree of the Public Records Management Act to recommend digitisation of records. In particular, the Public Records Management Act emphasises the necessity of preventing loss of the original of archives by stating that "the heads of public institutions and the heads of archives management institutions shall... endeavour to electronically manage archives that have not been created in electronic format."

Digitised data can be used in services for information management, storage, search, and viewing. Thereby, users of these services can more conveniently access digitised data. In this regard, digital archiving technology is a solution that enables users to simultaneously load and use various data at any time, without the temporal and physical limitations of the existing analogue archiving technology. This enhanced technology also establishes the foundation for advancing to a new knowledge society.

(3) Establishment of an intellectual information supply environment based on metadata

Digital archiving technology generates and controls metadata to efficiently manage digitised data. These processes facilitate efficient data search and enable users to conveniently access the information required for their purposes such as research and work.

Han classified digital archives into integrated digital archive (which provides archival content regardless of themes) and subject-oriented digital archive (which provides archival content on a certain subject). This researcher mentioned that subject-oriented digital archiving has the advantage of the intensive collection of relevant records. Accordingly, this researcher determined that subject-oriented digital archiving can develop archival contents in a deeper and broader manner than integrated digital archiving. (Han 2017:

44) The preparation of metadata is an essential condition for forming the aforementioned subject-oriented digital archive. When users search for information based on desired keywords, the subject-oriented digital archive provides both searched information and relevant information for users. Consequently, users can obtain satisfactory data from both quantitative and qualitative aspects without performing the search process several times.

(4) Reproduction of contents based on decentralisation of data

From ancient times to the pre-modern era, institutions that were developed to preserve and manage records (such as libraries, museums, and archives) were operated for the ruling class in the society. These were regarded as the symbol of prestige and respect concerning the preservation of contemporary records. (Hwang 2012: 23) However, the development of printing, communication, and computing technologies has resulted in the growth of the digital archive. It has been used particularly in the public sector, and its range has been recently extended to the private sector. Open digital archives enable users to conveniently access and use digitised archival data and participate in the reproduction of contents in diverse manners. They can participate in the archiving process by using the comment and tag functions generally used on social media. Otherwise, they can adopt a more complex approach to generate new content by rearranging digitised archival data in the desired manner. Digital archiving can contribute to the development of the basis for a diversified society that reflects the different opinions of its members.

2) Limitations of the digital archive

(1) Difficulty in providing physical viewing

Digital archiving has a limitation in that users cannot view the actual status of the digitised data stored in the digital archive. However, the advancement of various digital recording technologies such as photogrammetry and 3D scanning has facilitated the representation of digitised archival data at a level similar to that of the original. Notwithstanding the difficulty in enabling users to view the original, the digitised data by these technologies provide an advantage wherein users can use the enlargement function to observe these data in a more detailed manner beyond an observable range on the spot.

(2) Concerns over data loss caused by rapidly transforming digital technology

Digital files have limitations in that these depend on software and hardware technologies and that existing electronic records are unlikely to be preserved when the relevant digital technology degrades or vanishes. In this regard, continuous data management and maintenance requires a constant monitoring of relevant digital technology and the establishment of long-term data-preservation strategies. (National Archives of Korea 2019: 176) Hence, data management institutions should employ experts specialised in 1) the storage management technology used to ensure stable data backup and data redundancy and to monitor the storage status, and 2) migration technology that can prevent data damage caused by problems with file formats, data volume, or storage space during the data transmission process.



공공기관 문화체육관광부 산하 공공기관(32) 전체인력

Figure 1. Status of employees responsible for informatisation and data protection compared with the entire set of employees of public organisations under the Ministry of Culture, Sports and Tourism (reorganised by the researcher of this study)

(3) Obstacles in maintaining data integrity and authenticity

Individuals have continuously addressed concerns over the misuse or alteration of digital records owing to their convenient reproduction, editing, and transfer. There are also difficulties in maintaining the digital archiving system because of 1) the stringent procedures and methods for ensuring data integrity and authenticity of digital records, and 2) the increase in system maintenance costs. (National Archives of Korea 2019: 179) To solve these problems, the Korean government should establish a data management system that determines a permissible range of data used by users and handles issues regarding the copyright generated in the process of generating content based on electronic records. For this purpose, it should prepare the foundation for developing necessary systems and policies, and conduct training programmes to nurture data management experts who can effectively perform data management tasks.

(4) Deficiency of data management experts

Experts specialising in DB establishment and management should be nurtured to overcome the limitations indicated above. However, Korea is deficiency in the requisite infrastructure. The 2016 Korea Culture Informatization White Paper published by the Ministry of Culture, Sports, and Tourism reported that the employees responsible for informatisation and data protection accounted for less than 3% of the total number of employees of public organisations under the corresponding ministry. (Ministry of Culture, Sports and Tourism 2016: 2)

The National Archives of Korea is a representative archive management organisation in Korea. It stated that it may spend a considerable amount of time completing the process of converting the remaining analogue archives to digital ones considering the present conditions of the relevant labour force and

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Figure 2. The specific search page on e-Museum http://emuseum.go.kr/

equipment possessed. The digital heritage field is mainly examined in this study. It also encountered a deficiency of skilled experts and the outflow of talent who accumulate IT knowledge in the digital heritage field and then shift their jobs to work to other fields.

3. Cases of heritage data management

1) Cultural Heritage Standard Management System

The National Museum of Korea developed the Standard Artifact Management System (renamed the Cultural Heritage Standard Management System) in 1998 to computerise the management of its artefacts. The developed system was applied to the management of artefacts and the overall services designed to supply information on the National Museum of Korea (such as information on artefacts and the e-Museum provided on the official website of this museum).

It consisted of 133 specific elements. These were divided into essential items, management items, items on the movement of artefacts, specific items according to subjects, and management items according to organisations. It supported the functions of examination, searching, printing of forms as well as web services, based on the specific elements determined.

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Figure 3. The artefact search webpage on National Cultural Heritage Portal https://www.heritage.go.kr/main/?v=1670165209223

In 2015, the National Museum of Korea enhanced the existing Standard Artifact Management System to be operated in a cloud environment and renamed the advanced system as Cultural Heritage Standard Management System. It also constructed DBs and servers to manage each relevant institution in an integrated manner, and improved the

functions of the advanced system to add and adjust items of metadata of artefacts more conveniently. Furthermore, it conducted a project for establishing the integrated DB of its collection and distributed the Cultural Heritage Standard Management system to all the museums in Korea.

In December 2016, it performed full-scale reform of the e-Museum according to the Cultural Heritage Standard Management System to initiate a service for providing information on the collections of all the museums in Korea to the public.

On the renewed e-Museum website, visitors can search the collections of Korean museums by using the basic keyword search function and applying additional information such as the organisation that possesses the target object, origin, creation period, and material of the target object. They can also download and use the images of the searched data. These outcomes were derived from a project on the establishment of the national cultural heritage database, which was implemented from 2015 to 2016. Because of the implementation of this project, the renewed e-Museum website provides information on 290,000 possessions of 112 museums and 700,000 images of these possessions.

However, because the Cultural Heritage Standard Management System was designed to manage cultural heritage attributes, most of the descriptions provided by this system are related to information on such attributes. Consequently, this system displays insufficient performance in reflecting various types of cultural heritage information resources such as research reports and publications on cultural heritage.

2) National Cultural Heritage Portal

The National Cultural Heritage Portal is a comprehensive information system that provides various and substantial digital contents on approximately 2.5 million cultural heritage attributes including main designated ones (e.g. national treasures and other types of designated treasures) and artefacts possessed by all the museums in Korea. The establishment of this portal was part of a project for establishing a comprehensive national cultural-heritage information system. The project focused on developing a DB of the knowledge and information related to Korea's valuable cultural heritage attributes such as national



Figure 4. The webpage of CHA's Photo Studio on the National Cultural Heritage Portal. (3) https://www.heritage.go.kr/heri/culturalHeritagePhoto/default/list.do)

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Figure 5. The webpage of the Illustrated March of the National Funeral on the National Cultural Heritage Portal http://royaltombs.cha.go.kr/new/pop_state_funeral/index.html

treasures, other types of designated treasures, and designated cultural attributes to achieve the following objectives: (1) to scientifically preserve cultural heritage attributes, (2) to set up an integrated management system that is applied to all the regions of Korea, (3) to satisfy the cultural desire of the public and increase their creativity and quality of their lives based on the supply of online services, and (4) to increase the value of the cultural heritage by connecting the culture industry and tourism industry.

However, the metadata provided on the National Cultural Heritage Portal are identical to those provided on the previous website of the Cultural Heritage Administration (CHA). Therefore, the National Cultural Heritage Portal displays simple schemas of names, types, periods, etc., and presents only concepts in a wide range. Nevertheless, this portal provides definite advantages to visitors in that 1) they

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Figure 6. The search field page of the Australian Heritage Database http://www.environment.gov.au/cgi-bin/ahdb/search.pl

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Figure 7. Photographs captured from different angles shown as a result of heritage search and Description of the searched heritage in several lines of text http://www.environment.gov.au/cgi-bin/ahdb/search.pl

have been permitted to use 3D cultural-heritage data for free since 10 January, 2019, and 2) they can obtain detailed information through the artefact search process including audio guidance based on four languages, images, videos, floor plans, and relevant survey and research data. In addition, different types of visualisation methods are applied in this portal to effectively arrange descriptions, tables, images, electronic cultural maps, floor plans, videos, narrations, reference data, links, etc. at the appropriate locations.

3) Australian Heritage Database

The Australian Heritage Database contains information on over 20,000 subjects related to nature,



Figure 8. Data arranged to enable visitors to access data according to collections https://www.europeana.eu/en/collections

history, and indigenous sites. This database also includes information on places indicated on various lists (UNESCO's World Heritage Sites, Australia's heritage attributes, heritage attributes of the Commonwealth of Nations, and historically significant international sites for Australia), those on the register of state-owned attributes, and those that are being reviewed or may have been reviewed to be indicated on one of the aforementioned lists.

This DB implements a general search method that displays results based on contents input in each field. It also provides the function of advanced search, which enables users to search the list of local sites based on the search of local governments and perform the search process by using the information on latitude, longitude, and maps. However, this DB has the following limitations. First, users should search content on cultural heritage attributes of Australia and the Commonwealth of Nations in a simple search environment in the form of a general website. Second, this DB shows a low level of readability because it is not visualised.

4) Europeana functioning as Europe's cultural heritage DB

Europeana presents millions of cultural heritage data provided by numerous organisations located across Europe. The operator of this platform does not perform independent tasks with the cooperating organisations. Its counting partner network thoroughly verifies the collected data. This platform continuously applies additional information on geographical location and relevant individuals, location, and subjects to increase the data quality.

It holds collections of heritage based on diverse subjects including archaeology, arts, fashion, industrial heritage, books, maps, migration, music, newspaper, photos, sports, and the First World War.



Figure 9. A direct link for the corresponding attribute page provided at the bottom of the data

https://www.europeana.eu/en/collections

Good to know All metadata Location	
Providing institution	Istituto Luce - Cinecittà 🗹
Type of object	Photograph; http://vocab.getty.edu/aat/300046300
Provider	The European Film Gateway
Rights statement for the media in this item (unless otherwise specified)	http://rightsstatements.org/vocab/InC/1.0/
User generated content	false
Rights	Istituto Luce - Cinecittà, All rights reserved
Creation date	14.01.1956
Places	Selatin dry plate process : Italy : gelatin dry plate process : Italy : Italy
Identifier	VedolL0000002015-gen1 ; VedolL0000002015-gen1
is part of	Europeana XX: Century of Change
Providing country	italy
Collection name	08602 EFG Instituto Luce Cinecitta
Timestamp created	2020-11-22T21:25:10.106Z
Timestamp updated	2022-04-13T07:48:20.507Z

Figure 10. Metadata for searched information https://www.europeana.eu/en/collections

when they search for "cats". Then, they can use the filter function to obtain only results on "cats in art from Sweden".

It targets teachers who develop teaching materials, developers who use open-source application programming interface (API), and cultural heritage enthusiasts who take pleasure in creating image files on cultural heritage in the graphics interchange format (GIF) and in conveying relevant stories.

The entire digital data on Europeana include direct links. Users can move to the corresponding page and learn the necessary data in detail by clicking the attribute button of the target data located at the right bottom.

When users are informed r e g a r d i n g d e t a i l e d information on the items that they are willing to search for, they can use the advanced search function to derive segmented search results. They can also use the filter located at the top of the search result page to filter results according to specific standards such as collections, media types, and nations. For example, Europeana would show various results

II. Use of Digital Curation and Heritage Data

1. Concept and background of digital curation

Curation refers to the activities of selecting, preserving, maintaining, collecting, and archiving digital assets. Previously, archivists used to simply think of curation as the long-term preservation of data or digital information, but scientists considered it from the perspective of data visualization, annotation processing, and conceptualization of data. This approach goes beyond archiving data and providing information to providing customized information by intelligent retrieval of information and understanding data correlation. Digital curation follows the latter approach and has a forward-looking nature in terms of data management. However, a study has pointed out that the existing curators' activities are a passive form of how to display materials, arguing that digital curation is an active and potentially interactive process.

The existing ways of digital preservation and digital archiving are sometimes used interchangeably with digital curation. Digital archiving is a concept to achieve the purpose of digital curation, and digital curation can be seen as an umbrella concept of the other two concepts. The term 'digital curation' first appeared at the 'Digital Curation: digital archives, libraries and e-science seminar' held in London in October 2001. Digital curation is the process of establishing and developing a long-term repository of digital resources for current and future reference by researchers, scientists, and historians. This definition includes not only the process of digital archiving and preservation but also all the processes necessary for producing and managing high-quality data and the ability to add new value to data to produce new information and knowledge sources.

Digital curation, defined by the Digital Curation Center (DCC), refers to 'maintaining, preserving, and adding value throughout the life cycle of digital research data'. In the UK alone, around £3 billion of public money is invested annually in research of digital curation, but the available research data are not well represented. We would need institutions to nurture skilled digital curators as well as properly manage the curation lifecycle to make the most of the generated research data.

2. Necessity of digital curation

Born-digital content has increased exponentially. It is produced in the digital form from the beginning. These digital objects are classified mainly into individual objects (e.g. text, image, and sound files) and complex objects (e.g. websites and DBs). A constant increase in digital records has highlighted the need for museums to implement digital curation. It is a new method for preserving, managing, and using content produced in a digital environment.

The purpose of digital curation is to efficiently provide customised information for both curators and the audience. Digital curation services have been conducted limitedly, as shown in the cases of Europeana, the e-Museum of the National Museum of Korea, and the National Cultural Heritage Portal. However, these services cannot 1) ensure the sustainability of the digital heritage owing to the failure in reflecting the characteristics of heritage data, or 2) effectively deliver the socio-cultural context of heritage attributes

and a semantic relationship of heritage data owing to data disconnection.

UNESCO's Charter on the Preservation of Digital Heritage defines the purpose of preserving digital heritage as follows:

The purpose of preserving the digital heritage is to ensure that it remains accessible to the public. Accordingly, access to digital heritage materials, especially those in the public domain, should be free of unreasonable restrictions. At the same time, sensitive and personal information should be protected from any form of intrusion.

- UNESCO, Article 2 of $\ensuremath{{}^{\star{l}}}$ the Charter on the Preservation of the Digital Heritage_

Various approaches to the preservation of digital heritage are adopted to provide equal and effective opportunities for those willing to access and use digital heritage. Effective digital curation services can support and facilitate both curators and the public. Curators can use these services to identify a relationship between artefacts with time efficiency and data accuracy for research or exhibitions on cultural heritage. These services also enable the audience to receive accurate information by selecting their preferred heritage information.

3. Use of heritage data

Advances in digital technology have helped heritage-related organizations, such as archives, libraries, and museums, digitize and make data collections more accessible. Over the past few years, various approaches have been developed to enable the visualization of cultural heritage data. A study [8] presented use cases for annotation, linking, visualization, and browsing of cultural heritage data and suggested several directions to achieve visual analysis. It also aimed to improve the user search experience for cultural heritage by understanding the user's search context and providing quick access to relevant information [8].

Another study [9] summarized previous studies related to the visualization of cultural heritage collection data and classified and investigated them according to the imaging technique. Consequently, visualization methods for temporal data were studied in 2D format, and lists and slideshows were used for non-temporal data [9].

Temporal data visualisation, hierarchical data visualisation, network data visualisation, and geospatial data visualisation are the most frequently used data visualisation techniques. Temporal data visualisation is used to show one-dimensional linear objects such as line graphs, line charts, or timelines. For example, a line chart displays variations that occur continuously during a set period. Multiple lines in a line chart indicate variations in different elements during a period. Hierarchical data visualisation is used to show a group or set of items that include a common link with the upper item. An information cluster can be displayed based on a data tree. For example, the number of inventory data can be indicated as a tree consisting of the upper node (e.g. clothing) and lower nodes (e.g. shirts, trousers, and socks). Network data visualisation is an effective technique for showing a complex relationship among relevant data of different



Figure 11. Example of temporal data visualisation https://humansofdata.atlan.com/2016/11/visualisingtime-series-data/



Figure 13. Example of network data visualisation https://library.unc.edu/data/network-visualisation/



Figure 12. Example of hierarchical data visualisation https://exploratory.io/note/BWz1Bar4JF/How-to-createa-Treemap-in-Exploratory-uMS0CNW3rZ



Figure 14. Example of geospatial data visualisation https://www.anychart.com/blog/2018/11/20/datavisualisation-definition-history-examples/

types. Its examples include a scatter plot that represents data based on dots, bubble chart that adds the third data element to a scatter plot, and word cloud that indicates word frequency by using words of different sizes. Geospatial data visualisation is used to generate heat maps, density maps, map diagrams, etc., which indicate data related to the actual location of the target. For example, this technique can be applied to display the number of customers who visit retail shops according to each shop.

It is crucial to effectively display information on the relationship between cultural heritage attributees in the process of using cultural heritage data. Regardless of the field, the priority of data use is to enable the end-users to access the desired information rapidly and conveniently. Accordingly, the purpose of using cultural heritage contents visualised by visualisation tools is to support users to identify a semantic relationship among such attributes rapidly and conveniently. That is, users of cultural heritage contents are induced to connect even the secondary and tertiary relationships among artefacts beyond the primary semantic relationship among these, visualise these connections, and obtain new knowledge and information based on these connections.



Figure 15. Overall design of the Museum of the World https://britishmuseum.withgoogle.com/



Figure 16. Descriptions and relationships of artefacts displayed when a certain artefact is clicked https://britishmuseum.withgoogle.com/

ISLAMIC MIDDLE EAST | DINAR OF ABDALLAH AL-MUSTA'SIM



Abdallah al-Musta'isin (reigned 1242-58) was the last Abbasid calipit on Iude in Baghada the Empire's capital. An incompetent and weak figure, who refused to recognize the Mongol threat, he was put to death by Hulega, the Mongol conqueror of the Islamic lands following his sack of Baghada in 1258. The Abbasid line of caliphs in Baghada that had begun with alsiaha in AD 750 had come to an end.

his gold dinar coin is striking for its beautifully ecuted Kufic script, in which the terminals of the tters are ornamented with swirling intertwined wing lines – typical of ancient islamic art and lown as anabesques.



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Figure 17. A window that displays detailed information on the selected artefact

https://britishmuseum.withgoogle.com/

4. Cases of heritage data use

1) British Museum, 'The Museum of the World'

The Museum of the World is a service provided by the British Museum. It presents artefacts possessed by this museum in a visual form according to time and location. This platform displays artefacts in chronological order based on

the present point, and categorizes these according to the continents where these were located (i.e. Africa, America, Asia, Europe, and Oceania).

Each continent is represented by specific colours to help users distinguish continents conveniently. Each artefact is indicated as a point of the corresponding representative colour on a timeline. A notable feature of the Museum of the World is that it also presents the artefacts (which belong to groups of certain regions and periods) according to various themes such as art and design, living and dying, power and identity, religion and belief, and trade and conflict.

A small pop-up window appears when the user clicks a point. It shows the name and image of the artefact corresponding to the clicked point. The Museum of the World was designed to connect related artefacts with lines to enable users to obtain additional information conveniently.

Users can obtain more detailed information than a description indicated in the small pop-up window by clicking the FIND OUT MORE icon. The interface of the page connected to this icon is designed to provide explanatory text for the target artefact, an audio file for the text, information on the original of the target artefact and relevant artefacts, and functions to share such information on social media and the Web.

The Museum of the World instantaneously captures the attention of users based on its advanced design that highlights a perspective of space. However, it has inconvenient aspects. For example, users cannot immediately identify information on a certain artefact unless they click each artefact represented as points. They may also find it difficult to click a certain point when points are clustered in 3D space. Moreover, this platform presents artefacts according to time, location, and five themes. Numerous artefacts have been created in the long human history ranging from 2,000,000 BC to the modern era. Therefore, the classification of artefacts belonging to five continents, according to five themes can help users observe these artefacts conveniently. However, this interface may exhibit comparatively low accuracy in the process of representing the characteristics of each artefact and the relationships among these artefacts.

Furthermore, this platform presents information on the artefact selected by the user, such as a description, an audio service, the origin of the target artefact, and the list of relevant artefacts.



Figure 18. The collection of intangible cultural heritage attributes





Figure 19. Heritage attributes related to costume



Figure 20. The potentially related World Heritage sites Figure 21. Regions https://ich.unesco.org/en/dive&display=constellation#tabs

Nevertheless, users cannot obtain detailed information on the target artefact because of insufficient metadata that can help the user conveniently identify the features of each artefact. In this regard, the British Museum should apply additional metadata of basic information on artefacts (such as the period when the artefact was created, its type, and its creator) to this platform by priority. In addition, it should update information on the numbers of the artefacts possessed and managed by the British Museum, relevant administrative information, and information necessary for subsequent data management.

Non-experts interested in artefacts possessed by the British Museum can satisfy their interest by obtaining brief information on these on the present interface of the Museum of the World. However, experts are unlikely to obtain detailed information on and insight into artefacts (which can be used for research) on this platform. In this regard, this platform should be enhanced in terms of search-related functions to be used effectively for research and academic purposes. It should also be combined with a user experience design that displays search results in the form desired by users.

2) UNESCO, 'Dive into Intangible Cultural Heritage'

Dive into Intangible Cultural Heritage is a collection of intangible cultural heritage attribute provided



Figure 22. Description of Yeongsanjae, the UNESCO intangible cultural heritage, a relevant video, and a hyperlink

https://ich.unesco.org/en/dive

on UNESCO's Intangible Cultural Heritage website. It presents relevant concepts based on keywords in the visualised form. Each concept is represented by specific colours, and the size of each concept increases in proportion to the frequency of relationships. With regard to the representation method, users can click keywords that appear in circles to narrow the range of keywords and ultimately reach individual cultural heritage attributes. The images of these cultural heritage attributes are presented in circles. The name of the target appears in a box when the user places a mouse cursor on the image of the target.

This webpage also shows diamond-shaped and hexagonal points apart from circular ones. A green hexagonal point indicates a wide region, and a green diamond-shaped point indicates a country. A black diamond-shaped point refers to the potentially related World Heritage site.

When the user clicks the + button located below a circle filled with an image, a pop-up window including information on the target cultural heritage appears. This page provides an explanatory text for the target cultural heritage, relevant images and videos, and a hyperlink that is connected to the UNESCO website.

When users click an icon located at the bottom of the pop-up window, they can examine visualisation data rearranged based on keywords, such as Sustainable Development Goals (SDGs; these are directed by the UN), Domains, Biomes, and Threats.

Because users can search visualised data of the UNESCO intangible cultural heritage and perform relevant tasks on a single screen with the Dive into Intangible Cultural Heritage interface, they can



Figure 23. Domains





Figure 24. Biomes



Figure 25. SDGs https://ich.unesco.org/dive/domain/?filter=186

Figure 26. Threats

intuitively identify relationships and characteristics of intangible cultural heritage attributes. However, this interface has several problems. For example, when users search information using only the mouse-clicking function, they should click each icon sequentially numerous times to reach the desired information because of the large amount of data provided by this interactive space. Users can directly input a keyword and search information based on it by clicking the magnifier icon located at the top left of the interface. However, this search function indicates only the location of the searched result. Because cultural heritage attributes or keywords are widely distributed on this screen, users may be bewildered by the disorderly arrangement of the searched result and relevant information.

In addition, various concepts are visualised based on convenient words such as DANCE, CATTLE, and

SUGAR in this space. However, users can also be confounded by a distribution of excessive keywords and the marking of keywords and individual cultural heritage attributes in the same space. To solve these problems, keywords should be classified into the upper concepts and lower concepts to apply a more structured visualisation to the Dive into Intangible Cultural Heritage interface.

III. Development of Training Programmes on Data Management and Application

1. Necessity of programme development

1) Need for constant monitoring of changing technology

Significant data loss can be caused by a high dependence on software and hardware and on deteriorated equipment and facilities. In this regard, constant training should be provided to workers responsible for archival data management to help them conveniently adapt to the trend of rapidly changing technology.

The National Archives of Korea conducted a survey based on 472 workers responsible for archival data management. They reported that 83.4% of the respondents agreed on the necessity of re-training data management experts. The survey also asked respondents to indicate the field that required the re-training of experts and necessary re-training content. The survey result showed that the highest proportion (38 individuals) of the respondents required the development of a re-training programme on electronic archive management associated with the Fourth Industrial Revolution, new computer systems, etc. The second highest proportion (18 individuals) of the respondents required the development systems required the development of a re-training programme on new technology and relevant issues and trends associated with an exchange of information on trends of electronic and non-electronic archive preservation technology, transformation caused by new technology development, etc. The results also indicated a high demand for technical training in DB management, by workers responsible for archival data management.

The survey also investigated the opinions of respondents with regard to the main problems with the current conditions of archiving experts. The survey results indicated that the existing short-term training provided for archiving experts has failed to achieve the ultimate training objective of nurturing archive management experts. This has occurred owing to the absence of both standards for effective talent and long-term training strategies with specific training targets and training objectives. Accordingly, the survey results indicated the deficiency of training content for continuously increasing the expertise of workers responsible for archival data management.

2)Need for establishing data management systems and nurturing experts from the longterm perspective

The necessity of digital archiving is emphasised in various fields including cultural heritage, visual

arts, and intangible cultural heritage. Accordingly, long-term digital archive management should be implemented. To facilitate digital data collection and management, digital data management experts with special knowledge in their fields should be nurtured.

There are various types of digital archival data. These range from text records (including simple text, documents, notes, and reports), to sound- and video-based records. Hence, digital data should be classified systematically according to data characteristics to facilitate long-term digital data preservation. Moreover, a measure should be developed to evaluate different types of metadata and re-establish metadata in an integrated manner in the process of collecting distributed data. In addition, a long-term masterplan should be executed and managed to perform the aforementioned tasks continuously.

3) Need for an environment that induces user participation for establishing an ontologybased digital archive

Cultural heritage contributes to passing down the products of the times to the next generation. The range of cultural heritage is considerably wide.

Shilton and Srinivasan stated that the main collection institutions have established an archive 'about' communities, rather than 'of' communities. In particular, they criticised that archivists produced decontextualised objects that represent the original, by applying the theories and techniques of others. They also emphasised the necessity of narratives connecting collected data and of the participation of community members to preserve contextual knowledge. (Shilton and Srinivasan 2007: 90) Virtual Georgia permits both archivists and general users to upload records created or possessed by them by completing elements of metadata indicated by this website. Workers in charge of digital archiving for this website evaluate the uploaded records and reveal the approved records to the public. Virtual Georgia provides an environment where users can participate in archiving. As shown in the case of Virtual Georgia, an archiving system reflecting the perspective of the user should be developed to prepare an environment where users can actively participate in the establishment of archives and reproduction of contents.

Digital archiving has been conducted at the level of the collection of an enormous amount of distributed data. To elevate the digital archiving system to an advanced level, archive management institutions should establish an environment where users can perform tasks as archivists. To achieve this, these institutions should develop a user experience design that enables users to access data based on desired keywords, data use measures for creating content, and a metadata management system for controlling data input by users. Accordingly, these institutions should continuously provide users with information on digital archiving and nurture experts who can design and develop various types of archiving content that promote the direct participation of users in archiving.

2. Overview and schedule of the proposed programme

The International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM) is an organisation that has held conferences and training programmes on digital heritage. It is the most active organization in this field at present. The ICCROM has also implemented a project on preserving

Date	Title	Theoretical training	Practical training
Day 1	Data Generation and Selection	Concept and significance of digital heritage Necessity of digital curation Metadata of heritage	Team building Conceptualisation Metadata design
Day 2	Data Collection and Preservation	Types and formats of heritage data Long-term heritage data preservation strategies	Website search and data download Classification of images according to folders Formation of an Excel file
Day 3	Data Use 1	Concept of ontology	Practical ontology design training
Day 4	Data Use 2	User experience design Interface design	Content design for digital curation
Day 5	Data Use 3	Virtual exhibition planning and composition	Planning of virtual and kiosk-based exhibitions

<table 1=""> Detailed schedule and contents for the proposed training programme (pl</table>	an)
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recorded voices and images as part of the Sustaining Digital Heritage program. This organisation has discussed regularly with content creators, archive owners, educators, curators, collectors, etc. for the project's success.

It is estimated that 463 EB of data would be generated daily in the world by 2025. This is equivalent to approximately 210 million DVDs per day. Although the entire data are unlikely to be converted to digital heritage data, the ICCROM has undertaken efforts to develop strategies for preserving digital heritage and using such data creatively in the forthcoming massive data preservation market.

To achieve this, this organisation has conducted projects and seminars based on a wide range of themes. These invite scholars and workers in the digital-heritage field worldwide. The Digital Imperative: Envisioning the Path to Sustaining Our Collective Digital Heritage is the ICCROM's main project executed in 2021 to develop a proposal for a programme (tentatively called Sustaining Digital Heritage) that may help address deficiencies in existing opportunities for capacity development of experts responsible for tasks on Sustaining Digital Heritage. This organisation conducted interviews with over 30 heritage professionals worldwide to learn directly from practitioners. Herein, each interviewee was asked to share his/her opinions on the following questions: What is digital heritage? What does sustaining digital heritage imply? What challenges do they encounter in relation to sustaining digital heritage? What skills and capacities are required to sustain digital heritage?

This study intended to develop a mid-term digital heritage training programme that is more practical and specific than existing digital heritage training programmes. This can contribute to sustainable digitalheritage use. To ensure the sustainability of digital heritage curation, workers responsible for digital heritage curation in organisations should improve their capabilities for independently analysing and performing digital curation tasks that tend to be conducted by external experts or a few IT professionals in their organisations. Therefore, this study proposed a training programme on data management and use to enhance the capabilities of cultural heritage managers for digital curation. The proposed programme consists of theoretical and practical training contents that can help cultural heritage managers learn the characteristics of heritage data as digital heritage and perform tasks of creating, selecting, collecting, preserving, storing, and using heritage data. This programme targets heritage managers including museum curators, record administrators, preservation practitioners, and data managers. 20–25 individuals are permitted to participate in each training session. The proposed programme is designed to be conducted for five days biennially. The following is an overview of the training curriculum.

Training objectives Training contents Day 1: Data Generation and Selection (120 mins) Introducing the contents and purposes of the 1) Opening address proposed programme Beginning 30 2) Team building Self-introduction by participants, and teambuilding among them 1) Concept and significance of digital heritage Development 2) Necessity of digital curation 80 3) Metadata of heritage Cleaning the surrounding environment and Completion 1) Closing 10 completing the training session Day 2: Data Collection and Preservation (180 mins) 1) Recognition of the concept and Learning the concept, definition, processes, and processes of data generation, methods of data generation and selection selection, and preservation Learning and identifying the concept and processes of data collection and preservation Beginning 30 Learning the types and formats of heritage data Learning long-term heritage data preservation strategies 2) Metadata Learning the definition and role of metadata 1) Selection of artefacts Performing concept design for visualising information on artefacts by using artefact search services operated by museums and web portals such as Naver and Google, searching for necessary information, and downloading relevant data Collecting images and classifying the collected images according to folders 2) Generation of metadata and Generating metadata by forming a list (in MS the list of artefacts Excel) of information on artefacts, such as names, Development 120 numbers, nations of origin, periods of creation, purposes of use, functions, size, and relevant contents 3) Categorisation of data Learning the definition of ontology Categorising the target resources based on classes, applying attributes to objects included in each class, and describing the relationships among the objects

3. Detailed plans for the proposed training programme

Stages	Training objectives	Training contents	Duration (mins)
Finishing	 Exchange of information on the cases of data collection and preservation that should be performed by the organisations to which the participants belong Completion of training 	Exchanging opinions on measures for applying the knowledge obtained in the proposed training programme to the organisations to which the participants belong, through team-based discussions Cleaning the surrounding environment and	30
	Day 3: D	ata Use 1 (180 mins)	
Beginning	 Identification of the concept and necessity of data use Concept of ontology 	Learning the concept of data use and identifying its necessity Learning the definition of ontology Learning ontology cases	30
	1) Exploration of ontology instances	Learning the exploration of ontology instances and the design of classes, attributes, and relationships	60
Development	2) Practical ontology design	Learning the Ontology Web Language (OWL) Representing an ontology graph using Protégé, an ontology design tool	60
Completion	 Exchange of opinions on the cases of data selection that should be implemented by the organisations to which the participants belong Completion of training 	Discussing measures for expanding ontologies and applying ontologies in the field Cleaning the surrounding environment and completing the training session	30
	Day 4: D	ata Use 2 (180 mins)	
Beginning	 Recognition of the concept and cases of cultural heritage data management Recognition of the concept and cases of cultural heritage data visualisation 	Learning the concepts of data management and visualisation Learning the cases of data management and visualisation	30
Development	 Practical use of cultural heritage data management tools - an artefact management programme - a data conversion programme 	Using a data conversion programme to complete the first task of loading an Excel file and converting the format of the data it contains, and the second task of loading a local image, converting the size of this image, and automatically uploading the converted image Inputting, editing, and deleting data of artefacts Examining photographs and files connected to the target artefact at a box located at the bottom of the	60

Stages	Training objectives	Training contents	Duration (mins)
	 2) Practical training to visualise information on artefacts - User experience design - Interface design 	Developing a design reflecting user-oriented experience and an interface to produce visualised contents that can effectively deliver information on artefacts	
Development		Visually expressing information on each artefact by adjusting the size of thumbnails of data (which were collected and arranged as a DB) to indicate the number of artefacts related to the target artefact, and by applying different colours to data according to tagged metadata	60
		Developing effective visualisation methods that can help users and visitors to conveniently identify a relationship among artefacts with similar attributes Designing an interface that helps users and visitors to conveniently identify a relationship among artefacts based on various functions such as the adjustment of the location of lower attributes and artefacts, variation of line colours, and emphasis of information on the selected artefact	
Completion	1) Exchange of opinions on the cases of data use methods that should be implemented by the organisations to which the participants belong	Exchanging opinions on measures for applying the knowledge obtained in the proposed training programme to the organisations to which the participants belong, through team-based discussions Cleaning the surrounding environment and	30
	Day 5: D	ata Use 3 (180 mins)	
Beginning	1)Analysis of the concept and cases of virtual exhibition	Learning the concept and cases of virtual exhibition	30
	1) Planning and composition of virtual exhibition	Presenting results derived on Day 4 on a kiosk	60
Development	2)Establishment of an enhancement direction based on the result of a user test	Evaluating the results based on a user test and setting an enhancement direction	60
Completion	 Closing address Cleaning of the surrounding environment and completion of the training session 		30

Appendix

< Appendix 1 - Cultural heritage data management teaching plan >

This appendix will be used in the process of 'Data Collection' on Day 3 and 'Data Preservation and Storage' on Day 4 of the previously developed heritage data management and utilisation training programme for heritage managers. It is used as an example of how to design metadata according to the characteristics of data to be utilised and programme development to utilise collected and organized data.

1) Arrange Metadata in Excel

First of all, in order to enter the information of the objects to be visualised into a database, the metadata of the recommended collections provided by the e-Museum of the National Museum of Korea was organized in spreadsheets. Each metadata was categorized into 'artefact type', 'curation theme', 'artefact name', 'artefact name (in Korean)', 'artefact description', 'other names', 'nationality/era', 'classification', 'material', 'artist', 'size', 'designated cultural heritage', 'collection number', and 'e-Museum link'. The metadata of a total of 549 artefacts was sorted, and curation themes without artefacts were removed in the process. Afterwards, folders were created for each sub-attribute of each condition, and individual folders were created in each sub-attribute folder. Each folder has photographs of the artefacts.

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Appendix1-figure 1. Metadata spreadsheet of artefacts from the e-Museum of the National Museum of Korea

2) How to Use a Data Converter Programme

To visualize the organized data, the 'artefact management programme' and 'data converter programme' were developed as data management tools. These two programmes used Visual Basic. NET to create applications for Windows. A data converter programme was used to read the Excel file and convert the data format. The size of the local image data was converted and automatically uploaded.

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Appendix1-figure 2. A spreadsheet imported through a data converter programme

3) How to Use Artefact Management Programme

In the artefact management programme, information on sub-attributes and artefacts can be modified or deleted. Users can add or modify content by clicking the buttons of 'Artefact Management', 'Type Management', 'Theme Management', 'Nationality/Era Management', 'Classification Management', and 'Material Management' at the top left of the programme. <Appendix 1-fig. 3> shows the screen that appears when material management is selected. Users can check sub-attributes related to materials such as 'metal', 'fabric', and 'paper' and see the total number of materials and codes assigned to each sub-attribute.

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When you click the artefact management icon, you can directly input artefact data through the input box at the top left, and you can also edit or delete it. On the far left of the screen, empty slots are listed where users can enter the attributes of artefacts used when creating a spreadsheet. When selecting 'Search', users can check the list created as sub-attributes of the artefacts and select one. In the box located at the bottom of the screen, users can see the list of photos and files associated with the artefact.

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Appendix 1-figure 4. Management page of the artefact management programme

Appendix

< Appendix 2 – Cutural Heritage Data Utilisation Teaching Plan >

This appendix will be used during the 'Data Utilisation' training on the day 5 of the previously developed heritage data management and utilisation training programme for heritage managers. Use the collected data as an example of data visualization that can be effectively communicated.

1) User experience design

User experience (UX) must be designed so that users can effectively obtain visualization information. It is important to configure the user flow as simply as possible so that users can quickly and easily access the information they want. The intelligent curation developed by KNUCH is explained as an example.

On the left side of the intelligent curation web page, five types of artefact relationship conditions are presented in the form of a checkbox so that users can select the artefact relationship conditions. Users can check the visualized artefact information on the right side of the page by clicking 'Create

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Relation Network' after selecting an artefact relationship condition. Each artefact and sub-attribute is represented by a circular shape. Sub-attributes appear as text, and photos appear as thumbnails.

Appendix 2-figure 1. Visualization when choosing an 'artefact classification'

When users click on each artefact, a photo linked to the thumbnail and a summary about the artefact appear in a pop-up <Appendix 2-fig. 2>. When selecting the 'View Details' icon in the pop-up, users can see more detailed information <Appendix 2-fig. 3>. The name of the artefact appears at the top, and the title of the curation created by the curator and the name of the curator is displayed at the bottom. In the main text, users can see the description provided by a curator at the National Museum of Korea and information and photos of related artefacts.



Left : Appendix 2- figure 2. A summary about the artefact ; Right : Appendix 2-figuer 3. Curation about the related artefacts

Users can search for the artefact they want to explore. First, users can enter the name of the artefact in the search box after selecting the conditions related to the artefact they want to find out. If users click the 'Search' button after entering an artefact name, they will be directed to a page with the artefact or attribute, and then the information related to the searched word will be highlighted and displayed. Through this,



Appendix 2-figure 4. Visualization of the location of the artefact by highlighting when searching for 'Sangpyeong Tongbo (a copper coin)'

Within one condition, each sub-attribute has a designated colour, and each artefact is connected by a line of that colour. In the sub-attributes, the larger the number of related artefacts, the larger the circle size, and the smaller the number of related artefacts, the smaller the size. As in the example of <Appendix 2-fig. 5>, when the condition of 'nationality/era' is selected, the size of the circle of 'Joseon' is the largest as it has the most related artefacts.





2) User Interface Design

The user interface also aims to make it easy to reach the desired information with an intuitive design. Design elements such as the size, font, and color of the icon and arrangement correspond to this. This also explains the intelligent curation developed by the KNUCH as an example, focusing on the visualization of information on the relationship between artefacts.

On the intelligent curation website, users can understand relations between artefacts by selecting multiple artefact relationship conditions. When two or more conditions are selected, various subattributes connected to one artefact are shown, and the principle of gravity is used so that related things can be located close to each other. As shown in <Appendix 2-fig. 6>, when 'artefact type' and 'artefact classification' are selected, the sub-attributes of 'artefact classification' appear in the form of a circle on the left side of the screen, and the sub-attributes of 'artefact type' also appear in a circle on the right. In addition, related artefacts are grouped together.



Appendix 2-figure 6. Visualization when multiple conditions ('artefact type' and 'artefact classification') are selected.

When multiple conditions are selected, the edge of a circle with artefacts connected to two or more sub-attributes is set to the colour of the sub-attribute which has a large number of connected artefacts. Gradient change is applied to the colour of the line. For example, <Appendix 2-fig. 7> shows that 'Gyuhwa Myeongseon' is connected to 'culture and art (blue)' in 'artefact classification' and 'middle and early modern period (yellow)' in 'artefact type'. The number of artefacts connected to 'culture and art' is greater; thus, the yellow line that started from 'middle and early modern times' changes to blue.



Appendix 2-figure 7. Line colour of 'Gyuhwa Myeongseon' changes from yellow to blue

When hovering the mouse over a thumbnail that a user wants to learn about, only the related artefacts and attributes are highlighted <Appendix 2-fig 8>. For users to easily grasp the relationship visually, unrelated artefacts are greyed out to create contrast. If a user clicks the artefact after hovering over it, the edge of the artefact gets thicker and fixed. Even after a mouseleave, the position can be confirmed through the thickness of the edge.



Appendix 2-figure 8. Visualized when hovering a mouse over 'Celadon Pedestal'

<Appendix 2-fig. 9> is how it looks when the attribute is selected. After selecting the conditions for 'curation theme' and 'artefact classification', this image is displayed when hovering a mouse over and

clicking 'conservation science', a sub-attribute of 'artefact classification'. Users can check the location of artefacts (circle) connected to 'conservation science' and see the location and number of related curation themes (black rhombus). Users can see the visualization and go to several curation themes under 'conservation science' to understand the relationship and context between artefacts.



Appendix 2-figure 9. Visualization of related themes and related artefacts when selecting the 'Traditional Science' attribute

<Appendix 2-fig. 10> shows how it looks when clicking after hovering the mouse over one of the curation themes (black rhombus). Users can guess that the selected themes 'Creator God Bok-Hui and Yeo-Hwa — keywords to understand the funeral culture of Turpan Gochang-Guk' — are mainly related to 'culture and art' and 'social life'; they can also see the 4 artefacts related to this.



Appendix 2-figure 10. A visualization that shows the selected theme is related to 'culture and art' and 'social life'

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Visitor Journey Mapping: New Understanding of Youth Cultural Heritage Experience

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Abstract

The focus of designing cultural heritage experiences heavily emphasizes on-site experiences. While on-site experiences are important, experiences with the heritage from external sources before and after the visit should also be addressed. The youth's interest, understanding, and appreciation of heritage may come from sources beyond those provided by the heritage authority. Technologically savvy youths are more connected to the virtual social space than their physical surrounding. Thus, it is crucial to understand the effects of various touchpoints, offline and online, on youths' interest, understanding, and appreciation of heritage. This study generates a new understanding of the youth heritage experience, considering all heritage touc hpoints. The research settings are George Town and the Lenggong Valley UNESCO World Heritage Sites. The study utilizes the visitor journey mapping approach, focus group discussions, and participant observations. Data were collected from 39 participants, aged 15-24 years. The participants visited the heritage sites to develop their visitor journey map, documenting their experiences before, during, and after the visit. Two weeks after the visit, they participated in focus group discussions. The data from their journey maps, discussions, and observations were used to categorize and explain the touchpoints for the youth heritage experience and their meaning-making regarding the cultural heritage. The findings contribute toward designing an impactful cultural experience such that the youth will value and support efforts of heritage preservation and conservation.

I. Introduction

Designating cultural heritage sites as UNESCO's World Heritage Sites ensures that such sites are preserved and conserved for the current and future generations, extending their legacy and inspiration (https://whc.unesco.org/en/about/). Thus, among the key imperatives of UNESCO heritage sites is to offer experiences that encourage support for the preservation and conservation of the heritage.

The youth is the lifeline for the continuity of our cultural heritage. Encouraging their appreciation of the cultural heritage has significant social, economic, scientific, and educational value because it may cultivate national pride (Strahilov, 2021), instill a sense of social belonging (Khanna et al., 2018), and affirm life beliefs (Holtorf et al., 2018). However, in today's age of connectivity, youths are more connected to technology and the virtual space than their physical surrounding. For them, nothing is real unless they are on the Internet and social media. As such, engaging the youth cognitively and emotionally has become increasingly challenging. Therefore, it is vital to understand how to create impactful and meaningful cultural experiences among the youth within the contemporary environment and media influences. While the focus in designing cultural experience has been visitor experience at the physical sites and the interpretation provided by management at the site, understanding youth experience should arguably be extended to their experience before and after the visits to the site, particularly their activities on the Internet and their social network.

This research approaches the visitor experience from a contemporary integrated marketing communication perspective, where understanding the experience of visitors should include all their encounters or touchpoints with the heritage. Touchpoint in integrated marketing communication is any form of encounter a visitor has with the heritage, including physical, virtual, and managerial encounters (e.g., users and friends online). Adapting the customer journey map approach in marketing communication in tracking the touchpoints helps map the entire journey of the youth heritage experience. Thus, in this study, visitor journey maps are constructed to document the youths' journey in experiencing the heritage and delineate how the touchpoints with the heritage contribute to their whole experience. This research is novel in that it considers the visitor experience of cultural heritage as a journey (i.e., before, during, and after visits) from a holistic perspective and identifies key touchpoints in the journey. From the media effects perspective, this study contributes insight into the effects of the touchpoints on the youth's interest, understanding, and appreciation of heritage. Moreover, unlike most prior studies that use solely the journey mapping approach to reveal the touchpoints, this study combined journey mapping and focus group discussions, which proved to be superior.

The study generates new and more comprehensive insight into designing impactful and meaningful heritage experiences for the young generations at the heritage sites and beyond. These insights from the Visitor Journey Maps provide specific areas of focus for improvements. As an exploratory study, this research focuses on two UNESCO World Heritage Sites in Malaysia: Melaka and George Town, Historic Cities of the Straits of Malacca (https://whc.unesco.org/en/list/1223) and the Archaeological Heritage of Lenggong Valley (https://whc.unesco.org/en/list/1396).

II. Experiencing Cultural Heritage: A New Era

Experiencing cultural heritage is important in many ways. First, it allows us to re-live past experiences and take a historical perspective on the human condition (Kelly & Thomas, 2012). Learning from the lived experience of prior generations can help avoid past mistakes and capitalize upon past successes. Second, experiencing cultural heritage provides a window into how humans have lived in the past and how it translates into how we live and who we are today (Kelly & Thomas, 2012). It can induce a better understanding of the continuity of human conditions and what underscores the progress of culture. To some, relating to prior generations can induce a sense of belonging and identity (Holtorf, 2010). Third, experiencing heritage can encourage people to relate its meaning and seek answers to big questions and issues to critically assess present human conditions, thus inspiring new perspectives or ways of doing things (Holtorf, 2010).

The key to designing meaningful and impactful cultural heritage experiences is in making the past relevant to contemporary society (Shuhaida, 2018). However, in today's society, where much time is spent connected to the virtual world with other humans and artificial intelligence, the narrative of the distant past has become increasingly remote and challenging to relate to. Thus, the interpretation of heritage and presentation of heritage narratives must be designed in ways that are cognitively and emotionally accessible to the current generation. Much of the interpretation of cultural heritage relies on expert interpretations (e.g., archaeologists and state-sanctioned bodies), rich with historical and scientific data (Shuhaida, 2018). Beyond communicating historical and scientific facts, insight into how cultural heritage is embedded within human social life in the past and its contemporary society equivalent is warranted (Shuhaida, 2018). Hence, to truly appreciate heritage, visitors must make the connections between how people lived in the past and how we live today, reflecting on differences and similarities.

Moreover, experience is multidimensional; it includes sensory dimensions; spatiotemporal dimensions; cognitive, affective, and conative dimensions; and social dimensions that may come from various sources, including those beyond their encounters at the site and those offered by the heritage management. The sensory dimensions that are often of concern in designing heritage experiences and interpretation at the site include sight and sounds, with audiovisual technology such as three-dimensional and virtual reality technology used to make the heritage come alive for visitors. Indeed, such technologies are becoming essential given the youths' preference for audiovisuals over texts. With the youths' propensity for online media, as they are highly exposed to interesting creative content on social media such as Instagram, TikTok, and YouTube, presentations on heritage management websites should also reflect similar creativity. Additionally, youths today are highly social individuals, always sharing experiences and indulging in the experience of others. It will be interesting to understand their experiences with heritage on social media and how such experiences influence their interest, understanding, and appreciation. Beyond the audiovisual dimensions, other sensory experiences, such as touch, smell, and taste may also be evoked at heritage sights in designing the ambiance at the site. Heritage management should take the opportunity to leverage all five sensory experiences (e.g., touch, taste, and smell) because, as per Pine and Gilmore (2011), the more senses engaged, the more memorable and effective the experience.

The literature has also categorized different realms of experiences. The most prominent categorization

is the 4Es (Entertainment, Educational, Esthetics, and Escapist), proposed by Pine and Gilmore (2011), based on individuals' motivations and levels of participation. The entertainment experience is associated with absorption rather than immersion, education involves more active participation but is still not fully immersive, escapist experiences involve greater immersion, and esthetical experiences involve the greatest immersion (Pine and Gilmore, 2011). The richest experience was found to include all four realms of experience (Pine and Gilmore, 2011). The experiences to be offered to the customers (visitors) must be delivered effectively and meet their needs. Hence, in delivering the heritage experience to youths, it is vital to understand how the 4Es must be combined to meet their needs. For instance, youths seem to prefer or are highly exposed to content that is high in entertainment and escapist values. If these are their preferences, should heritage content be designed in similar forms?

Communicating Heritage, Social Media, and Youth

Communicating heritage regards the active mechanism to promote cultural exchanges. Communication is inherent in the dissemination of heritage to others across space and time. Solo-Anaeto and Jacobs (2015) explain that "culture and values are passed and kept alive from generation to generation through communication and socialization."

While, exhibitions, workshops, social media, knowledge sharing, and tourism education are the main mechanisms through which to promote cultural heritage (Mawuli, 2019; Sugiarti et al., 2019; Untari et al., 2020; Yang et al., 2018), the advent of the Internet has made the practice of using network resources to communicate cultural heritage becoming more important. Youths are experiencing more of their lives online than any generation before them, particularly through social media (Ronnie, 2016).

Youths today have grown up with the Internet, social media, and smartphones. They do not respond to traditional media like other groups and prefer user-generated content (UGC) (Ana, 2020). For example, millennials spend 5.4 hours per day engaging with UGC (Camilla, 2017). Moreover, millennials (86%) believe UGC is generally a good indicator of a brand, service, or product's quality (Cassidy, 2017). Such online endorsements or recommendations induced enhanced trust and higher purchase intentions among the online social network of peers and family (Wang et al., 2012). Further, 98% of millennials are more likely to engage with a friend's post over a brand post (Lexy, 2018). Similarly, youths are arguably more likely to be interested in UGC on heritage posted on social media by their peers than those posted by formal sources.

Social networks and the online environment are essential elements in the lives of youths (Eastman & Liu, 2012). As the shapers of Internet content, they are prone to sharing their lives and work online (Mafengwo, 2020). Prior studies show that millennials share a large variety of subjects on social media, led by politics and government (47%) and family and parenting (38%) (Chen, 2014). When millennials see interesting content, they are more likely than the general population to share it with their social networks (eMarketer, 2014). Through social media, users can upload photos, videos, music, images, and texts to share ideas, feelings, opinions, and experiences with other members, as social media enable communication and collaboration among individuals at a massive scale without geographical, time, and system constraints (Lai & Turban, 2008).

Stuedahl (2009) explains that social media and social networking have become a central focus in digital

cultural heritage communication, particularly regarding web 2.0, through blogs, wikis, Facebook, and YouTube. The character and technical features of such media show how different forms of participation can play a prominent role in cultural heritage communication. Cultural institutions use social media to raise awareness of cultural heritage issues to preserve and promote cultural heritage (Gaitán, 2014).

Social media has allowed for knowing places and collections previously challenging to reach because of their location, conservation problems, or availability for public view. New technologies have also allowed us to approach people and places without leaving our homes (Gaitán, 2014). Russo et al. (2008) in their study based on the use of a blog in communication between museum curators at Sydney Observatory claim that social media are expected to support online participation for co-creation and reflection on cultural heritage knowledge.

Social media promotes the dissemination of cultural heritage and can overcome the distance that may exist between the public and the institution (Liew, 2014). Stuedahl and Mörtberg (2012) note that "social media cannot substitute the embodied performance of [intangible cultural heritage (ICH)] practice, but can involve stakeholders from different communities and audiences in the revitalization of heritage by providing a space for communication, dialogue and negotiation. This [situation] requires an approach to the design of digital and social technologies that focuses on sustaining both the continuity and vital diversity of people's intangible heritage practices while taking into account the entanglements of online and offline technology in producing and reproducing embodied heritage knowledge." Pietrobruno (2013) notes that video-hosting websites, most notably YouTube, are enabling a relationship between official heritage and non-official archiving practices. YouTube as an archive of ICH can circulate practices of the marginalized and challenge traditional performances of heritage.

4. Customer [Visitor] Journey Map

Beyond the heritage interpretations and narratives at the heritage site, it is important to be more discerning of when, where, and how heritage is encountered. It is especially true for the young generation whose cultural experiences have hardly been lived without being mediated by Internet technology. Traditionally, heritage sites focus on on-site narrations or interpretations and physical experiences. However, visitors today are heavily reliant on the Internet in gaining, interpreting, and creating knowledge. A visit to a heritage site is inevitably preceded and followed by a visit to the Internet, engaging with the site on different platforms via sharing, reviewing, and content creation.

A customer journey map is a popular tool often used in marketing to trace every step of the journey that a customer makes in consuming a brand. It accounts for every encounter, directly or indirectly, planned or unplanned, that a customer makes before purchasing or patronizing a brand, during consumption, and after the purchase (Lemon & Verhoef, 2016; Marquez et al., 2015; Rishi & Popli, 2021; Rosenbaum et al., 2017; Villaespesa & Alvarez, 2020). The map captures customer experience from the cognitive and emotional dimensions, their information-seeking and knowledge-sharing behavior, their media and technology preferences, and their responses to the environment around them, including influential or pressure groups and competitors (Lemon & Verhoef, 2016; Marquez et al., 2015; Temkin, 2010). It helps to look at the customer experience from the outside; that is from their perspective and avoid making incorrect or misleading assumptions (Temkin, 2010). Hence, the mapping allows for a comprehensive understanding of customers' true experiences.

The customer journey map is a flexible tool that can be used in several ways. It is most commonly used in designing and improving the customer experience with a brand by identifying pressure points and opportunities for improvements (e.g., Moon et al., 2016; Rosenbaum et al., 2017; Newbery & Farnham, 2013). It is also often used to improve service quality (e.g., Halvosrud et al., 2016; Ludwiczak, 2021). Today, customer journey mapping is being adopted for visitor experiences including museum visitors (e.g., Lin et al., 2020; Villaespesa & Alvarez, 2020). Studies on youth experiences have also capitalized on the extensive information that can be gained during the mapping exercise (e.g., Ellis et al., 2022; Mele et al., 2022)

5. Study Objectives

This study aims to generate new and more comprehensive insight into the young generations' experience of cultural heritage as visitors to heritage sites. Cultural experience is considered in a broad sense, encompassing various encounters at the physical sites and other encounters, including those in the virtual world and pre-visit, during-visit, and post-visit encounters. The premise is that these encounters contribute to the overall experience of visitors and their meaning-making of the cultural heritage.

Specifically, this study aims to:

Map the journey of the young generation in experiencing the cultural heritage of George Town, the Historic Cities of the Straits of Malacca, and the Archaeological Heritage of Lenggong Valley.

Determine the key touchpoints (pre-visit, during visit, and post-visit) along the cultural experience journey that shapes the young generation's overall experience.

Understand how the young generation derives meaning from the heritage based on the encounters that they have along the cultural experience journey.

6. Study Locations

To date, Malaysia has two cultural UNESCO World Heritage Sites: Melaka and George Town, Historic Cities of the Straits of Malacca (https://whc.unesco.org/en/list/1223) and the Archaeological Heritage of Lenggong Valley (https://whc.unesco.org/en/list/1396). Both provide two distinct cultural experiences that will offer diverse insights into visitors' touchpoints.

6.1. George Town, Historic Cities of the Straits of Malacca

Two cities, Melaka and George Town, were inscribed together as UNESCO World Heritage sites in 2008 in recognition of their significance in featuring the trading and cultural exchanges between East and West in the Straits of Malacca (https://whc.unesco.org/en/list/1223). Melaka is in southern Malaysia, and George Town is approximately 400km away in the north of Malaysia. They both depict influences of Asia and Europe reflected

in the cities' multicultural tangible and intangible heritage (https://whc.unesco.org/en/list/1223). They host the most complete surviving historic city centers on the Straits of Malacca, with trading routes with Great Britain and Europe through the Middle East, the Indian subcontinent, and the Malay Archipelago to China (https://whc.unesco.org/en/list/1223). They highlight unique architectural and cultural townscapes without parallel anywhere in East and Southeast Asia (https://whc.unesco.org/en/list/1223).

This research focuses on George Town, located in Penang, Malaysia. George Town's unique features lie in the concentration and variety of houses of worship and associated structures, and the streetscape of shophouses (Tan et al., 2019). George Town offers a special blend of religious pluralism, historic townscapes, and living heritage that can today be observed in the daily lives, rituals, trades, and cuisine of the inner-city community (Tan et al., 2019). The ambiance created by this diversity has led to George Town often being referred to as an open-air museum or a museum without walls (Tan et al., 2019).

6.2. Archaeological Heritage of Lenggong Valley

The Archaeological Heritage of Lenggong Valley was enlisted in the UNESCO World Heritage in 2012 (https://whc.unesco.org/en/list/1396). It is located in the Lenggong District, in Perak, Malaysia. The inscription comes in recognition of the valley's long record of human civilization in one locality, which can be traced back to two million years ago. There are four archaeological sites located in two clusters. They tell a story of ancient prehistoric civilization with mass tool production workshops, as evidenced by the numerous hand axes and flake tools strewn across the site (Shuhaida, 2018). The many sites in a relatively contained area suggest the presence of a fairly large, semi-sedentary population with cultural remains that span the paleolithic, neolithic, and metal ages (https://whc.unesco.org/en/list/1396).

One of its most widely known archaeological heritage is the Perak Man, recognized as South-East Asia's oldest most complete human skeleton. It has been "radiocarbon dated to 10,120 BP and identified as Australomelanesoid, a hominid type occupying the western part of the Indonesia archipelago and continental South-East Asia at the end of the Pleistocene and early Holocene" (https://whc.unesco.org/en/list/1396). Evidence indicates that there has been a decline in the initial populations given a meteorite impact, followed by the super volcanic eruption of Toba at 70,000 b.p (https://whc.unesco.org/en/list/1396/).

The Lenggong Valley covers an area of 9,773 hectares, featuring approximately 75 caves, with 16 caves having been explored, seven of which were formed approximately 330 million years ago (Mastura et al., 2014). It has a scenic landscape strewn with rivers and waterfalls and hosts a rich diversity of flora and fauna within its rainforest equatorial ecosystem (Mastura et al., 2014).

7. Methodology

This study employs the qualitative research method. As an exploratory study, it employs the journey mapping approach, focus group discussion, and participant observations as the key methods of data collection. The data collection involves an organized visit of participants, accompanied by the researcher, to the UNESCO World Heritage sites in George Town, Penang, and the Lenggong Valley, Perak.

The journey mapping approach is used as a tool for participants to document their experience along

the key touchpoints that they have with the heritage in three phases: pre-visit, during visit, and post-visit. The focus group discussion furnishes insights into the participants' detailed experience of the various encounters with the cultural heritage and how they derive meaning from the heritage based on these encounters. The focus group discussion allows for sharing their personal experience and reflecting on others' experiences and opinions.

The participant observation is used to gain insights into participants' interactions with the cultural heritage, each other, and various media at the heritage site and their behavior and reactions at the site. The observations also reveal dimensions of experiences, particularly emotions, that may not be as readily revealed in the focus group discussion.

7.1. Population and Sample

The population of interest is the Malaysian youth, aged 15 to 24 years (https://www.un.org/en/globalissues/youth), as they are the ones that will steward the preservation and conservation of the cultural heritage. Learning about their cultural experience provides a better understanding of how they engage with the cultural heritage, how they derive meaning from it, and what they do or wish to do with that experience.

The study employed purposive sampling to recruit the participants. Participants were categorized into two main groups: school ages (15-17 years old) and tertiary education ages (18-24 years old). The total number of participants was 39 (19 in George Town, and 20 in Lenggong). The school-age group should have different perspectives on the cultural experience and different touchpoints relative to the tertiary education group. For example, the school-age group should be more dependent on their teachers and parents for their cultural knowledge. Participants were recruited via brochures distributed through social media (see Appendix 1)

7.2. Data Collection Process

The study first organized a trip for the two participant groups. The participants were asked to start developing their journey map two weeks before the visit. The two weeks provided ample time for participants to seek information, should they wish to. They then visited the heritage sites with the researchers. The researchers actively participated in the visit, going through the sites with the participants and interacting with them. The involvement of the researchers is crucial to guide the focus group discussions such that they could highlight certain experiences relevant to the research objectives. The researchers also took photos during the visit for the focus group discussion.

Two weeks after the visit, they invited the participants for the focus group discussion. The participants were requested to discuss their encounters with the cultural heritage before, during, and after the visit, based on any touchpoints that they have (e.g., discussion with friends and searching for information on the Internet) and their thoughts and feelings during those encounters. The Customer [Visitor] Journey Map technique (e.g., Marquez et al., 2015; Rosenbaum et al., 2017) guided the analysis. The data were analyzed based on the touchpoints, the stages of the journey, and the actual journey (Marquez, 2015; Rosenbaum et al., 2017). The touchpoints represent every encounter participants had with the cultural heritage and the

steps they followed through the journey (i.e., information seeking, using interactive media at the heritage site, and writing reviews). For every touchpoint, participants' thoughts, motivations, feelings, opinions, and recommendations were analyzed and interpreted. Themes on each were developed based on the triangulation of data from the journey maps and the focus group discussions.

8. Data Collection (May-September 2022)

The data collection process is delineated in the following sections.

8.1. Development of Visitor Journey Mapping Procedure

8.1.1. Journey Mapping Technique

The visitor journey mapping procedure was guided by the customer journey mapping techniques often used in marketing and more recently in public services. After reviewing numerous journey maps and best practices in the academic literature and industry, considering the youths' inclination for using images and online media, and how much effort and time they would be willing to spend in completing the map, the study employed the Visitor Journey Map, as it was straightforward and flexible in creativity and format, comprising elements to reflect sensory experiences, thoughts, and feelings. Participants were allowed to complete the map either in English or in the Malay Language.

8.1.2. Visitor Journey Map Template

A template was developed to guide the participants, but they were encouraged to use their style and creativity to communicate their experiences and express their thoughts and feelings. The Visitor Journey Map template reflects three phases of the experience: Before, during, and after the visit. The template comprises the following key elements:

1) Activities: The specific activity that relates to the heritage?

- 2) Touchpoints: What are the points of contact with the heritage?
- 3) What is going on?: What happens on the ground?
- 4) Thoughts: What do they think during that point of contact?
- 5) Feelings: How do they feel at that point of contact?
- 6) Challenges/problems: What are the downside/negative parts of that experience?
- 7) Opportunities to improve: What are their suggestions to improve that experience?

The template was pilot-tested and its wording and format were improved for the final template (see Appendix 2). The participants of the study provided written informed consent to participate in the study.

8.2. Engagement with Partners

8.2.1. Penang UNESCO Heritage Site Collaborators

The visit to the Penang UNESCO Heritage Sites was arranged in collaboration with the Persatuan Pewaris Budaya Pulau Pinang (Penang Cultural Inheritors Society). The society was consulted for their recommendations on the sites and routes for the visit. Moreover, the society also provided a guided tour of one of the key sites (i.e., the Khoo Khongsi).

Another collaborator was the Penang Hajj Gallery. Despite being at the core heritage zone, the Penang Hajj Gallery has not been much on the radar of visitors, as it is located in a rather secluded area. It does, however, provide a vital testament to the history of Penang as the administration center for the Muslims' pilgrimage to Mecca. The Penang Hajj Gallery opened its doors to the visit during its closed business hours on Saturday and provided a guided tour.

8.2.2. Lenggong Valley UNESCO Heritage Site Collaborators

The visit to the Lenggong UNESCO Heritage Site was arranged in collaboration with the Center for Archeological Research, Universiti Sains Malaysia. The center has a field station at the heritage site with its gallery and various facilities for visitors. Researchers from the Center were primarily responsible for the archaeological research in the area. The center provided a package guided tour inclusive of site visits, hands-on experiences, and exposure to Lenggong heritage food through the help of the local community.

8.3. Briefings to Participants

A briefing to the two participants group was held two weeks before the visit (on July 7, 2022, for the George Town visit; and August 12, 2022, for the Lenggong Valley visit).

The briefing comprised the timeline of the project, explaining that the journey mapping must be completed in three phases: 1) their experience during the two weeks before the visit, 2) their experience during the visit itself, and 3) their experience during the two weeks after the visit. The Visitor Journey Map template was presented to participants, and each element in the template was thoroughly explained. Examples of what a completed Visitor Journey Map would look like were also presented. Participants were encouraged to use their creative styles while including the key elements needed in the research. They were reminded to be highly comprehensive in identifying touchpoints and narrating experiences at each touchpoint. Additionally, the briefing included logistical matters relevant to the visit. It was recorded and made available to the participants.

8.4. Heritage Sites Visits

George Town Heritage Site Visit, 23 July 2022

The itinerary was finalized after a site recce by the researchers. It included sites reflecting heritage from various eras and diverse ethnic groups. George Town is approximately 15 km from the Universiti Sains Malaysia main campus. The visit was attended by 20 participants.

8.4.2. Lenggong Valley Heritage Sites Visit, 21 August 2022.

The itinerary was prepared in discussion with the Center of Global Archaeological Research that coincidentally has been organizing heritage site tour packages at the Lenggong UNESCO Heritage sites. The itinerary includes gallery visits, site visits, and hands-on excavation and stone-tool-making activities. Given that the official Lenggong Gallery was closed for renovation, the center set up a temporary gallery

TIME	VENUE	DESCRIPTION		
8.00 AM - 8.30 AM	Registration at USM			
8.30 AM - 9.00 AM	Departure from USM			
9.00 AM - 9.45 AM	Padang Kota Lama and Fort Cornwallis	A scenic by-the-sea heritage area. Fort Cornwallis is a British India Company fort built for administrative and defense purposes. The antiquities include canons, a chapel, a lighthouse, and a gunpowder building or magazine. Today, a statue of Captain Sir Francis Light (founder of the British Settlement in Penang), food trucks, a restaurant, and photo-op sites are included.		
10:00 AM	Pinang Peranakan Mansion	The mansion showcases the cultural heritage of the Peranakan community, depicting the opulent lifestyle of the Babas and Nyonyas (Chinese settlers) who adopted the selected ways of the local Malays and later the British.		
10.30 AM - 10.50 AM	Heritage walk on "Harmony Street" (Jalan Kapitan Keling) Heritage shophouses and townhouses Showcases of Muslim, Indian, and Chinese cultural heritage	The street is lined with shophouses from various eras, showcasing the typical architectural styles of the Malacca Straits settlements. It is unique in that it features four major religious worship buildings in one place: the Goddess of Mercy Temple, the Sri Mariamman Temple, the Kapitan Keling Mosque, and the St. George's Church.		
10.50 AM – 11.30 AM Street Arts on Armeniar Pix and games		Street art has been one of the key attractions in George Town, especially for younger visitors.		
11.30 AM - 12.00 PM	Lunch	Lunch packs were provided for the participants.		
12.00 PM - 12.30 PM Visit Penang Hajj Gallery and Acheh Mosque		The Penang Hajj Gallery showcases the Muslim pilgrimage to Mecca or Hajj. The building on Acheh Street previously housed the Hajj administration center.		
12.30 PM - 1.45 PM	Site-seeing* / Break / Prayer	Participants took a break at the nearby park. Muslim participants prayed the noon prayers at the historical Acheh Mosque.		
2.00 PM - 3.00 PM	Guided Tour at Khoo Kongsi	The Khoo Khongsi is one of the most prominent Chinese clan associations in Malaysia, with a lineage extending to 650 years. The visit involves going through the clan's terrace houses, their facilities, and a gallery.		
3.00 PM Departure to USM				

<Table 1> Itinerary for George Town Heritage Sites Visit

for Lenggong Valley visitors. The Lenggong Valley is approximately 160 km from the Universiti Sains Malaysia main campus. The visit was attended by 19 participants.

8.5. Journey Mapping by Participants

Each participant was given a google drive link to submit their journey maps in designated folders. Two folders were created: one to submit their journey map and another to submit miscellaneous materials























Figure1-11. Visit to George Town Site

such as photos and printscreen or snapshots of the social media pages. Appendices 3A and 3B present examples of the journey maps.

Participants were required to complete the "Before" journey map before visiting the heritage sites to ensure that they can record their experiences as they happen. It also allowed the researchers to check their journey map and determine whether they could understand the instructions for completing the map.

For the "During" journey map, participants were each given a physical folder containing prints of the Journey Map templates and a pen to jot down their experiences as it happens. Knowing that they may be too engrossed in the experience and may not capture everything on site, they were reminded to complete the journey map when they went home.

The mapping of the "After" visit was completed within two weeks after the visit. The researchers constantly

TIME	VENUE	DESCRIPTION
8.00 AM	Registration at USM	
8.30 AM	Departure from USM	
10.00 AM	Arrival at Field Research Centre, Lenggong Valley. Briefing at the Gallery.	The field research center houses the Centre of Global Archaeological Research field laboratory for the Lenggong Valley heritage team from Universiti Sains Malaysia. It also houses a small gallery open to visitors of USM.
10.30 AM	Hands-on Activities Excavation of archaeological artifacts (mock site) Making of stone tools (hand axes, cutting tools)	The excavation and the hands-on activities were conducted in the Field Research Centre. The archaeological research team set up a mock archaeological site for participations to experience firsthand how archaeological excavations are conducted. The stone-making activities involve participants breaking river stones to turn them into usable tools.
12.00 PM	Lunch Heritage cuisines served at traditional Malay house Site-seeing of nearby river and forest	The traditional cuisines were prepared by the local community, using local fruits, fish, and vegetables. Lunch was served by the local community at a traditional wooden village house, located next to a river.
1.30 PM	Break / Prayer Street	
2.15 PM	Kepala Gajah Limestone Complex	Participations walked through a forested area to an excavation site, where the 10,000-year-old 'Perak Woman' skeletons were found at the Kelawar Cave.
3.00 PM	Badak Cave	Participants took a small hike to the Badak Cave to view cave paintings of the indigenous people. The paintings depict the mountain ranges around the area, the animals, and the British people during the British occupation.
4.00 PM	Bukit Sapi	The site features a mount of 70,000-year-old volcanic ashes from Mount Toba, Indonesia.
5.00 PM	Departure to USM	

<Table 2> Itinerary for Lenggong Valley Heritage Sites Visit



Figure. 12-23. Visit To The Lenggong Valley Site



Figure 24. One of the focus group discussions with the George Town participants.





checked the google drive folders to ensure that the participants had completed all three phases.

All participants completed their journey maps. Participants understood their role and provided comprehensive data for analysis. The flexibility of the template was advantageous, as participants used various methods to express their thoughts and feelings including narratives, drawings, and images. Additionally, they also provided snapshots or printscreens of their online communications.

8.6. Focus Group Discussions with Participants

The focus group discussion with the George Town group was held on August 11, 2022, and that with the Lenggong group was held on September 13–16, 2022.

The focus group discussions were held two weeks after the visit. As participants hail from various locations, making a face-to-face meeting a challenge, the discussions were held online via Webex. The discussion sessions were recorded to facilitate a transcription process. The focus groups had five to six participants in each group, led by a researcher. The small number allowed the researcher to closely discuss

the journey maps, and all participants had the opportunity to participate. All three phases were discussed, focusing on the touchpoints and the thoughts and feelings at each point. The discussion captured many more touchpoints not initially included in the journey maps participants submitted. Participants also reflected on their visits regarding how they relate to the heritage and what they gained from it. Each session took approximately two hours.

9. Findings

Data from the visitor journey maps, the focus group discussions, and participant observations during the visit contributed to a rich data set, revealing participants' thoughts, feelings, and emotions about their experiences with the heritage. Heritage experience in this study is defined as any interaction that the participants had at all the touchpoints before, during, and after the visits.

9.1. Touchpoints and Participants' Experiences

CATEGORIES	TYPES				
Authoritative content/information	School syllabus; teachers; websites of agencies/ organizations; brochures/pamphlets; social media				
Experiencing exhibits	Briefings; tour guide; exhibits; signages; posters; paintings; audiovisuals				
Hands-on activities	Mock excavation; tool-making; hiking; games				
Firsthand storytelling from others	Families, friends (including virtual)				
User-generated contents	Posted content by past visitors; posting of own experiences				
Online engagements	Comments; shares; likes; following; saved contents				
Evocation of senses	Heritage cuisines; experiencing nature; food sampling				

The touchpoints uncovered in the journey maps are categorized as follows:

As expected, participants were already exposed to the heritage before the project via various touchpoints. The typical touchpoints were school textbooks, teachers, families, mass media, and online media. Textbooks, teachers, and mass media, for example, provided "authoritative" knowledge, while friends and families offer layman interpretations, some coming from stories of the local community and how the heritage relates or is intertwined with contemporary life. Many of the participants learned about the two heritage sites from the syllabus at school and did school assignments on the heritage. Nevertheless, they explained that they still did not know much about why the two sites are world heritage sites.

From these touchpoints, the comparison between the online and offline touchpoints is as follows.

9.2.1 Online media

Participants' engagement on online media revealed some interesting insights. Online media comes into play in four ways. First, it is used at the initial stage to search facts; the typical approach is to conduct a general browser-based search (e.g., google search), where participants use keywords such as George Town, Lenggong, UNESCO World Heritage, and Perak Man to find information about the two heritage sites.

However, it proved to be a rather frustrating experience for participants, as they kept getting the same information even from different websites (e.g., Penang Tourism Website, UNESCO World Heritage websites, and tourist-related websites). They lamented the long, repetitive, and uninspiring contents. Below are examples of the contents from formal sites accessed via a browser search:

Secondly, due to the uninspiring contents in the first method, the participants alternative was to go directly (bypassing the browser search function) to user-generated platforms, most notably YouTube, Instagram and TikTok.



Figure 26. UNESCO websites on Lenggong Valley



Figure 27. The Penang government website on George Town

Second, given the uninspiring content, participants (bypassing the browser search function) sought user-generated platforms, most notably YouTube, Instagram, and TikTok.

The participants love the on-ground experiences of those who have visited the sites and prefer

- Stories from ordinary everyday people
- Interesting and unique anecdotes
- Creative and highly engaging content (not just based on technology or effects, but from the stories told)
- Variety of content
- Prefer videos to texts, in small chunks
- Main platforms: Youtube, TikTok, Instagram, blogs, Twitter, Telegram, Whatsapp, Facebook

To them, such UGC, with anecdotes, images, videos, and reviews are more interesting and informative regarding what to expect at the heritage sites. Arguably, other visitors' experiences serve as a benchmark and a guide to participants' upcoming visits. Such UGC may not contain the interpretations and opinions of heritage experts, but they were nonetheless important to get the participants to take interest in the heritage.

Thirdly, online media is used to engage with others about heritage sites. Social





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Figure 28-30. Some of the user-generated contents accessed by the participants are shown below:



Figure 31-33. Contents posted by the participants on various social media platforms

media, such as Instagram, WhatsApp, and Twitter are used to enquire about other peoples' experiences and express curiosity, fears or anxiety, and thoughts. User-generated platforms, particularly Instagram, are used extensively to post their content in the form of insta-stories that can be accessed by others and, importantly, archived. Notably, participants created and posted content (e.g., insta-stories, WhatsApp status) even during the visit; they would post as they experience and gain engagement (e.g., likes/ comments) from their audience. Thus, opportunities are abundant from the heritage promotion perspective. Depicted below are some of the contents posted by participants:\

Fourth, beyond the proactive efforts by participants in gaining information and engagement with others about heritage sites, online media, including social media, were also "feeding" or pushing content to them. The TikTok algorithm, for example, would detect their interest in George Town and heritage sites and would start pushing such content. Similarly, participants found their Facebook feeds filled with content related to George Town.

Each of these online touchpoints provides different knowledge and experience but, together, shapes the total experience. Hence, the integrated approach in curating heritage experiences should be seriously considered, akin to how brands create awareness and engagement with consumers.

9.2.2 Offline media

In general, for offline touchpoints, participants prefer storytelling approaches. They were highly engaged when tour guides, audiovisuals, or signages make the connection between the artifacts and the people behind them. Therefore, it is not sufficient for them to know what the artifacts are; what they are most interested in are how the artifacts are used in the lives of people in the past, who these people are, how they live, and what they value. On listening to the stories, participants were interested in the specific things at the site, such as the artwork, wood carvings, family trees, and cave drawings. With the stories, participants made inferences about their life today. For example, one participant observed that the ancient people share events in their life and their environment on the cave walls just like how he and his friends today post the things that happen in their life and their activities on social media.

Participants also prefer life briefings from tour guides or archaeologists. They find that the interactivity with personnel allows for in-depth understanding relative to reading signages or relying on audiovisuals. They could ask questions that may come to their mind during the session and get instant responses. They also find that interactivity with a human helps in making the experience more real, particularly when they interact with the archaeologists, because they could meet the important people behind the findings and conservation efforts. At the Lenggong site, for example, a few participants indicated that they appreciated the hard work of the archaeologists. The live interactions also allowed the participants to broach sensitive questions and address misconceptions. For example, many of the participants who were non-Muslims had the opportunity to ask about the Muslim prayers and pilgrimage that they had always been curious about.

The two heritage sites offer dissimilar experiences given the nature of the heritage and the way the visits were designed. The George Town heritage sites are of modern times, and much of what is being showcased is intact and highly relatable to contemporary society. The visit took participants from one point to another on foot, allowing them to stop at points of interest before moving on. At the key heritage sites, signages and guides provided information. Notably, participants' approach to the visit was more toward sightseeing and leisure, perhaps because of their familiarity with the heritage: the town is familiar, and the shophouses do not seem any more different from other shophouses. The tourist guides played a key role in gaining their interest; participants paid more attention to and become interested in the heritage during storytelling sessions.

However, for the Lenggong heritage sites, participants were highly engaged throughout the visit. The activities during the visit require active participation right from the start. Participants were appreciative that the initial briefing at the gallery was concise; they felt that 30 minutes of listening to the explanation was just right to gain their interest and pique their curiosity. Notably, the gallery where the briefing took place was a temporary gallery; thus, the showcases were limited to a replica of the Perak Man, stone tools, and the ashes of Lake Toba volcano, in addition to rudimentary infographics and posters. However, participants' interests did not wane; in fact, they were more curious about what to experience next. One participant who previously visited the gallery when he was a child commented that a full-fledged gallery would be better but said he enjoyed his visit more given the hands-on activities.

The excavation and stone-tool-making activities allowed the participants to appreciate the heritage site.

They commented that they have heard of and seen stone tools and archaeological artifacts in the media but never truly grasped what they have. Making tools and excavating artifacts (replicas) themselves added a personal and meaningful touch. Moreover, hiking to the caves, seeing firsthand the excavations sites and cave paintings, and touching the mounts of Lake Toba volcanic ashes made the experiences highly memorable, inducing participants to contemplate the underlying meanings. Moreover, many commented that they are now more appreciative of the effort by archaeologists; these digital natives were in awe of the efforts and patience of the archaeologists. Consequently, they also appreciated the importance of conservation at heritage sites.

9.2. Heritage Knowledge and Awareness

Most participants knew about the heritage sites before the project but did not have intimate knowledge. Their knowledge before the project came from various touchpoints, including friends, families, mass and online media, and visits with family or school.

For George Town, since all the participants are from Penang, many of the participants have visited the core zone as a tourist attraction or a place for hanging out with friends and families; their visits were mostly for shopping, eating, and sightseeing in scenic areas. They knew that George Town is a UNESCO World Heritage site but did not have much knowledge of why. Their knowledge of George Town as a historical site was limited to the British settlements in the 1780s and onwards. Many of the participants were surprised by the richness of the heritage in their hometown. They explained that the school syllabus did not cover the entirety of the heritage. With the knowledge that they gained at the site, they were more appreciative of cultural diversity. Their experience at the site opened the window for them to be interested to learn more about the cultural values of others.

For Lenggong, participants are mostly unaware that it is a UNESCO World Heritage site. Most have heard of the Perak Man, one of the key archaeological findings, from a cursory mention in their school history textbook. They do not, however, know about all the other findings that made the site important for human civilization to be listed as a world heritage site. Three participants visited the site when they were children. Two (twins) visited Lenggong with their family for a wedding; thus, their visit was limited to sightseeing and bonding with relatives. Another participant visited the Lenggong Gallery in 2014 with his school. He remembered his experience going through the gallery and seeing the artifacts, particularly the replica of the Perak Man, but the significance of the site remained unclear to him. The current visit to the site allowed participants to understand the site's value in greater depth. They now knew that the site was home to humans as far back as 1.8 million years ago, much older than the 11,000-year-old Perak Man. The knowledge provided a better perspective on the value of the Lenggong heritage site.

The on-site visits to both sites exposed them to the various artifacts firsthand and raised greater interest in the heritage, revealing things they were unaware of. Their perspective on George Town shifted from seeing it only as a town for sightseeing and spending time with friends and families to a heritage site that offers multicultural perspectives of Malaysia. As for Lenggong, many are now amazed by the richness of the paleontological artifacts and the fact that modern civilization is privy to such artifacts from a million years ago. They find it unique that the caves, for instance, are just within a walking distance from a housing area, that the Perak Man and Woman (each approximately 11,000 years old) were effectively found in their backyards.

It was interesting to observe that the reflections on the heritage during the focus group discussions were more intimate and profound among the Lenggong participants than the George Town participants. Some of the Lenggong participants reflected on how different we are from the people of the past but similar in some ways, such as interest in food and the arts: we eat the same food as they did and have the same interest in arts, although expressed on different canvases and in different ways. One participant reflected on religion and struggled to negotiate what he saw at the site and what he knew from religious texts.

10. Conclusion and Recommendations

The study revealed that youths experience heritage from multiple sources: formal/authoritative (e.g., heritage site management; school syllabus) and non-formal (e.g., friends and families; UGC) sources. The touchpoints of participants with the heritage before the visit revolved around what have been exposed to them at school, discussions with friends (online and offline), and information-seeking activities online. These touchpoints are important in that, together, they shape participants' initial perception, sometimes with misperceptions, and geared them toward what to expect. However, touchpoints from the school syllabus had not provided in-depth knowledge nor made heritage sites interesting for participants. After the visit to the heritage sites, participants are fascinated and hoped that their schools can make it a more prominent feature in the syllabus and make them more interesting.

Surpr isingly, many participants found browser search (e.g., google search) information off-putting and frustrating for being repetitive and uninteresting; many found them to be too formal. Sources from heritage management sites or "owned" media, undoubtedly, provide reliable information. However, given their uninteresting presentation styles, participants prefer other sources of information. They prefer "stories" from family and friends or people who have posted their experiences online. For youths, stories can render heritage sites to be immersive. They are interested in the stories of the people of the past and use them to find parallels to their life today. Meanwhile, they are also interested in other visitors' stories and how they experience the heritage sites. Therefore, heritage management websites must consider having more interesting content, with more relatable stories updated regularly to capture the youth's interest. Balancing the 4E elements must be addressed to meet the needs and motivations of the youth. Arguably, youths want human stories with entertainment, escapism, and esthetics; they are interested in the education elements more if presented with the three elements.

The youth prefer UGCs accessed via social media platforms such as YouTube, Instagram, and TikTok. They prefer videos to texts or images, as many sought short video platforms, bypassing conventional browsers. One recommendation is that those in charge of heritage promotion should consider posting stories of visitors and even social influencers in the form of vlogs (as opposed to just images). UGCs can be encouraged through familiarization trips often used in destination marketing. UGCs tend to be more creative and generate more engagements when other users share, like, or follow. They are preferred for their aesthetic, entertainment, and escapism values while offering educational values. The links below provide examples of creative UGCs on cultural heritage:

Another key finding from the study is that the heritage experience for youths is a social experience. They were sharing their thoughts and feelings about the heritage even before the visit through groups created on WhatsApp or telegram with friends going on the trip. The groups were created to share information, prepare for the trip, and later archive images and content. Moreover, as in the journey maps and focus group discussions, young participants love to create content and post online. What organizers (e.g., heritage management) must realize and appreciate is that such activities offer opportunities for earned media (i.e., promotion by the public). These opportunities can be leveraged by providing more opportunities or incentives for participants to create content, such as by creating "insta-worthy" spots, points of interest, or unique experiences (e.g., mock excavation). However, as per one participant, while they do get interests and queries from their friends about the heritage experience that they posted, the conversation tends to stop there. Thus, the challenge is how to further leverage on UGCs and the earned media. One idea is to create an online community for the heritage site such that individuals with similar interests can post their content and continue their conversations there.

Another interesting or rather eye-opening insight from the data was that some participants were posting their experiences online as they were experiencing them, hence generating a multiplier effect regarding communicating or promoting heritage. Thus, site organizers must note that they may be communicating with more than the number of individuals in front of them.

Unsurprisingly the youth's preferred touchpoints at the heritage sites were the hands-on activities and storytelling by the tour guides. However, the hands-on activities turned out to have longer and stronger





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Figure 34-35. Creative user-generated contents on cultural heritage





Figure 36-37. From single player to multiplayer Virtual reality multiplayer games to create immersing heritage experience

cognitive effects on the participants than storytelling. During the focus group discussions, participants who participated in the excavation and stone-ax-making activities showed greater reflections on the meaning of the heritage on how people lived in the past and how we live today. It will be interesting to conduct further investigation on this observation through a quasi-experiment in the future.

Nonetheless, the hands-on activities may not be practical for some heritage sites. Therefore, virtual reality technology can be used to conduct activities. For example, participants can do archaeological excavations at hard-to-access sites (e.g., caves, forests) through virtual reality devices. The activities can be turned into games, such as collecting points based on the number of artifacts excavated, to make the experience more interesting and exciting for the youths. Moreover, per their preference for social experiences, the games can be turned into multiplayer games to play with their friends worldwide over the Internet. Additionally, the use of virtual reality technology and 3D should encompass depicting artifacts and architecture authentically and providing a world where visitors can role-play and step into the shoes of the people of the past.

3-D technology can also be used to bring "alive" artifacts and people of the past. Youths in this study were interested in who such people were, how they lived, and what they valued. The 3-D technology should be used to incorporate people of the past in the virtual environment, such as the Perak Man in Lenggong. Perak Man in its current form is a skeleton, but the 3-D technology can be used to recreate his form, just like how the Penang Woman was recently reconstructed using the 3-D technology, as depicted below. Hopefully, allowing the youths to have the opportunity to interact with people from the past in a virtual environment will help them better imagine how things were like and feel a stronger emotional connection with the past.

This study has successfully assessed the key data from the journey maps and the focus group discussion. Regarding the methodology, the analyses indicate that the journey mapping approach in combination with the focus group discussions is highly valuable in revealing a comprehensive inventory of the touchpoints participants have with the heritage site. Unlike most past studies that use solely the journey mapping approach to reveal the touchpoints, the combination of the journey mapping and the focus group discussion proved to be superior. For instance, participants missed some touchpoints on the journey maps, which were only revealed during the focus group discussion. Therefore, future research can use the journey map is used as a stimulus in getting participants to discuss their experience in the journey, akin to projective techniques.



Figure 38. Prehistoric 5,000-year-old 'Penang Woman' finally has a face https://www.nst.com.my/news/nation/2022/08/821652/ prehistoric-5000-year-old-penang-woman-finally-has-face-nsttv The focus group discussions allowed the participants to reflect on their experiences, inducing them to share opinions and perspectives on the visit and how they relate to the heritage. While the journey mapping was constructed manually by each participant, future studies can make use of software such as mural.co to allow for collaborative work among participants.

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APPENDIX 2. -VISITOR JOURNEY MAP TEMPLATE

PHASE/FASA	BEFORE/DURING/AFTER SEBELUM/SEMASA/SELEPAS		
ACTIVITIES/AKTIVITI			
TOUCHPOINT & CHANNEL/ TITIK SENTUH & SALURAN			
THINKING/PEMIKIRAN			
FEELINGS/PERASAAN			
VISITOR EXPECTATION/ JANGKAAN PELAWAT			
OPPORTUNITIES TO IMPROVE/ PENAMBAHBAIKAN			

APPENDIX 3A. –EXAMPLE OF JOURNEY MAP TEMPLATE GEORGE TOWN VISIT "BEFORE"						
PHASE/FASA	BEFORE/DURING/AFTER SEBELUM/SEMASA/SELEPAS					
ACTIVITIES/AKTIVITI	Know about this program	Do some research about Georgetown	Listen to the video and read the slides that have uploaded in the Google drive	Make sure I have completed my Customer Journey Map before the deadline given		
TOUCHPOINT & CHANNEL/TITIK SENTUH & SALURAN	WhatsApp group	Google	Webex and Power point	Microsoft Word		
WHAT'S IS GOING ON?/ APA YANG TERJADI?	Feel like want to join the research team to explore Georgetown	Found out there are many places in Georgetown that have never been explored before	Have a clearer image of what to prepare before the trip	Must make full preparations for the upcoming tasks		
THINKING/PEMIKIRAN	I hope I have the opportunity to participate the research team	Can't wait to explore Georgetown	Must double check my backpack to avoid forgetting to bring my IC and the form	Arrange a schedule to finish the task so that I can finish all the tasks on time		
FEELINGS/PERASAAN	Excited and nervous	Very excited	Nervous	Nervous		
CHALLENGES/ PROBLEMSCABARAN/ MASALAH	May not get selected because only 20 people are needed	Information in some areas of Georgetown is limited	l might still forget to bring any important things like a hat and umbrella	Worried that my Customer Journey Map is not detailed enough		
OPPORTUNITIES TO IMPROVE/ PENAMBAHBAIKAN	-	The information provided in Google can be more detailed so that we can have a better understanding of it	-	-		

"DURING"						
	PHASE/FASA			BEFOI SEBELU	RE/DURING/AFTER M/SEMASA/SELEPAS	
	ACTIVITIES/AKTIVITI For		Cornwallis	Pinang Peranakan Mansion (Baba Nyonya House)	Penang Hajj Gallery	Khoo Kongsi
Cł	TOUCHPOINT & HANNEL/TITIK SENTUH & SALURAN	unc boc -A la	-An derground om shelter rge cannon	-Beautiful baju kebaya shown in the bedroom -A crown and necklace made by real blue bird feathers	-A room showing what they need to bring when they visit Mecca -The large Ka'bah model was shown when we step in the gallery	-A sign board shown what material they use and also the process they build Khoo Kongsi -A TV showing performance they held at Khoo Kongsi before
W	/HAT'S IS GOING ON?/ APA YANG TERJADI?	Ha arour and first t boc	ve a walk nd this place I this is my ime to see a om shelter	Gain knowledge about Baba Nyonya culture from many aspect	Get to know about some information of Muslim pilgrimage to Mecca	Have a clear understanding about the Khoo's
I	'HINKING/PEMIKIRAN	Get to know some history about Fort Cornwallis		More time needed to explore because the Baba Nyonya house is very big	Need to improve my knowledge about Muslim culture	The history about the Khoo's are interesting and amazing
F	FEELINGS/PERASAAN	Imp	ressive and excited	Chill and relax	Surprise and interesting	Informative and amazed
CF	IALLENGES/PROBLEMS CABARAN/MASALAH	No det this learn there	t so much ails about place are ed because are no tour guides	No tourist sign boards are provided so we can only learn something from what we see by understanding ourselves	This place is rarely known	Some information cannot be heard clearly from tourist guide
	OPPORTUNITIES TO IMPROVE/ PENAMBAHBAIKAN	Car sor inf sigr that mor inf abou	n provide me tourist ormation n board so we can get re detailed ormation it this place	Can provide some tourist information sign board in each area so that we can we can have a better understanding about the Baba Nyonya culture	Can do some publicity to introduce this place so that tourists can have a visit here	The tourist guide can wear mice so that the information can be clearly transmitted to all the visitors

"AFTER"							
	PHASE/FASA	BEFORE / DURING / AFTER SEBELUM / SEMASA / SELEPAS					
	ACTIVITIES/AKTIVITI	Post Instagram stories to share my short trip with family and friends	Upload the photos taken	Complete Customer Journey Map on time	Presentation		
	TOUCHPOINT & CHANNEL/TITIK SENTUH & SALURAN	Instagram	Google Drive	Microsoft Word	Webex		
	WHAT'S IS GOING ON?/ APA YANG TERJADI?	Get some feedback from coursemates who are interested in exploring Georgetown heritage	Photos might be chosen as a reference for researchers	Recall the memories of the trip to better complete my journey map	Present my feelings and thoughts throughout this trip		
	THINKING/PEMIKIRAN	Can plan a Georgetown trip with coursemates in the coming semester	Hope that my photos are useful to researchers for reference	Have gained a lot from this trip such as knowledge about the heritage in Georgetown	Do preparation earlier for the presentation		
	FEELINGS/PERASAAN	Нарру	Joyful and a bit panic	Cherished	Nervous		
	CABARAN/MASALAH CHALLENGES/ PROBLEMS		Takes a lot of time to upload the photos because having an unstable Wi-Fi connection	-	Worried that I will have an unstable internet connection during my presentation		
	OPPORTUNITIES TO IMPROVE/ PENAMBAHBAIKAN	-	Upload all the photos using mobile data	-	Find a place with a good network connection		



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Establishing a Stakeholder Collaboration Framework for the Sustainability of the Penang Hill Biosphere Reserve

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Abstract

Penang Hill Biosphere Reserve (PHBR) has been acknowledged as Malaysia's third UNESCO Man and Biosphere Reserve site. Located on Penang Island, the PHBR comprises inland and marine areas. Initially, PHBR, with three main tourist attractions, has been independently managed by different agencies. Under the PHBR umbrella, all key stakeholders must support the program's initiative and work under a new governing structure for future PHBR sustainability. Therefore, this study focuses on stakeholder collaboration and sustainable tourism development. It reviews previous stakeholder collaboration frameworks and collects data from July through August 2022 to produce a novel framework for the sustainability of PHBR. Indeed, five frameworks have been discussed in the context of stakeholder collaboration. Accordingly, workshops were conducted with different stakeholders to identify the new management and PHBR sustainability issues. The proposed PHBR stakeholder framework is presented considering the incorporation of institutional and local issues, the future governance management structure, and the mechanism for stakeholder involvement. However, the framework has a limitation. Given that the management structure remains under planning, the actual implementation of the PHBR management plan remains pending. Nonetheless, it is feasible to improve the PHBR stakeholder collaboration framework by following the implementation of the PHBR management plan.

1. Introduction

The biosphere reserve is a large ecosystem that provides an enabling mechanism to integrate biodiversity conservation and development for a sustainable environment. Penang Hill (PH) and its surroundings received the designation "Penang Hill Biosphere Reserve" (PHBR) under the UNESCO Man and Biosphere (MAB) program for its unique natural and cultural heritage during the 33rd International Coordinating Council at Abuja, Nigeria, on September 15, 2021. It is the third and newest member of the UNESCO Biosphere Reserve Network in Malaysia, comprising 12,4810 hectares, with a network of 7,285 (58.3%) inland and 5,196 (41.7%) marine areas.

Most studies use the term "ecotourism" to represent the concept of "Biosphere Reserve (BR)." Schultz, Duit, and Folke (2011) argue that ecotourism fits well within the context of UNESCO BRs, which, since its introduction in the early 1970s, sparked the debate on the potential coexistence of objectives such as conservation and sustainable development. In ecotourism studies associate ecotourism with natural and local culture-based, ecologically sustainable areas; areas with natural and biodiversity conservation; areas with eco-tourists and local residents (Simon et al., 2011; Himoonde, 2007), and the benefit to local communities (Buchsbaum, 2004). This study, however, adopts Anderson's (2011) definition, where "ecotourism is the part of sustainable tourism [that] is made up of cultural, rural and natural tourism aimed to conserve biodiversity, sustain the well-being of local people, includes learning experience, involves responsible actions on the tourism industry, and requires lowest possible consumption on non-renewable resources and stresses."

Stakeholders are key to determining the success of a destination. Even so, stakeholder collaboration is affected by power, trust, financial capabilities, external support, social and cultural backgrounds, awareness level, and entrepreneurial skills of actors (Kimbu & Ngoasong, 2013; Palmer & Chuamuangphan, 2018; Timothy, 1998; Tosun, 2000; Towner, 2018). Most studies attribute ecotourism failures to ineffective stakeholder collaborations, such as inadequate stakeholder competencies and poor governance (Backman & Munanura, 2015; Bjork, 2007; Chan & Bhatta, 2013; Diamantis, 2018; Kennedy, Monica, Maria, & Carlos, 2013; Towner, 2018). In developing countries, ineffective collaboration among relevant stakeholders, no well-integrated ecotourism plans and community participation, and weak institutional arrangements are failure factors (Palmer & Chuamuangphan, 2018; Rudovsky, 2015; Stone & Stone, 2011).

This study develops a stakeholder collaboration model for biodiversity conservation, covering PHBR management, including the public, local community, policymakers (federal and state government), private sectors, and non-governmental organizations (NGOs). Collaboration refers to how actors convene to discuss issues of shared interest to reach a common ground (Jamal & Stronza, 2009). Stakeholder collaboration is generally seen as ensuring that different stakeholders interact during planning for smooth management, joint decision-making, empowerment, and innovation in facing challenges, identifying opportunities, and planning for current and future well-being (Pasape et al., 2012). It is vital, as it enables stakeholders to develop new skills for the site, minimize conflicts, and improve responsibility-sharing, inducing informed participation (Pasape et al., 2013). It is also considered a significant factor in determining the success of a biosphere reserve (Van Cuong, Dart, Dudley, & Hockings, 2018).



Figure 1. The natural conditions of PHBR. Source: The PHBR Dossier

As a newly recognized site, PHBR must learn from other successful biosphere sites for proper destination management. Notably, studies on integrating different stakeholders for biodiversity conservation are rare. Thus, identifying the stakeholder collaboration framework contributes to a harmonious ecosystem of achieving successful biodiversity conservation. As per Van Cuong, Dart, Dudley, and Hockings (2018), inadequate knowledge of a biosphere reserve by the stakeholders, communities, and the industry hindered sustainability in the biosphere reserve. Hence, this study bridges a critical gap in the prior literature.

This project proposes a stakeholder

collaboration framework for PHBR sustainability. Figure 1 shows the location of PHBR on Penang Island. The PHBR is organized into three zones: a core area that represents and protects its rich biodiversity, a transition area supporting human activities at a sustainable level, and a buffer zone to harmonize the biodiversity protection of the core area with the anthropogenic activities in the transition area. The transition zone around the buffer zone allows for socio-economic, research, and educational activities to be conducted sustainably.

The rest of the paper is organized as follows. Section two discusses various stakeholder collaboration frameworks. Section three describes the research methodology. Section four presents the results. Section five discusses the results and concludes the study.

2. Literature review

2.1 Stakeholder Collaboration: Context and Definition

PMI (2010) defines stakeholders as "Individuals and organisations who are actively involved in the project or whose interests may be positively or negatively affected as a result of project execution or successful project completion." Getz and Timur (2005) and Kadi et al. (2015) note that stakeholders, such as the local community, government, tourists, industry, educational institutions, and NGOs, greatly influence sustainability development. Understanding stakeholders' importance can help resolve a wide range of sustainability issues, and stakeholders' collaboration significantly impacts the area's development (Kadi et al., 2015).
Stakeholder collaboration is "a process of ensuring that there is the interaction of various stakeholders with common or related goals during planning, learning, decision making and empowerment mainly for the sake of enabling smooth management, collectively decision and innovation when tackling challenges, opportunities and plans for current and future well-being of a particular society" (Pasape et al., 2013). Other scholar defines collaboration as "a process through which parties who see different aspects of a problem can constructively explore their differences and search for solutions that go beyond their own limited vision of what is possible, thereby the process leads to a more comprehensive understanding of a problem that enables the participants to find new solutions that no one party could have envisioned or enacted alone" (Roberts, 1991, p.4). For this study, collaboration regards collective and innovative solutions when solving issues involving multiple stakeholders.

Notably, although the conservation and sustainable tourism literature use cooperation and collaboration interchangeably, their meanings in organizational behavior, theory, and development are distinct (Jamal & Getz, 1995). Unlike collaboration, cooperation means "working together to some end" (Fowler and Fowler 1964, p. 269), excluding the complex interpretations and necessary conditions covered by the term collaboration (Jamal & Getz, 1995). Therefore, when multiple stakeholders are involved in resolving conservation and sustainability concerns, the emphasis should be on collaboration that fosters a more profound understanding between the organizations and their problems.

Stakeholder collaboration is necessary when investigating various stakeholders with varying needs and interests (Majail & Webber, 2006; Novey, 2015). Issues like stakeholder conflict, human-wildlife conflict, and inefficient management may be remedied with a concerted effort to collaborate in conservation and sustainable tourism sectors (Ancrenaz et al., 2007; Ratner et al., 2017). Moreover, it is vital to comprehend the underlying causes of such challenges to garner the support of all parties involved in resolving conservation and sustainability concerns.

2.2 Stakeholders Collaboration: Framework for Sustainable Tourism

Although there is no globally effective method for including stakeholders, many experts believe stakeholder collaboration is critical, with numerous benefits (Mustapha et al., 2013; Kunjuraman & Hussin, 2017; Su et al., 2014). However, tourism sustainability is challenging with several stakeholders and procedures. For nearly a decade, studies have tried to establish a sustainable tourism framework. A long-term sustainable tourism framework remains unfinalized because of the constant changes in the industry. For instance, Chan and Bhatta (2013) consider the factors that could delay sustainable ecotourism and resource conservation in Nepal and find that collaboration among stakeholders, particularly the local community, tourism industry, institutions, and government, was crucial.

Jamal and Getz (2000) emphasiz stakeholder collaboration for tourism sustainability. They note that a critical challenge in achieving a successful collaboration is building trust between stakeholders and recognizing a shared problem. Further, other scholars report that building trust in the community is crucial for long-term collaboration success while creating awareness of the implications of increased government involvement (Roberts and Simpson, 2000). The studies show that stakeholder collaboration is the initial



Figure 2. A three-phase framework for the collaboration process Source: Gray (1996)

step to ensuring participation and shared learning is structured at a destination. This study explores a few models in the literature to propose a stakeholder collaboration framework for PHBR. The first model stems from Gray (1996) (see Figure 2). The three-phase framework shows the importance of problem identification, direction-setting, and collaboration.

Further, Cullen et al. (2010) propose essential criteria for evaluating the collaborative planning approach among stakeholders, which comprises two elements: the process and outcome of collaboration. Conley and Moote (2003) argue that it is an innovative approach to managing natural resources. In this case, the collaboration process has six criteria: inclusive representation, voluntary participation and commitment, equal opportunity and resources, principle negotiation and respect, time limits, and effective process management. Meanwhile, the outcomes of collaboration include six criteria: perceived as successful; conflict reduction; knowledge, understanding, and skills; information; second-order effects (the process contributes to changes in behaviors and relationships); and understanding and support for a collaborative approach. Accordingly, researchers address the usefulness of applying the criteria to explain a collaborative approach on multiple stakeholders with significant differences in values, cultures, and legal entitlement.

Graci (2013) focuses on establishing collaboration and partnerships to implement sustainable tourism. Many locations have made strides toward sustainability but have been hampered by a lack of stakeholder participation. Multi-stakeholder partnerships can efficiently bolster tourism development projects, which can be achieved through collaboration. Selin and Chavez (1995) propose five partnership phases to overcome challenges and achieve sustainability (See Figure 3). They highlight that collaboration via different phases (e.g., antecedent, problem-setting, direction-setting, structuring, outcome, goal-setting, and problem-solving stages) through partnership development among stakeholders induces sustainability. Therefore, studies should consider the factors related to stakeholder collaboration and stakeholder partnerships to enhance tourism sustainability.



An Evolutionary Model of Tourism Partnerships



Pasape et al. (2013) also highlight the importance of stakeholder collaboration to achieve sustainability in Tanzania (See Figure 4). They explore the importance of stakeholder strategies toward sustainability and note that stakeholder networks and partnerships between public and private sectors induce better stakeholder collaboration. Stakeholders were involved at local community levels and key stakeholders managed the destination. However, the level of engagement remained lower than expected. One reason was public-private partnership disagreements, warranting the need for creating collaboration strategies that align with the primary stakeholders' interests for better collaboration toward sustainability at a destination.

Osman et al. (2018) examine the extent to which greater stakeholder collaboration during ecotourism planning can be applied in practice (See Figure 5). Ecotourism is a subset of sustainable tourism and is among the emerging tourism sectors. They note that primary and secondary stakeholders are key to achieving sustainability and that collaborative planning should be between such stakeholders. It is necessary to employ suitable strategies throughout the planning process to encourage an active exchange



Figure 4. Stakeholder collaboration framework for sustanaible ecotourism Source: Pasape et al (2013)



Figure 5. Collaborative planning for successful ecotourism development Source: Osman et al., (2018)

of information and perspectives for stakeholder engagement to be successful. There is no foolproof strategy for determining how to involve stakeholders at various points in the process. It is contingent upon various elements, including the nature and scope of the engagement itself and the accessibility of necessary resources. Expecting effective engagement from stakeholders who have long been marginalized is impractical given the goal to ensure effective decision-making inputs. Collaborative planning can be achieved through appropriate stakeholder engagement strategies and network building. Stakeholders' commitment and support could be achieved through this process, ultimately inducing sustainability at the destination.

Gracy (2012) and Osman et al. (2018) also propose stakeholder networking as a crucial part of stakeholder collaboration. Despite many stakeholder networks, they show that participation in ecotourism management is minimal. Additionally, statistical data shows neither well-known nor official public-private collaborations in sustainable tourism such as ecotourism activities. This reality contributes significantly to a lack of sincerity and ownership among stakeholders, which threatens the development and promotion of sustainable tourism in the destination.

Furthermore, Wondriad et al. (2020) assess stakeholder collaboration strategies toward sustainable tourism in Ethiopia through stakeholder networks and private partnerships (See Figure 6). This comprehensive framework posits specific stakeholder involvement and identifies their role in discussing



Figure 6. Stakeholder collaboration framework that boosts collaboration and facilitates sustainable ecotourism development Source: Wondirad et al. (2020)

multiple issues surrounding the ecotourism sector. The concerns highlighted in the framework are environmental conservation, cultural uniqueness, destination competitiveness, fairness, collaboration, economic viability, and social responsibility. They argue that stakeholders should accept and work toward similar objectives regardless of their interests. The framework also encourages regular monitoring and evaluation of economically viable, environmentally sustainable, and socially responsible ecotourism.

Although collaboration offers a dynamic and strategic mechanism for solving issues regarding diverse stakeholder involvement in various disciplines, diverse and multiple stakeholders who often hold widely different viewpoints and strong vested interests complicate the outcomes. Consequently, a collaborative solution is challenging to attain given the differences in value orientation between stakeholders (Gray, 1989). Therefore, it is crucial to develop strategic mechanisms to enhance stakeholder collaboration based on the local context by understanding its domains, collaborative issues, and stakeholder involvement.

3. Methodology

This study proposes a stakeholder collaboration model. It collects data from July through August 2022 to assess stakeholders' role in preparing a five-year UNESCO-requires PHBR management plan (2022–2026). The study employed three approaches: workshop and focus group discussion with stakeholders (including



Figure 7. Photos indicate the workshop conducted with the stakeholders: (Photo one: workshop with public and private agencies and Photo two: workshop with the local communities and businesses)

public and private agencies), semi-structured interviews with the management of the three destinations in PHBR (PH Corporations, Penang Botanical Garden [PBG], and Penang National Park [PNP]), and a focus group discussion with local communities and tourism businesses. Figure 7 shows the activities during the data collection. Data was analysed using content analysis. This research is a continuity from an internal university grant approved in 2018. The participants of the study provided written/oral informed consent to participate in the study. This study was approved by the USM Human Research Ethics Committee of USM (JEPeM), registration number: The Federalwide Assurance (FWA): FWA000024213 and the Institutional Review Board (IRB):IRB00010568, dated 13 December 2018.

Eco park	PH: Adventure trail, nature walk, and monkey cup garden PBG: Recreational and leisure PNP: Meromictic Lake, Tanjong Kerachut, and Muka height Jungle trekking is available for the three destinations.
Culture and heritage	PH: Colonial building (Crag Hotel, el Retiro and Gate House), owl museum, Toy Museum, Earthquake pavilion, Bukit Bendera Mosque, and Kuil Si Aruloli
Family entertainment	PH: Skywalk, Skydeck, El walk, Love lock, little village, Dinasaur and Aviary Garden, Henna Spa PNP: Camping, jungle trekking, and bird watching Outdoor activities: Kayaking, flying fox, wall scaling, and abseiling Other attractions include Taman Rimba, Teluk Bahang Dam, Tropical fruit farms, Spice garden, escape, Eutopia
Gastronomy	PH: Any kind of local food such as white peanut (Kacang Putih), Ais kacang, and western food PNP and PBG: Local food
Research and Education	PH: The Edgecliff gallery (showcases Penang Hill's history, culture, and biodiversity) PBG: Plant species and conservation PNP: Interpretation center

Figure 8	. Unique att	ractions i	n the surrou	nding areas	of PHBR; P	H—Penang	Hill, PBC	G—Penang	Botanical
	Garden, PN	√P—Penar	ng National I	Park, BC—					

4. Results

Originally, PHBR spans three destination attractions—PH, PBG, and PNP—governed by different agencies and departments with unique objectives, responsibilities, policies, and enactments. The two main areas of PHBR are PH and PBG, situated in the Northeast District. PNP is located in the Southwest District. For the buffer and transition zone, two groups of communities are involved with PHBR: farmers who live in PH and fishermen who live near PNP. PBG has no specific local community engagement; however, it has daily visitors (joggers), tourists, business operators, and NGOs. Figure 8 highlights the unique attractions surrounding PHBR. Figure 9 presents actual photos of PHBR.

PHBR aims for "a sustainably managed region that is enjoyed and protected by all." A biosphere reserve management plan is a requirement by the Statutory Framework of the World Network of BRs (Article 4.7.b). BRs should involve all relevant stakeholders in planning and decision-making and provide training for meaningful participation. Figure 10 presents the proposed Management and Coordination Structure of PHBR, which is a top-bottom approach. Based on the structure, stakeholders are classified under four managerial levels. The first level comprises the Ministry of Energy and Natural Resources under the Malaysian federal agency, which reports directly to UNESCO. The second level comprises the executive



Figure 9. Three tourist attractions at PHBR (Photo one: Penang Hill, Photo two: Penang Botanic Garden and Photo three: Penang National Park)

committee (EC), which plays a major role in the management of PHBR. The EC is a decision-making body under the state government to ensure the achievement of PHBR objectives. The key stakeholders are Penang State Government members and a selected coordinating committee member. The CC members are other key parties to the UNESCO nomination, including the three responsible parties of main tourist attractions, public and private agencies, and the higher education institution (represented by Universiti Sains Malaysia). These parties are directly involved as a steering committee to ensure the achievement





of PHBR sustainability. The last part is the Expert Advisory Panel—private and public organizations, local community, and businesses, including NGOs—which provides bottom-up information or issues for better PHBR management and conservation.

From the three research approaches, two types of issues emerge: institutional and local. Institutional issues include the following:

- 1. There is no institutionally recognized multidisciplinary or multisectoral coordination mechanism. Involving multiple government agencies in an administration must be effectively coordinated under the PHBR umbrella.
- 2. PHBR involves different destination management agencies: PH, PNP, and PGB. Thus, it can be challenging for stakeholder management to ensure efficient management to meet PHBR objectives.
- 3. There are no synchronized and organized mechanisms and policies, negatively impacting PHBR management. The existing legislative framework guides the planning and management of the PHBR. Such regulations highlight agencies' overlapping and, at times, conflicting roles and responsibilities in managing PHBR destinations.

The local issues are explored based on focus group discussions from different sessions. They regard the following:

- 1Biodiversity conservation: Overuse of certain hiking trails induces erosion, habitat degradation, pollution, and illegal human activities
- 2. Heritage conservation: Heritage buildings not properly maintained
- 3. Environmental degradation and pollution, such as climate change, landslides, and polluted water supply: Seawater warming, acidification, and anoxic areas affect the ocean and coastal waters
- 4. Sustainable socio-economy: Limited socio-economic engagement among the local community
- 5. Awareness, outreach, and education: There are no structured programs coordinated by destinations in PHBR.
- 6. Sustainable tourism development: There is a need to control mass tourism and enhance responsible tourism.

5. Discussion

Based on the previous studies and proposed frameworks, the Management Plan for the PHBR must establish a temporary organizational structure and a clear vision and mission under the umbrella of PHBR. Figure 10 presented the structure of stakeholder management per their level of involvement

Previous studies (Gray, 1996; Selin & Chavez, 1995) show the importance of identifying issues or barriers related to sustainable destinations. Such issues must be prioritized, as they may affect the implementation of programs to achieve PHBR sustainability. Studies also propose the importance of collaborative planning (Pasape et al., 2013; Osman et al., 2018) and detail key stakeholders' roles in sustainable



Figure 11. A proposed stakeholder collaboration framework for the PHBR.

ecotourism destinations (Wondriad et al., 2020). Thus, the framework also emphasizes the importance of these steps: organization setting, direction-setting, coordination and implementation, and monitoring activities, programs, and impact. The establishment of a management structure needs strong stakeholder collaboration, which can be realized via stakeholder interaction, network, and partnership. Figure 11 presents the proposed framework for the PHBR stakeholder collaboration. This framework has limitations as the actual management and coordination structure is still pending approval.

6. Conclusions

This study is conducted nine months after UNESCO's acknowledgment of PHBR as a MAB site. One year after the recognition, PHBR must prepare its five years management plan to indicate its vision, mission, and strategy to achieve the PHBR recognition objective. Therefore, this study is timely in that it furnishes insight into stakeholder roles and collaboration toward planning, management, and implementation of activities for PHBR sustainability. As part of the PHBR management plan team, we have good cooperation with all three destination managers and key stakeholders (public and private agencies) in identifying issues related to PHBR.

Prior studies provide a few frameworks for sustaining ecotourism or biosphere sites worldwide. They identify issues and the need for proper stakeholder management and a structured management system to coordinate all activities at PHBR destinations. Given the existing situation in PHBR and the proposed PHBR five-year management plan, this study proposes a stakeholder collaboration framework for the PHBR. As the management plan is pending approval and actual implementation, we consider this framework is temporary. Further studies can examine the framework in-depth after the implementation and adoption of the five-year PHBR management plan. We hope to provide a fundamental framework for a stakeholder collaboration specific to PHBR, as conducted in Egypt and Ethiopia.

Concerning the framework, the improvement can be considered regarding quality circle control, where the impact of any program or activities must be assessed to ensure the achievement of the objective. Moreover, bottom-up information is critical and should be thoroughly discussed among the related stakeholders, especially regarding socio-economic matters. The involvement of fishermen and farmers as part of the PHBR committee should be enhanced and measured. Another limitation is that this study has not touched on the behavioral aspect of stakeholder collaboration, such as lack of trust and conflict of interest, as the implementation of stakeholder collaboration remains pending for a new management structure of PHBR.

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Post-Disaster Rebuilding via Intangible Heritage Restoration: A Micro-Human Efforts-Based Approach

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Abstract

Although preserving tangible materialistic heritage is essential, the restoration of traditional knowledgeand skills useful for post-disaster rebuilding has not yet been investigated fully. Further lacking is the potential of micro-human efforts (MHEs) as an alternative post-disaster rebuilding methodology. Thus, this study investigates specific individual capacities that assist cultural heritage restoration for sustainable recovery after climate-induced disasters. It focuses on MHEs that develop into collective measures and the establishment of a new status quo. The study proposes a multidisciplinary approach to harness a holistic understanding of the critical components of an intangible cultural heritagerestoration-based recovery model. The model capitalizes on MHE to potentially yield enhanced protocols, policy recommendations, and best practice proposals. The objective is to streamline intangible cultural heritage as an integral part of collective efforts toward long-term sustainability. Critical interpretations via a meta-analysis revealed a three-fold streamlining process that utilizes a strategic, regenerative, and transformative methodological tool for sustainable post-disaster rebuilding.

1. Introduction

Identified as self-work or self-installation in the literature, intangible cultural heritage (ICH), a rudimentary form of micro-human efforts (MHE), can impact post-disaster recovery positively. When used for rebuilding after climate-induced disasters, vulnerable communities significantly benefit from ICH as it uses their generational know-how. What is lacking in the research is how MHE-based self-work concepts suchas self-labor engage local knowledge directly. Unlike other types of disasters, communities know much about climate-induced disasters and ways to live and learn from them. Hence, the proposed project aims to createan efficient intangible resource mobilization model for fast and robust rebuilding.

In the process, it consolidates isolated generational know-how to deliver a redevelopment role model for vulnerable communities in traditional disaster-prone settlements in the Indo-Pacific region. This adaptable regional model would allow such communities to use their understanding of local climate and resources for disaster resiliency.

Engagement of individual capacities or MHE in cultural heritage restoration is not entirely new but is challenging and lacks direct derivatives. Hence, the worth of the cost-effective self-installation via MHE for post-disaster recovery is often overlooked. While evidence of self-installation benefits and post-disaster recoverythrough intangible cultural know-how restoration is independently available, little is known about MHE, such as self-labor in post-disaster damage assessment and recovery that promotes emotional and economic outcomes. Therefore, this project should significantly advance the field of intangible heritage restoration specific to disaster rebuilding. Until this information is available, it will be challenging for stakeholders to negotiate a robust program with the evacuees for holistic recovery, long-term resiliency, and overall sustainability.

This study hinges on well-established constructivist theories about naturalistic inquiry. Thematically, it consolidates multidisciplinary literature that reports on evacuees' latent yet strategic socio-cultural interventions. Pilot studies yielded repetitive themes when a hybrid of multidisciplinary research methodologies was employed. Widely used in climatology, cultural anthropology, human ecology, disaster epidemiology, and microeconomics, the methods used in this study enable diverse perspectives to emerge, as exhaustive coding focuses on finding useful links to reinstall specific human capacities regarding rebuilding. The findings should streamline a process to restore intangible local know-how, progressively build new capacities, and produce a model for resilience against climate-induced disasters. The expected outcome of this project will further be used to test effective MHEs to produce a sustainable rebuilding model that clearly defines and integrates MHE via

- 1) a multidisciplinary online database
- 2) an instructional component
- 3) an educational program for diverse geospatial conditions. However, this portion of the research only addresses (1) and (2) partially.

2. Literature Review

As one in every 113 people globally is now displaced, the overall impact of the magnitude of disaster damage on the general human condition is immeasurable (Edmond, 2017). According to the Disaster Reporting Centre-Report 2018, the Indo-Pacific region alone hosted 8.6 million displaced persons given a sudden onset of disasters in 2017, accounting for 46% of the global total (IDMC, 2018). While extant analyses of recurring natural disasters have remained repetitive and stagnated, climate-induced disasters occur and have significantly increased the number of perpetually displaced communities. The multifacetedness of this issue highlights a need for holistic or alternative approaches to empower

impacted communities to effectively coordinate the capacities of individuals to address the everincreasing complexities of recovery programs (Wu & Hou, 2019). The pilot research revealed apparent hesitations among communities to participate in disaster recovery, as they lacked direct routes to reach out. Hence, it curtailed effective stakeholder communication to integrate personal capacities into readymade approaches. While readymade rebuilding programs underwhelm vulnerable communities, atomistic approaches overlook the complex nature of individual capabilities and, thus, limit people's creative capacities (Centemeri, Burgess & Topçu, 2021). Therefore, they exclude individuals from taking charge of their recovery process (Subasinghe, 2012, 2013).

It has been established that individuals can integrate humanitarian actions to embrace sustainable development opportunities and build resilience (Crété, Selter, Romão, & Paupério, 2018). Although related research independently covers individual capacities in specific phases of disaster recovery, it does not discuss human health and wellness, housing and livelihood options, and access to recovery information and programs perspectivesholistically. Consequently, it raises a need for an individual effort-centric model of recovery that invests in humbleyet robust psychophysiological efforts of individuals that could contribute to a compelling, collaborative whole. Such efforts have proven particularly profound for ethnic minorities with intangible heritage, which address societal issues via resilient rebuilding (Kitamura, 2021; Wu & Hou, 2019). Traditional settlements in disaster-prone sites in many Indo-Pacific regions provide powerful examples of such knowledge that assist communities to "bounce back better" by rebuilding buildings and community pride (KC, Karuppannan, & Sivam, 2019). Even though unskilled lay people, including indigenous people in such settlements, carry some cultural capabilities practiced through iterative processes, there are no in-depth studies on why disaster recovery programs remain distant from people's know-how (Engel, Frerks, Velotti, Warner & Weijs, 2014).

In 2003, the ICH term was established by UNESCO as a recognition of traditions or living expressions and traditional knowledge and skills inherited from human ancestors and passed on to descendants (UNESCO.a, 2021). ICH's role in maintaining cultural uniqueness in the rapidly globalizing world has been equally recognized as a way to retain and restore time-tested problem-solving. Although the value of ICH in supporting sustainable development is widely acknowledged, it has not been integrated with disaster recovery, particularly from the MHE tangent (Debarbieux, Bortolotto, Munz, & Raziano, 2021; Smith, 2015). However, the ICH tangent promises an interactive, dynamic, inclusive, and cohesive social tool to work with evacuees, though it has not been given its due importance (Livizatou, 2016). The virtue of this generational heritage is its susceptibility to influence change as it impacts its creators and curators via their direct transactions over time. Hence it provides identity and continuity to communities in nurturing cultural diversity and human creativity (UNESCO.b, 2021, Monova-Zheleva, Zhelev, &Nikolova, 2020). Nevertheless, given its constant evolution, a consequence of the living practices that characterize ICH has been somewhat neglected in theory and practice (Kirshenblatt-Gimblett, 2004).

This study employs a broad definition based on immaterial cultural heritage to delve into CH-based

disaster rebuilding strategies, informally adopted by traditional settlements in many parts of the world. People living in disaster-prone sites carry specific mechanisms to cope, bounce back, and use rebuilding as a methodology for their psychophysiological recovery (Subasinghe, Sutrisna, & Olatunj, 2021). Such mechanisms include self-organization of resources, such as self-work regarding debris removal, reuse, repurposing, and recycling toward rebuilding. Regarding rebuilding buildings, small efforts support restoring know-how heritage, which they typically cannot undertake under normal circumstances, as they may demand extended time and resources. However, there is a lack of research on the direct link between MHE and disaster recovery, mainly regarding how affected individuals contribute to collective efforts to battle against disaster consequences via small efforts. Existing research highlights a synthesis gap among different recovery concepts, dimensions, and influences (Johnson & Hayashi, 2012). It hints at why multidisciplinary research is almost impossible within humanities, let alone other disciplines, such as environmental psychology, human ecology, economics, and basic sciences. Using MHE-based methods, this study synthesizes the latest knowledge on individual capacities by enabling multidisciplinary research to find overlapping and intersecting links (Subasinghe, 2020). The overarching idea is that vulnerable communities' post-disaster know-how could be streamlined to restore ICH toward enhanced rebuilding outcomes; for example, using self-labor in building transitional housing and achieving emotional and economic benefits for evacuees, investors, and managers (Subasinghe, 2012, 2013). Once which and how such efforts promote rapid social mobility, following recovery outcomes, are determined, it will be possible to incorporate the features in future environmental management and rebuilding design to deduce dependency and influence resiliency. However, existing research has not yet unbundled what specific small efforts of individuals contribute to the collective and, thus, the overall sustainability of rebuilding programs.

3. Methodology

The study investigates three-fold issues regarding the intangible heritage restoration-based approach to post-disaster rebuilding:

Why are disaster recovery programs still distant from the affected people who know how to handleselfrecovery to an extent

How do the affected people address disasters using their ICH?

What specific small efforts of the affected individuals contribute to sustainable post-disaster rebuilding toward resiliency?

As the above needs varying degrees of isolated pieces of understanding from multiple disciplines, the study employs (A) multidisciplinary strategies (skillful planning in setting objectives), (B) mixed methods (skillful ways of implementing objectives), and (C) hermeneutical tactics (skillful moves for achieving objectives) as the instruments. Although mentioned sequentially, it may or may not work in a particular order; it most likely works in a hermeneutic spiral (Figure 1). The methodological strategy employs multiple

disciplinary goal-setting under the thematic umbrella of MHEs (Morton, Eigenbrode, & Martin, 2015). Metaanalysis draws on qualitative and quantitative research on MHE to investigate diverse perspectives and uncover relationships among the three multifaceted research questions. The hermeneutic tactics allow for augmenting in-depth insights into specific MHE attributes produced through systematic interpretation processes, which allows for functioning bilaterally in the world. According to Taylor (1985), hermeneutics allows the knowledge necessary to navigate the world as a self-interpreting being; thus, humans are beings for whom things matter (Taylor, 1985). Although it does not seek power over its subject matter, the hermeneutic paradigm is partially dependent, as through interpretations of evacuees and distilled in fourfold status forms (Figure 1):

Long-practiced cultural norms of communities or individuals (core) Contested through continuous trial and error without outside involvement (critical) Systematically progressed through outside influences (responsive) Rejected, disappeared, or abandoned (reactive)

From Figure 1, a continuum of oscillations between interpretations and reinterpretations enables a process of understanding MHE critical to the intangible heritage restoration approach. As understanding requires the engagement of researcher biases (Schwandt, 2000), it is critical to avoid reproductions of understanding via an interpretively discursive process (Gadamer, 1981; Schutz, 1964; Taylor, 1985). The multidisciplinary understanding expected in this study is multilayered and dynamic, interactive and experiential, historical and political, and social and cultural (Reible, H. L., 2013).



CONTEXT: reactive practices abandoned in the process

Figure. 1 Methodology in instruments (A), (B), and (C) and how intangible heritage could be distilled through interpretations. In the process, (3) has the potential to achieve (1) status (source, author).

4. Findings

Initial findings stemmed from a systematic content analysis via meta-analysis on Google scholar, ProQuest, Scopus, and Web of Science databases that yielded different themes, concepts, and references to interdisciplinary notions of the Multidisciplinary Micro-Human (MH) universe. The following tabulation was distilled to establish specific MH traits potentiallydeplorable for intangible heritage restoration. This tabulation deductively demonstrates how MH concepts are explored specific to intangible heritage. "Culture" was used as an alternative to heritage when "heritage" does not turn any keyword results. If results turn out for "heritage" and "intangible" in the same search, then separate searches for two terms were abandoned. Instead of heritage, the term assets was attached to "intangible" for some MH aspects. Only the literature with intangible heritage or assets was used in the following steps to instigate post-disaster rebuilding. Some exemptions, including "intangible," were used in isolation without direct reference to heritage when MH is secondary to the query. Figure 2 illustrates a summary of multidisciplinary links, lapses, and overlaps among domains.



Figure 2. Multidisciplinary links, laps and overlaps among ICH domains related to MHE (Source: author)

5. Discussion

The MH cues and codes related to intangible assets summarized in Table 1 were used to run a focused review of post-disaster rebuilding. MH codes are quite prominent in systems and management and less significant in trials and clinical processes. It indicates the lack of emphasis and gap in the area requiring

Domain	Micro-Human	Heritage	Micro-Human (MH) themes	intangible	Heritage themes				
	Geography	Mitchell, R. E. (2019). Ordered Life in Individual Shtetlach, Towns and Cities. In Human Geographies Within the Pale of Settlement	The MH Geography of fa typology and a range fo for life for Jews who	amily space within ind or individuals. Why are move within and flee	dividual residences; a e cultures not prisons from their places?				
Theory, Activism, & Discourse	Experience	Hanaki, T. (2006). Transformation of self-identity through intercultural experience: Stories of self from Japanese students in a United States Midwestern university.	Shift macro-social reality to discuss the MH experience in a highly industrialized society, where people are constantly flooded with a massive amount of information and urged to communicate with others. The emergence of multiple self-identities and transformations of those identities as we move across cultures and interact with culturally different others.	Reible, H. L. (2013). Walking as knowing: an interpretative phenomenological analysis of leisure in the lived experience of urban walking.	Knowledge is understanding that begins in an MH experience. Understanding is temporal and processive and subverted and illusory.				
		Araborne, A. (2017). African Women as Mothers and Persons in Rhetoric and Practice: A Critical Study of African Womanhood, Maternal Roles, and Identities in Theological and Cultural Constructs in the Roman Catholic Tradition.	A specific event or ex deepening the analysi ur	perience embodies a s of a particular conte niversal perspectives.	universal value by ext to arrive at more				
	Environments	Cook, J. A. (2015). Social structure and livelihood adaptive strategies of urban farmers in response to land use change along the Yamuna River in Delhi, India.	Collaboratively, cities and planning organizations could innovate solutions to strengthen livelihood strategies of vulnerable and marginalized populations at the micro-level. The value of bottom up approaches to identify barriers to community participation, improve community engagement, and achieve more sustainable outcomes has been highlighted.						

<tab< th=""><th>ole 1> Tabulate</th><th>d and codified meta-ana</th><th>lysis of MHE themes or</th><th>intangible heritage</th><th>literature</th></tab<>	ole 1> Tabulate	d and codified meta-ana	lysis of MHE themes or	intangible heritage	literature

Domain	Micro-Human	Heritage	Micro-Human (MH) themes	intangible Heritage themes							
	Environments	Panneels, I. (2019, September). Mapping the Sea on Scotland's Peripheries	Respect, preserve, and maintain knowledge, innovations, and practices of indigenous and local communities embodying traditional lifestyles relevant to the conservation and sustainable use of biological diversity	Panneels, I. (2019, September). Mapping the Sea on Scotland's Peripheries.	Fishermen's knowledge of the sea offered a more complete understanding, having practical and emotional power. The fishermen know sustainable practices of fishing embedded in evolving language of place names (stock endangered and should be left alone).						
		No intangible or/and he Attributes; (eritage literature was fou Operations; Rights; Conte	nd on MH Arts; Servie exts; Actions	ces;						
Theory, Activism, & Discourse	Communities	Georgieva, N. (Ed.). (2019). International Conferenceon Technics, Technologies, and Education. In Intercultural communication challenges in modern higher education institutions. ICTTE.	Communication is an exchange of meaning between individuals through a common system of symbols (signs); it is a way and, at the same time, a condition for the existence of any macro- or micro-human community								
	Complexities	Roberts, S., Connerton, P., & Simmel, G. (2007). Order and the evocation of heritage: Representing quality in the French biscuit trade. Order and disorder	The authenticity of products as heritage objects linked to local cultural tradition (linking productsto a mythical, arcadian past on a visual level). Local cultural heritage is drawn on for presentational purposes. The workers make products for marketing, a representation of heritage								
	Objective Levels	O'Brien, E. (2007). Exploring community leveldispute resolution in Limpopo, South Africa.	The consultative culture African governance. It w ۴	as heritage had been vas nowforsaken for s political legitimacy.	the underpinning of urvival and so-called						
	Scale	Telafici, M., Martinez, M., & Telafici, M. (2014). East of West Rearguing the Value and Goals of Education in the Gulf.	Conflicts between Individualism and collectivism where dominant cultures unpack and establish their practices and, thus, the disappearance of minor cultures.	Knueppel, G. (2010). Sensory spatiality: tangible and intangibledynamics ininterior architecturaldesign.	Intangible conditions of spatiotemporal environments shape humanoccupation, movement, and social interaction.						

Domain	Micro-Human	Heritage	Micro-Human (MH) themes	intangible	Heritage themes							
Discourse	Scela	Ursic, M. (2019). Inadequate adaptation of creative city paradigm? Taiwanese	Gaining sufficient legitimization potentialfrom the most	Rooke, A. (2007). Navigating embodied lesbian cultural space: Toward a lesbian habitus.	Subtle moments of creativity and festivity:lesbian life on an MH scale: emotion, bodily experience, practical knowledge, and the way lesbians live thespaces of the city.							
Theory, Activism, 8	Scale	led urban regeneration policies through the eyes of urbandevelopment experts.	enhance the long-term quality of life in specific locales.	Ferreira, M. E. P.D. C. (2014). Reconceptualising public spaces of (in) equality: Sensing and Creating layers of visibility.	Exploring potentialities of geospatial online practicesto provide alternative possibilities for citizenship and fostering social change are vital to reconfigure public space.							
	No intangible	or/and heritage literature Rela	/and heritage literature was found on MH Mobility Patterns; Relationships; Dynamics; L Relations; Emotions & Expressions									
	Sphere of the Individual	Leung, J. P. (1998). Emotions and mental health inChinese people.	Daoists are devoted na of the individual is close naturally occurring even	turalists, and they be ely related to and inev nts such as star move changes.	lieve the MH sphere vitablyinfluenced by ements and weather							
Inquiry, Impact, & Agency	Performance	Booher, H. R., & Rouse, W. B. (1990). MANPRINT as the competitive edge. In Manprint (pp. 575-594). Springer, Dordrecht.	Contrasts two types of human performance data banks as repositories of human factor information: Macro (design or adaptation of all manpower, personnel, training, and organizationalcomponents of the system) and micro (design of the interface between the hardware, the person or the design of specific tasks).									
		Pérezts, M., & Picard, S. (2015). Compliance or comfort zone? The work of embedded ethics in performing regulation.	Ethnographic methodologies commonly used by "old" institutionalism privilege both holisticapproaches and a focus on MH agency. The issue of human agency raises questions of how actors involved in regulation and compliance work, interpret struggle, and <i>in fine</i> manage toimplement regulation while often being perceived as constraining firms'activities.									
	Agency	Adu-Febiri, F. (2017). Reclaiming, restoring, andregenerating indigenous lifeworlds: a human factor competency perspective. Journal of Gleanings from Academic Outliers, 6(1).	The Interactionist paradigm emphasizes the importance of individual or MH agency but focuses on human capital at the expense of Human factor competency. These sociological paradigm biases limit the utility of their proposed strategies like litigation, negotiation, legislation, anti-racism advocacy or education, protests, and militant confrontations—to effectively fight Indigenous marginality.									

Domain	Micro-Human	Heritage	Micro-Human (MH) themes	intangible	Heritage themes								
/, Impact, & Agency	Agency	Steer, M. (2022). Mendelssohn on the Edge: Memory, Agency, and National Belonging in Weimar Germany.	The theory of structuration stresses dialectically interlinked dichotomy between (micro) human agency and (macro) social structure. This mutual co-dependence is called "duality of structure."										
Inquiry	No intangible	e or/and heritage literature Sensors; M	was found on MH Cente ovements; Thermal Com	ered Perspectives; Pos fort Sensing	stures; Will & Ability;								
	Beings	Rangkuti, S. S., Sirait, S., & Soehadha, M. (2021). Accommodation of Islamic Education Responding toLocal Culture.	MH beings have many differences, physically and intellectuall (desire,mindset). Emphasizes the process of getting to know each other between educator and disciple. Scientific heritage in the golden era of Islam was inherited without anydevelopment, criticism, and re-enactment of it.										
Concepts and Ideologies	Body	Gogoi, N. (2019) A critical study on the manuscript paintings of Assam: With special reference to Chitra- bhagawata and Anadi- patana,	MH body is the reflect as nine doors in the h of the energies called	dy is the reflection of the macro universe; sense org doors in the human body; the six plexuses and the fl e energies called <i>Vayu</i> , flowing inside the human body									
	Cosmos	Satsangi, P. S., Hameroff, S., Sahni, V., & Dua, P. (2016). Consciousness: Integrating eastern and western perspectives. Motilal Banarsidass.	Spiritual heritage: discusses Indian philosophies that developed sciences of consciousness.										
	Ties	Murakami, Y. (1990). Two types of civilisation: Transcendental and hermeneutic.	Religion not only aimed at the salvation of individuals but also acted as a guide for every personin his relationship with others, from the macro-political order down to MH ties. Chineseheritage (Confucian legacy) seems to be characterized by a capacity for hard work, zest for education, devotion to some type of group and, more generally, respect for social order and discipline.										
		Roberts, G. (2016). Mind CSLSI. In Working withChristian Servant Leadership Spiritual Intelligence.	Ideally, our macro worldview and MH conduct receive grounding upon the orthodoxy of belief, knowledge, and orthopraxis of action.										
	Conduct	Yaniv, A. (2019). Alliance Politics in the Middle East:A Security Dilemma Perspective. In The Middle Eastin Global Strategy.	Discusses an interpro a "macro" theory of ir interpretation, human for international an rationally compelled make assertive moves a	etation of "micro" hu nternational relations malevolence is not a archy. Leaders would by the absence of glc and, thus, contribute of anarchy.	man conduct into 6. According to this necessary condition I be logically and obal governance to to the intensification								
	Level	McGrath, S. J. (2006). Boe andthe hermetic	Asserts that the body is no lon obstacle to freedom on the Mł it must be renouncedvia the m spiritual self-realization. As Para										

perseverance in medicine makes clear, health now finds a new significance.

	Micro-Human	Heritage	Micro-Human (MH) themes	intangible	Heritage themes					
sses	Computation	Gingold, Y., Shamir, A., & Micro perceptual hum visual t	& Cohen-Or, D. (2012). nan computation for tasks.	Micro-human computation (MHC) design seeks micro-tasks (simple visua queries) that caninform a solution by a machine algorithm. Thus, a complex problem must be broken down into MHC tasks that can be distributed and solved very quickly.						
rial & Clinical Proc	Network Formation	Subramaniam, S., Almoq Canda, R., Othman, M., & A Wireless Sensor Netv Performance Analysis. Hybrid Information Tech	ry, M. A., Thavamani, S., & Zulkarnain, Z. (2010). vork for Field Hockey In Convergence and mologies. IntechOpen.	Field hockey red cohesive human mo and group dynam network formation the t	quires two main ovements: individual ics,meaning an MH of all 11 players on field.					
Tri	Reproductive Cloning	Bronsword, R. (2004). St wherethe regulator	tem cells and cloning: ry consensus fails.	Micro cloning for a Allow couples wl not eligible to use or parents who lc another child with mak	genetic connection. hose gametes are cloning technology ost a child to have n a similar genetic seup.					
Systems and Management	Systems	Rezaei Kolahchi, A., Kh Pezeshgi Modarres, H. Geraili,A., Jafari, P., & Sar Microfluidic-based mult drug dise	adem Mohtaram, N., , Mohammadi, M. H., hati-Nezhad, A. (2016). i-organ platforms for covery.	Discusses the adjustment of chemical concentrations in the perfusion medium in drug testing anddisease modeling. It reports on the major implications of sma fluid volumes in milli- or micro-human systems. For example, the injection of small volumes of precisely mixed fluids						
		Kearney, P. (2013). Th climatechange: clinical a Feedb	e systemic crisis of nd political reflections. back	Criticizes the clin literature embe paradigm of linea discourses choppi The momentum o extractivist entitle irresistible such th degrees of collu the human effo of that frame of inertia of commo practice. Highligl counterproductive, a of contemporary people fragmented conflict of ve	ical (and political) edded in the old ar causality, expert ng up the ecology. If this consumerist, ement paradigm is the paradigm is the it yields varying usion. Discusses rts to break out f constraints and erce, culture, and hts the repetitive, and divisive methods politics that keep d, polarized, and in arious kinds.					
		Reddy, G. V. (2020). Alayar Epitome of Hindu Culture	m the Hindu Temple: An e. Sri Ramakrishna Math.	Discusses the symbolized subtle truths regarding the functioning of a mass universal system andMH system in Hindu temples.						
	Processes	Korten, F., De Caluwe, L., future of organisation d studyamong D	& Geurts, J. (2010). The levelopment: a Delphi utch experts.	Mentions renewed interest in organizational development through MH processes-related topics such as coaching, training and development, and active listening.						

Domain	Micro-Human	Heritage	Micro-Human (MH) themes	intangible	Heritage themes						
Systems and Management		Wardhani, P. S., & Suprihandari, M. D. (2020). Developing Human Resource Quality Using Traditional Indonesian Puppet Characteristics.	It theorizes MH resources as a process of planning, education, training, and management of HR to optimize intended outcomes HR development inseparably involves human character. The development of character or culture is inseparably connected to traditional values that have underlined and raised it, including long-rooted mythological traditions. Recognized by UNESCO as an Oral and Intangible Heritage, puppets are loaded with values as those reflected on the characters of the puppet figures, stories or other supporting elements.								
	Resources	Galli, E. B. (2011). Existing Theory and Research. In Building Social Capital in a Multibusiness Firm	MH Resources Management covering the sub-functions of HR policy and practice (a) Employment relations and (b) Work & Industrial Relations.								
		Ployhart, R. E., & Hale Jr, D. (2014). The fascinating psychological micro- foundations of strategy and competitive advantage.	Although valuable, a fi management of such value capture and app and valuable, they may Inimitable and non-su competit	rm cannot own intan resources involves c ropriation. When suc y contribute to a com ubstitutable resource ive advantage sustai	gible resources. The omplex issues like h resources are rare petitive advantage. s may make such a nable.						
hent		Sharar, B. (2018). How should we conduct ourselves? Critical realism and Aristotelian teleology: a framework for the development of virtues in pedagogy and curriculum.	Markets as an emancip micro-human-capital need for education as and links it to economi new technology and	bating force paved the theories of education a life-enriching and d c growth, internation standards, and accou "value for money."	e way for variants of I. It emphasizes the esirable experience aal competitiveness, ntability based on						
Systems and Manageme	Capital	Kryscynski, D. (2021). Firm-specific worker incentives, employee retention, and wage– tenure slopes.	Positive interpersonal and compassi	work relationships, c on, and openness to	ultures of kindness, leadership						
		Mavridis, D. G. (2017) "Intellectual Capital Performance Aspects of the Japanese Industry," 8th Econometrics and Statistics Congress of Turkey.	Individual personal cap every person po	ital is the core or indi ssesses through birth	vidual capital which (MH capital).						

Domain	Micro-Human	Heritage	Micro-Human (MH) themes	intangible Heritage themes							
Systems and Management	Activities	Tsvetkova, A. (2021). Human actions in supply chain management: the interplay of institutional work and institutional logics in the Russian Arctic. International Journal of Physical Distribution & Logistics Management.	Discusses lack of interest in MH activities, although they are expected to have significant consequences for organizational ongoing operations and outcomes in day- to-day endeavors, which are often habitual, routine, or, in some cases, even unconscious. It highlights the causality, motives, and sense-making of practitioners' actions when performing daily ongoing operations by examining the MH activity level instead of the organizational level.	Discusses theories capabilities and inte intangible assets for non-substitutable st achieve competi	exploring human eraction as valuable, external actors, and rrategic resources to tive advantages.						
	Technology	Tam, K. F. K. (2016). Brand sustainability of manufacturing enterprises (MEs) and social enterprises (SEs) in Hong Kong.	Mention how 'MH Technology' could be extended to a range of products and expand the brand.								
	No intangi	ble or/and heritage literatu Knowledge; Circulato	ure was found on MH Va ry Systems, and Manage	riables; Settlements; (ement & Developmen	Drgans/Genome; t						

more efforts in identifying direct benefits for the psychophysiological health and wellness of evacuees through intangible heritage restoration. The tabulation also highlights limitations in research investigating the planning and application of post-disaster transitional settings and settlements to seize an opportunity to reestablish shaken societal norms and cultural core. Although disaster debris assessment and removal have been investigated under systems and management, it is unclear what impacts it might have on intangible heritage restoration, as it does not explicitly refer to skills at a higher level. For example, certain construction debris, such as rare species of wood, stones, earth, and crafted building components, need specific skills to spot, sort, and restore for rebuilding purposes.

The findings highlight a gap in the literature that prioritizes losses to ICH aftermath of disasters but sidelines ICH restoration as an effective methodology for post-disaster rebuilding. The problem largely remains in the poverty of discourse in recognition of various facets and modes of intangible MH heritage that some stakeholders are hesitant to acknowledge and integrate as useful post-disaster rebuilding

methodology. Moreover, symptomatic is the limitation in urban resilience literature, where the focus is on preservation and community participation but not on health and wellness by ICH restoration. This partially answers why disaster recovery programs are still distant from the affected people who know how to handle self-recovery to an extent. The second question was how the affected people address disaster recovery using their ICH, which largely lies in various emotive improvisations innovated on disaster sites. For example, local performing arts and rituals with situational twists have been used to alleviate evil spirits and receive blessings. Concerning the Indo-Pacific region, traditional performers use circumstantial dialogues with humor and authority to boost local morale. Such local festivities, musical instruments, and other tools recovered from the rubble tend to garner print and social media exposure. It tends to generate local and national interest and private backing and, thus, catalyzes social upheaval. The final guestion on specific MHE that contributes to sustainable post-disaster rebuilding heavily relies on the last three steps of the streamlining process. Advanced and adapted to changing circumstances at micro levels and scales, such efforts are time-tested tools that actively help locals reduce disaster risks and rebuild when necessary. Moreover, the aim is not simply to battle climate change but to promote better, less disruptive ways of adopting environmental living. Hence, MH-based heritage reinstallation minimizes the socioenvironmental costs of rebuilding. On the contrary, the exclusion of MH-based heritage reinstallation may cause catastrophic corruption of social integrity.

From Table 2, the streamlining of ICH for sustainable rebuilding programs requires a six-step process belonging to five multidisciplinary domains. The table further distinguishes how each multidisciplinary domain contributes to particular ICH components and gaps and lapses among steps and domains. It also demonstrates possible future research directions where no check marks are. For example, while lapses exist between steps 1–2 and 3–4, no research has been done on concepts and ideologies related to the first five steps of the streamlining process. The specific small efforts of the affected individuals that contribute to sustainable post-disaster rebuilding heavily depend on the last three steps of the streamlining process presented below.

6. Conclusion

As evident in the meta-analysis, post-disaster rebuilding MHE is a different type of ICH. MH in postdisaster rebuilding has dual contributions via a professional artisan and pseudo-professional. Furthermore, the use of MHE in ICH regarding post-disaster rebuilding has dual skill types: direct labor and training or emancipation. While direct labor works independently or collaboratively, training or emancipatory skills of individuals work through groups. For example, traditional events, festivals, and folk performances contain both components, which manifest via religious faith or amusement, boosting social welfare and regional economy. Figure 3 conceptualizes the methodological components and mechanism of MHE-based ICH restoration for post-disaster rebuilding. From Figure 3, this three-fold streamlining mechanism utilizes a

		Tł	neo	ry,	Ac	ctiv	ism,	, &		nqu	iry,	Imp	act,	&		S	yste	ems	&			Tria	ls &	Clir	nical			Cor	oncepts & Id			eologies
		1	2	13	3	<u>urs</u> 4	e 5	6	1	2	Ag 3	4	5	6	1	2	3	em 4	ent 5	6	1	2	3	4	5	6	1	2	3	4	5	6
Adaction of official	rescue strategies and management methods	ledge and <	recasting <	lier v	/				-																							
, total of the second sec	z. Identification of last- track disaster damage assessment tools	Integrate traditional know	skills related to disaster fo	and warning to disa	management					V	√	√	√	V																		
2 Idontification of	o. Identification of effective debris removal and sorting techniques										rial rescue, resource	ques into rebuilding			V	V	V	V	V	V												
4. Optimization for the	resourceful re-appropriation of disaster debris/ construction materials										Integrate traditional mater	and re-harvesting techniq									\checkmark											
5. Coordinated	planning and setting up transitional housing/ facilities	Integrate traditional	building and crafting and	events and performances	into renousing														Integrate traditional building and	cratting and events and performances into rehousing schemes												
	 Evaluation of rebuilding and resettlement options 																															Use successful outcomes from 1.2, 3,4, and 5 for permanent housing solutions.

<Table 2> Gaps and lapses in five steps of streamlining ICH restoration-based post-disaster rebuilding process.



Figure 3. MHE-based ICH restoration tool (source: author) process.

strategic, regenerative, and transformative methodological tool for sustainable post-disaster rebuilding.

However, time and resource-intensive, tacit knowledge values and practices of ICH have clear advantages over the resourceful use of regional resources without over-exploitation. When necessary, it further enables individuals in communities to better face natural disasters within their familiar ecosocial spheres. ICH in climate-associated displacement has not yet been fully integrated into disaster rebuilding strategies from a health and wellness perspective. This research mandates a scientific definition of intangible heritage for non-traditional urbancommunities that have not been recognized as careers or caretakers of traditional knowledge. However, these communities may potentially receive psychophysiological benefits by uncovering latent talents or learning-related skills to intangible heritage restoration.

Intangible heritage has direct benefits when used for formalizing training for post-disaster rebuilding. For example, employing traditional art forms and mythological characters to reintroduce intangible heritage relates to the craft of construction. However, a formal or informal organization cannot own intangible resources. The ownership of such resources involves equity issues like value capture and appropriation. Intangible resources may contribute to a competitive advantage when they are rare and valuable. This competitive advantage may be sustainable if such resources are inimitable and non-substitutable. Such ICH establishes human capabilities and interaction as valuable, intangible assets for external actors and non-substitutable strategic resources to achieve competitive advantages in post-disaster rebuilding. This research presents scope for future research as it has been done with several limitations, particularly in measuring health and wellbeing outcomes. The scope includes empirical studies on what, where and how the MHE-based ICH tool works well with different ethnic and socioeconomic groups.

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A Process Model for Architectural Heritage Values Assessment

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Abstract

Cultural values are common factors in almost every decision regarding the appreciation, conservation, and management of architectural heritage. Accordingly, the success of such efforts is accompanied by proper recognition, interpretation, and presentation of cultural values. Further, architectural heritage values are associated with a dynamic phenomenon comprising constant people-place-time interactions. Such complexity requires an assessment process that is adequately complex to consider many factors yet comprehensive, practical, and precise to ensure efficiency. Accordingly, this study develops a process model for architectural heritage values assessment. It applied the model to a case study to examine a tapestry workshop building at Ramses Wisa Wassef Art Center in Egypt. The model establishes a common ground that enhances assessment process management, increases its efficiency, and enables its improvement. Moreover, the model can support values assessment training and capacity building and may be used as an instructional tool for scholars and practitioners. The study verifies the process inputs, steps, and outputs of the model and sets general considerations to guide practitioners. The application revealed the validity of the process model, and its ability to manage a complex process comprehensively.

1. Introduction

The concept of "value" is a social construct.¹ It stems from widely formed sets of assumptions, beliefs, and knowledge that are socially determined cumulatively through the history of a society. Accordingly, the study of cultural values is imperative in heritage studies. They reveal the core characteristics that

¹ Janet Stephenson, 'The Cultural Values Model: An Integrated Approach to Values in Landscapes', *Landscape and Urban Planning* 84, no. 2 (2008): 127–39.

give identity and diversity to society² and, as per Marta De la Torre, are the main reason for heritage conservation. No community will conserve something with no value to them.

The architectural heritage values (AHVs) assessment is a complex process, given its association with the interaction between people, place, and time and the need for considering and judging heritage within the cultural contexts to which they belong.³ Such complexity indicates the need for studying values based on the characteristics and attributes of heritage and context. Considering the lack of similar local studies in Egypt, this study mainly develops a model for the AHV assessment process that integrate the international experience outcomes and represents the local perspective.

2. Literature review

Responding to the absence of literature about AHV assessment in Egypt, relevant literature were reviewed and its potential employment as an intellectual base examined. Many scholars note how values are attributable, multiple, mutable, incommensurable, and sometimes in conflict. ⁴ Some discuss value typologies and refer to how they overlap or may fail to reflect the nature and range of all values expressed by people.⁵ Moreover, pre-selected typologies may aggravate reluctance to articulate values not fitting into the scheme.⁶ Such issues yield decisions that are based on assumed rather than explicit values.⁷ Other studies reveal practical aspects, such as the need for multidisciplinary studies and the absence of commonly acknowledged procedures and tools that may be utilized in AHV assessment.⁸ The literature shed light on how the assessment process must provide a comprehensive understanding of attributes and context and provide a clear explanation of typologies if used, considering that some values may not be categorized, try to represent key stakeholder opinions,. Such considerations guided the development of a local methodology regarding Egyptian heritage.

² Gabriela García, Jorge Amaya, and Alicia Tenze, 'Cultural Significance: Linking Actors and Methods', in *Structural Analysis of Historical Constructions*, ed. Rafael Aguilar et al. (Springer Netherlands, 2019), 2053–61.

³ ICOMOS, 'The Nara Document on Authenticity' (1994).

⁴ De La Torre, Marta, "Values and Heritage Conservation." Heritage & Society 6, no. 2 (November 2013): 155–66.

⁵ Stephenson, 'The Cultural Values Model: An Integrated Approach to Values in Landscapes'.

⁶ Britta Rudolff, "Intangible" and "Tangible" Heritage - A Topology of Culture in Contexts of Faith', Heritage, Memory & Identity (Johannes Gutenberg-University of Mainz, 2006)

⁷ L. Harald Fredheim and Manal Khalaf, 'The Significance of Values: Heritage Value Typologies Re-Examined', *International Journal of Heritage Studies* 22, no. 6 (2 July 2016): 466–81.

⁸ Marta De La Torre et al., Heritage Values in Site Management Four Case Studies, ed. Marta De La Torre, 2005.

3. A Process Model for Architectural Heritage Values Assessment

Architecture is the sum of tangible and intangible expressions of human culture. Intangible expressions represent the ideas, values, beliefs, habits, and aspirations of their creators and users. Meanwhile, the tangible expression is the built product that combines art, science, technology, and craft. Architectural Heritage changes when understood in a holistic relationship. It is best realized when considering the related social needs, beliefs, and aspirations. Understanding the attributes and context is the key to revealing AHVs. Accordingly, the intellectual base of the AHV assessment process model may be summarized as follows.

3.1 Concepts and Definitions

An architectural heritage site is the spatial space of man and society's cultural interaction and the outcome of communal experiences. It includes values, art, sciences, knowledge, and activities.

Architectural heritage context is the past, present, and future conditions that affect the value of the heritage in which a site was constructed, used, appreciated, discovered, preserved, and presented.⁹

Architectural heritage attributes are the parts, components, qualities, and characteristics that can be categorized into the following:

- -The form includes the characteristics of the building and its urban contexts, such as formation, materials, and techniques.
- Associations are features from human connections with the site, such as the ideas of its creators, meanings, and historical and social relationships.
- Practices include customs, traditions, and rituals associated with the site or its function.

3.3 Process steps

The proposed process model assesses values by deconstructing the attributes, conducting interdisciplinary and contextual studies, and constructing significance based on values.

Figure 1. AHV assessment Structure. clarifies the process structure.

The steps of the process are as follows:



Statement of Significance

Figure 1. AHV assessment Structure

⁹ Bogusław Szmygin, 'How to Assess Built Heritage? Assumptions, Methodologies, Examples of Heritage Assessment Systems' (Lublin: Lublin University of Technology, 2015).
3.3.1 Inputs and data collection

The process depends on a wide range of information that may be collected through official documents, literature, studies, descriptive materials, photos, drawings, interviews, questionnaires, tests, and personal observations.

3.3.2 Identifying the Architectural heritage's components,

including i dentifying the scope of assessment regarding the key components:

- The Architectural Heritage Site
- The setting
- The Included objects
- The cultural context

3.3.3 Identifying Architectural Heritage Attributes

For each component, the attribute may be identified. Investigating the links between attributes and the cultural context will contribute to the AHS attribute's structure.

3.3.4 Values assessment (Values - Attributes Matrix)

The assessment of values is the core of the process. A preliminary value list may be established based on Interdisciplinary studies, contextual studies, and stakeholder interviews, setting clear definitions of each used typology to prevent as much overlapping as possible. For each attribute, values should be suggested. This step may indicate further needed expertise and analytical tools for the final assessment. This study proposes a value-attribute matrix (Table 1) to illustrate the value structure.

		Architectural He	Values					
		Form	Description of attribute	Historical	Social	Spiritual		
	Site	Associations						
		Practices						
	Settings	Form						
S		Associations						
Attributes		Practices						
	Objects	Form						
		Associations						
		Practices						
	Context	Form						
		Associations						
		Practices						

<Table 1> Value-Attribute Matrix

The value-attribute matrix represents the base upon which the site's significance will be determined. The matrix offers results in vertical and horizontal reading. The horizontal reading explains values according to attributes, and the vertical reading can sum up the sources of each value.

3.3.5 Output (Statement of Significance)

The statement of significance is the output and summary of previous studies; It should be a wellstructured and clear text that describes values according to attributes. The statement should clarify what each value means and to which attribute it belongs.

Case s tudy of the tapestry workshop building at the Ramses Wissa Wassef art center The study examines the tapestry workshop building at the Ramses Wissa Wassef Arts Center (RWWAC) in Cairo. The late architect established the center between 1952 and 1974¹⁰ to be a model to implement his philosophical vision about the innate creativity of children,¹¹ traditional art, architecture, and compatibility with nature.¹²



Figure 2. Historical photo for Ramses Wissa Wassef, His wife and Samiha on of the first generation artists in 1950s (Source : RWWAC Archive)



Figure 3. Interior views of the showrooms (By Author)

¹⁰ Tarek Waly and Shimaa Shaheen, أورام على المترام عن المعالي (Traditional Architecture as a Reference)', in *Traditional Crafts First Forum* (Port Said, 2020).

¹¹ Ramses. Wissa Wassef, Werner. Forman, and Denis. Mahaffey, 'Woven by Hand', 1972.

¹² RWWAC, *Threads of Life: A Journey in Creativity* (Cairo: Ramsess Wissa Wassef Art Center, 1998).



Figure 4. The surrounding setting RWWAC (By Author)



Figure 5. Historical photos shows the early stages of the tapestry workshop in 1950s (source: RWWAC Archive)





Figure 7. Ramses Wissa Wassef 's first tapestry



Figure 8. Weaving looms and traditional tools





Figure 9. Samples of the wool tapestries exhibited in the showroom the one on the right is a about the architecture of the workshop by one of the first generation artists

The center succeeded in reviving and developing the traditional weaving craft and transforming it into a unique art and traditional Egyptian mud-brick architecture.¹³

4. Values assessment process

The application of the proposed model in the workshop resulted in the construction of a provisional value–attribute matrix. Architectural analysis, literature, and expert interviews revealed many related values. Further studies were needed to reveal the contextual interaction. Moreover, local community interviews clarified the associations and connections between the locals and the site, and studies on a national level revealed the site's connections with Traditional mud architecture, the traditional weaving craft, the architectural influence of the site on other contemporary architects, and the developmental role of the experiment on surrounding villages. Table 2 presents a limited sample of the value-attribute matrix.

¹³ AKHDN, 'Ramsess Wisa Wassef Art Center Technical Review', 1983.

			Values								
	Aro	chitectural	Heritage	Historical values	Social values	Scientific values	Aesthetic values	Architectural values	Functional values	Economic values	Environmental values
		Form	Use of traditional architectural elements					\checkmark			
			Use of natural materials					\checkmark			\checkmark
			Association with the architect	\checkmark	V						
		Accoriations	ldeas about children's creativity	\checkmark		\checkmark					
	Site	Associations	Alignment with the nature					\checkmark	\checkmark	\checkmark	\checkmark
Attributes			Community development through crafts		V	V					
		Practices	Building's function as a school								
			Tourism activity								
			Crafts associated with the architecture			V	\checkmark	\checkmark		\checkmark	
	Setting	Associations	Environmental compatibility					\checkmark	\checkmark	\checkmark	\checkmark
	Objects	Form	First tapestry he made himself	\checkmark	V	V	\checkmark				
			Weaving tapestries without prior models		\checkmark					\checkmark	
		Associations	Tapestries' natural colors and materials			V	\checkmark			\checkmark	
		Associations	Developmental role of experience								
			Identity search		\checkmark	√					
	Context		Reviving the weaving craft			√		\checkmark			
		Practices	Traditional Architecture techniques							\checkmark	
			Traditional Weaving techniques								

<Table 2> Tapestry workshop provisional value-attribute matrix

4.1 Process Output

Given the limitation of this study, a sample may illustrate the established value statement.

The site's function holds various social and societal values, instilling a sense of individuality, identity, inventiveness, and pride in artists. Furthermore, it produces a close bond between the architect, his family, and the village residents. Moreover, the impact extended beyond the site's walls to affect the entire village of Haraneya, distinguishing it and creating a long-term effect that is expected to have broader future implications as the experiment grows.

Many technical, aesthetic, social, and economic values are also included in the tapestries, as they are the most attractive element of the place. Further, the site contains a different set of artwork regarding their creators, which embody many of their thoughts, memories, and orientations but, as a whole, express their unique history and evolution of their identity over time.

The site may be described as a unique architectural and cultural representation, bearing the symbols of the historical stage to which it belongs. It presented many ideas and philosophies from reality and the Egyptian environment, which can be described as revolutionary given its actual human, social, and even economic impact on the lives of related people."



Figure 10. A tapestry created in 1984 presenting Wissa Wassef Art School by Mohamed Mousa indicating the local artist's perception of the architecture and its surrounding setting

5. Conclusion

The study and its application revealed the importance and complexity of probing the local context of the architectural heritage, assessing values based on a comprehensive understanding of the cultural context. The study employed local literature and interviews with Egyptian experts to form the intellectual perspective of the assessment process and conducted interdisciplinary contextual studies that clarify the connection between the historical, social, and economic context and the assessed heritage, as per local community opinions that represent the local perspective of the site's significance. However, enlarging the base of participants in the process may yield further results. Accordingly, it is highly recommended for future research to adopt various tools to ensure wider data collection regarding stakeholders opinions. The application of the approach also revealed many vital results. First, the process is not linear; its steps are interrelated and circular. Second, the process's credibility is entirely based on the collected data, its comprehensive preciseness, and, of course, the variety of its sources. Third, careful consideration should be given to the dialectic issues related to the values, such as typology overlapping, which require the clarification of each value in the statement of significance.

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Interpretation Strategies of Industrial Heritage in the Museums of Egypt

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Abstract

The industrial heritage in Egypt is extremely significant for economic, social, and educational value. However, Egypt's museums have no clear cultural strategy for the efficient development, interpretation, and preservation of Egyptian industrial heritage. Industrial heritage comprises the remains of the industrial culture that have technological, historical, social, scientific, or architectural value. Museums face a challenge in interpreting such heritage by exhibiting, animating, and creating the context. There is an urgent need for museums to collect, record, preserve, interpret, and present the national industrial heritage. This study analyzes the international trends in museum interpretation of industrial heritage in Europe, focusing on the cases of England, and evaluates the current interpretation strategies of industrial heritage in the museums of Egypt, where the industrial revolution from the 18th to 19th centuries has a deep impact on the history of industry in Egypt. The study presents a clear strategy to produce the guidelines for interpreting the industrial heritage in the museums of Egypt through a formal policy document, which outlines the international trends and approaches to the interpretation of industrial heritage in museums and can be applied in the cases in Egypt. It presents an industrial heritage museum scenario in Egypt, highlighting the most effective international trends in interpreting industrial heritage, revealing the intangible practice, and noting the role of industrial heritage that gives evidence of activities with profound historical consequences.

1. Introduction

The industrial heritage in Egypt can offer economic, cultural, and social benefits to the community. However, the term "industrial heritage" is not defined in Egypt. It refers to the physical remains of the history of technology and industry, such as manufacturing and mining sites and power and transportation infrastructure. The term also covers places used for social activities related to the industry. The scientific study of industrial remains is called industrial archaeology. The Nizhny Tagil Charter for the industrial heritage was signed in Moscow in 2003 by the International Committee for the Conservation of the Industrial Heritage (TICCIH; pronounced "ticky"). The International Council on Monuments and Sites (ICOMOS) defines industrial heritage as "the remains of the industrial culture [that are] of social, historical, architectural, technological, or scientific value. These remains consist of machinery and buildings, mills, factories and workshops, sites and mines for processing and refining, stores and warehouses, places where energy is generated, used, and transmitted, transport and all its infrastructure, as well as places used for social activities related to the industry such as education or religious worship." The term has been a subject of interest since the beginning of the industrial revolution in the second half of the eighteenth century to date.¹

Industrial landscapes faced deep transformations that, in several cases, contributed to their dereliction, thereby inducing the disappearance of varied industrial values after the Second War.² Interpreting the value and significance of industrial heritage is connected with the values of culture and linked with people's lives.³

Good examples of interpreting industrial heritage are the industrial heritage worldwide where the context of discovery is the key to the interpretation process.⁴ Beyond aspects and methods used for interpreting industrial heritage, it is necessary to go back to the people involved. Visitors draw meaning from successful interpretation approaches, where the interpretation connects aspects of the experiences and understanding of the visitors. Interpretation of the industrial context could be straightforward, as situating the people in the industrial picture is among the major successful interpretation processes.

Official industrial heritage interpretation regards the development of the visitors' experience and the concept of historical value. This approach of interpretation displays the industrial objects in the industrial context to reveal the human aspect of the industry. Interpreting the industrial process can be identified by displaying the manual manufacturing process from the basic process of production to a finished product. It sheds light on the skill of the people in using the machine as an industrial device to reveal the intangible practice.⁵

Interpretation of industrial heritage can be applied through participation. Visitors are encouraged to participate in single manual tasks, such as hand-grinding grain, or spinning wool, to bring them into closer contact with the materials linked with the industrial devices (wood, stone, and grain). Such participation aims to engage visitors with the skill and value of an industry. In some cases, this interpretive approach is operated as a commercial transaction. Visitors must pay to participate.⁶ Moreover, one of the interpretation approaches of the industrial heritage is to interpret the product of industry without merely selling them.

Industrial heritage education at museums is another point of analysis. Education in museums is a

¹ TICCIH (Moscow: 2003), accessed August 2022, https://www.icomos.org/18thapril/2006/nizhny-tagil-charter-e.pdf, p. 1-4.

² Luis Loures, Industrial Heritage: The past in the future of the city (Instituto Politécnico de Portalegre: 2008), p.4.

³ Luis Loures, Industrial Heritage: The past in the future of the city, p. 5

⁴ Marion Blockley, Alison Hems, Heritage Interpretation (Routledge, London & New York: 2006), p. 120.

⁵ Marion Blockley, Alison Hems, Heritage Interpretation, p. 115

⁶ Marion Blockley, Alison Hems, Heritage Interpretation, p. 116

communication process to reveal the meaning and value of a collection. It addresses the characteristics and needs of the museum's existing and potential audiences. Regarding museums with industrial heritage collections, education activities are linked with the interpretation approaches.⁷ The education activity linked with the display is one of the interpretation approaches, where children are among the major museum visitor groups. The light system linked with the illustrated maps and the design of the display develop a framework for facilitating strategies and activities for children's learning in the museum. The use of replicas generates many stories and embodies considerable past human energy. This approach of concept recreation explores the concepts of value and authenticity and creates a learning environment about the role of the machine. The use of interactive touchscreen systems as an innovative information display enables several visitors at once to explore adequate information about the history of the machine and its mechanism. The quotes of people who used the industrial devices reveal the historical events linked with the device and identify the intangible aspects of such materialistic heritage. Among the key moments regarding the interpretation of industrial heritage is when the museum displays the historical moment linked with the industrial device. Workshop sessions for schools, where pupils are immersed in the sights, sounds, and smells of mill life as they witness original machinery at work are important engagement aspects.

2. Research Progress Highlights

2.1 The first part of the proposed strategy for interpreting the industrial

heritage in the museums of Egypt focuses on the following aspects:

- 1) The importance of recording, maintaining, and conserving the industrial heritage, as analyzed by TICCIH, an adviser to ICOMOS on industrial heritage.⁸ TICCIH is the world organization for industrial heritage. It promotes the preservation, conservation, investigation, documentation, research, and interpretation of the archaeology and cultural heritage of the industry.
- 2) The representation of industrial heritage on the UNESCO World Heritage List and Tentative List as presented by the UNESCO World Heritage Centre Asia-Pacific Region.⁹ The number of World Heritage Properties by region, defined by UNESCO each Year: 1978–2018 Cultural, Natural, and Mixed World Heritage Properties by region in 2020, including industrial ones.
- 3) The International Trends in Museum Interpretation of Industrial Heritage.¹⁰ The basic principles of interpretation as introduced by references.¹¹

⁷ Marion Blockley, Alison Hems, Heritage Interpretation, p. 116–118

⁸ ICOMOS was founded in 1965 in Warsaw because of the Venice Charter of 1964 and advises UNESCO on World Heritage Sites, accessed August 1, 2022, <u>https://www.icomos.org/en</u>.

⁹ UNESCO, The United Nations Educational, Scientific and Cultural Organization, accessed

^August 10, 2022, https://en.unesco.org/

¹⁰ Luis Loures, Industrial Heritage: The past in the future of the city (Instituto Politécnico de Portalegre: 2008), p. 4.

¹¹ Marion Blockley, Alison Hems, Heritage Interpretation (Routledge, London & New York: 2006), p. 120

- 4) Examples of the International Trends in Museum Interpretation of Industrial Heritage.
- 5) Analyze the history of the industrial heritage in Egypt and the current situation in interpreting the industrial heritage in Egypt's Museums.
- 6) Analyze the level of awareness of the meaning and the value of the industrial heritage interpretation in Egypt Museums by organizing a webinar on Museums and the Industrial Heritage in Egypt directed to the key stakeholders.

2.2 The second part focuses on the industrial heritage engagement in Egypt's museums and writing guidelines that offer an approach to address its interpretation. The guidelines aim to

- Highlight the definition of industrial heritage in the programs of the museums, as "Industrial heritage consists of the remains of industrial culture [that] are of historical, technological, social, architectural, or scientific value. These remains consist of buildings and machinery, workshops, mills and factories, mines and sites for processing and refining, warehouses and stores, places where energy is generated, transmitted, and used, transport and all its infrastructure, as well as places used for social activities related to the industry such as housing, religious worship, or education." (The Nizhny Tagil Charter, ICOMOS, 2003)
- Highlight the role of industrial heritage that serves as evidence of activities that have had and continue to have profound historical consequences in the Education programs of museums by encouraging employees to engage with visitors.
- Get visitors to follow and engage with Egypt Museums on social media and social platforms
- Invite guest speakers to speak about the value of the industrial heritage (specialists from Egypt and abroad)
- Create educational experiences by providing access to collections and fostering a range of interpretations using them as a medium for learning.
- Develop innovative models of engagement that represent the cultural context of the Egyptian community
- Create a range of positive, stimulating experiences for audiences throughout their visit to highlight the industrial heritage on display.
- Consider diverse audiences in the engagement process and understand the different interests, backgrounds, and values of the audience.
- Consider the nature of industrial heritage on display in the education environment.

2.3 Analyze the interpretation and education approaches highlighting four cases (two each from Egypt and England) to define the Industrial Heritage interpretation, education, and engagement approaches, where the machines on display at the two cases museums are British-made

Example 1 England London Transport Museum Example 2 Egyptian Railway Museum in Cairo Comment

The two museums provide an informative record of the history of transportation in Egypt and England. The interpretation techniques are dissimilar in both museums, depending on space, collection, and marketing platforms. The Egyptian Railways Museum has no identification signs inside its location or effective marketing platforms; however, the London Transport Museum is ideal in such aspects. Most of the Egyptian Railways Museum's visitors are primary students of social studies in transportation, students of the Faculty of Engineering of the Railway Institute, and students of the railway school who enjoy a detailed explanation of train models. The London Transport Museum is among the most attractive museums in England, visited by many. It employs advanced interpretation methods such as interactive screens and educational activities in the main display. The Egyptian Railways Museum employs classical methods of interpretation. The London Transport Museum has many facilities and activities for visitors, such as a gift shop, cafeteria, theater, and programs for families; however, the Egyptian Railways Museum has no gift shop or cafeteria, and there are no fixed educational programs according to a clear schedule and policy. It is the only museum in Egypt on the history of railways and transportation.

Example 3 England Helmshore Mills Textile Museum Example 4 Egypt Cotton Museum

Comment

The two museums present an informative record of the history of the manufacture of textiles and cotton, elaborating on the value of the industry in Egypt and England. The Cotton Museum includes displays of many fine and distinctive textile products as one of the interpretation approaches to display textile machines and their products. Helmshore Mills Textile Museum uses replicas of the people involved in the industry works and activity. There is a replica of Sir Richard Arkwright, an English inventor and a leading entrepreneur during the early industrial revolution, in the context of displaying an industrial object.¹² Replicas can be very useful as a teaching tool when the original artifact is not readily available or is too fragile for handling and exhibiting. The Cotton Museum in Cairo is a specialized museum in the cotton industry. However, the textile museums of England interpret the manufacturing of textile wool,

¹² The official website of the Lancashire County Council, accessed December 5, 2022 <u>https://www.lancashire.gov.uk/leisure-and-culture/museums/</u>

linen, and cotton. The interpretation approaches of the industrial devices differ, considering the collection and the space of the display. The textile museums of England consider the buildings, landscapes, and subculture related to the industrial period. They set the platform with local, industrial, cultural, and regional identities. The objects of display shed light on the context of the industrial heritage society in England. The Egyptian Cotton Museum Presents a unique example of handling the industrial and physical remains alongside the archival photos of the manufacturing process. The Egyptian Cotton Museum has been closed because the development work requires special procedures, especially given that the development includes old buildings. The engineering supervision of the development process is assigned to the Central Department of Engineering Affairs, a committee at the highest level headed by Dr. Sherif Murad, Dean of the Faculty of Engineering, Cairo University, and several professors of engineering at the American University, Cairo, and Ain Shams Universities. The restoration is conducted periodically for all the objects. When an archaeological object is changed, beyond the cooperation of the Faculty of Archeology, Cairo University, the members of the Ministry of Antiquities are notified in the restoration process.

In summary, every case in Egypt or England has its unique identity in using interpretation methods from the perspective of the authority that manages the museums based on their scientific concepts and practices. The similarities in the approaches in Egypt and England are in the types of the collection not in the interpretation methods. Both use dynamic interpretive techniques considering resources, audience, site characteristics, themes, and objectives from the perspective of the authority that manages these museums. Both cases have different learning strategies that suit the nature of the community and the type of visitors in both countries. Both selected contents carefully to create an engaging, cost-effective, and powerful story that gets results.

3. A formal policy document that outlines the international trends and approaches to the interpretation of industrial heritage in museums and can be applied in the cases in Egypt

The formal policy document highlights the skill of the people in using the machine as an industrial device to reveal the intangible practice. The document presents a frame of education programs to create a range of positive, stimulating experiences for audiences throughout their visit, considering the nature of industrial heritage on display in the education environment.

- A formal policy document includes:
- 3.1 Document header
- 3.2 Introduction/Purpose Statement
- 3.3 Policy statement:
- 3.4 Definitions

- 3.5 Procedures
- 3.6 Reporting requirements
- 3.7 Prioritize a policy timeline
- A formal policy document details

3.1 Document Header

The document header states the title of the policy: "the effective interpretation strategies of industrial heritage in the museums of Egypt." It also defines the key stakeholders that might be involved in applying the policy document (listed in the following table), which shows the role of the key Stakeholder in Egypt in the policy document

Name of the stakeholder	How important is interpretation strategy (Low- Middle – High)	What the industrial heritage on display in Egypt Museums need from the stakeholder
The Egyptian Ministry of Trade and Industry Governmental	High	Provide technical preservation for the industrial heritage on display at the museums of Egypt
The Ministry of Culture of Egypt Governmental	High	Highlight the intangible aspects of the industrial heritage in the interpretation process
The Egyptian Ministry of Tourism and Antiquities Governmental	High	Provide technical conservation to the organic materials linked to the machines on display through the conservation department at the Ministry and set a marketing campaign highlighting this kind of heritage to raise awareness of its importance
Arab Organization for Industrialization Governmental	High	The Arab Organization for Industrialization is an Egypt-based Arab military organization established in 1975 by Egypt, Saudi Arabia, the United Arab Emirates, and Qatar to supervise the collective development of the Arab defense industry The organization could provide bilateral cooperation between Egypt and other Arab countries in the protection and preservation of industrial heritage in museums
Egyptian National Railways Authority Governmental	High	Provide technical support in interpreting the collection of the Egypt transportation history
The Arab Constructors Al Mokawloon Al Arab Non-Governmental	High	The Arab Contractors is one of the leading construction companies in the Middle East and Africa The company can provide financial assistance to the museums of Egypt that display construction machines
Misr Spinning and Weaving Mahala Company Non- Governmental	High	The company can provide financial assistance to the museums of Egypt that display the textile machines

Name of the stakeholder	How important is interpretation strategy (Low- Middle – High)	What the industrial heritage on display in Egypt Museums need from the stakeholder
The Metal Industry Company Non- Governmental	High	The company can provide financial assistance to the museums of Egypt that display the Metal Industry
The Ministry of Higher Education and Scientific research (Faculties of engineering) Governmental	High	Provide publications— training for specialists—practical training for students of universities
Bibliotheca Alexandrina Governmental	Middle	Provide publications—training for specialists
The International Committee for the Conservation of the Industrial Heritage, TICCIH International	High	Provide international experience in documenting and interpreting the industrial heritage in museums
International Council of Museums ICOM International	High	Provide a communication platform for museum- and heritage- related projects, experiences, and discussions about the sector

The document header states the list of industrial heritage in Egypt Museums, the operating organization, or museums in the following table.

Industrial heritage	Name of museum	The location in Egypt	The authority
Historical printing presses machines and their accessories	The Bibliotheca Alexandrina Art Exhibitions & Collections Department	Alexandria	Issued by Presidential Decree No. 76 for the Year 2001 <u>https://www.bibalex.org/en/Page/</u> <u>Presidential_Decree</u>
Historical vehicles of the Heliopolis tram	Baron Palace Garden	Cairo	Egyptian Ministry of Tourism and Antiquities
Historical Royal chariots of different styles	Royal Carriages Museum	Cairo	Egyptian Ministry of Tourism and Antiquities
Historical typewriter - an old fan, an Iron and antique radio, a gramophone device, and an old electric fireplace	The house of Haward Carter	Luxor South of Egypt Cairo	Egyptian Ministry of Tourism and Antiquities
Old machines from the Egyptian security services as well as tools used in police departments	The National Police Museum	Cairo	Egyptian Ministry of Tourism and Antiquities

Industrial heritage	Name of museum	The location in Egypt	The authority
Old cameras used during the 18th and 19th centuries in Egypt Nation		Cairo	The Egyptian Ministry of Information
Old cameras used during the 18th and 19th centuries in Egypt in media and movie production	The Cinema Place Museum	Cairo	The Egyptian Ministry of Information
The first storage medium (solid disk) used as the first bank in the Middle East in the various operation	Talaat Harb Pasha Museum Bank of Egypt	Cairo	The Ministry of Finance of Egypt
Historical machines in various Departments Department of Local Networks 2- Department of Telephone Number 3- Division for Ground Cable Malfunctions, 4- Department of Switches 5- PABX Department 6- Correspondence Section 7- Optical Section 8- Information Transfer Section 9- Department of Projectors and Microfilm	The Communication Museum	Cairo	Telecom Egypt Egypt's primary telephone company It started in 1854 with the first telegraph line in Egypt. In 1998, it replaced the former Arab Republic of Egypt National Telecommunication Organization
Historical Aircrafts First Egypt-made plane (Cairo 300)	The Egyptian Air Forces Museum	Cairo	The Egyptian Air Force authority Egyptian Ministry of Defense
Historical trains and old transportation systems in Egypt	The Egyptian Railway Museum	Cairo	Egyptian Ministry of Transportation
Old textile machines	The Cotton Museum	Cairo	The Egyptian Ministry of Agriculture
Old irrigation devices	The irrigation Museum	Qalyubia Governorate One of the governorates of Egypt. Located in Lower Egypt	Egyptian Ministry of Irrigation and Water Resources

3.2 Introduction/Purpose Statement

This part of the policy defines what it is about and the reason for having it

3.2.1 The importance of the policy and why it is needed

The industrial heritage in Egypt is extremely significant for economic, social, and educational value. However, such heritage is not sufficiently acknowledged by Egyptian museums or communities. The products of the industrial heritage tools are incomplete and poorly documented in the museums. The values and potentials of the industrial heritage in Egypt are also not recognized as a part of the Egyptian cultural identity. No cultural strategy in the museums can enable efficient development, interpretation, and preservation of the Egyptian industrial heritage. The collection of industrial heritage tools and methods that transfer specific products is incomplete and poorly documented. Moreover, there is an urgent need for museums in Egypt to follow a policy document that collects, records, preserves, interprets, and presents the national industrial heritage.

3.2.2 The current situation of the industrial heritage in the Arab region based on the UNESCO World Heritage Centre

The industrial heritage analysis conducted by the UNESCO World Heritage Centre of the Asia-Pacific Region in 1999 notes that the category industrial heritage is an underrepresented category of cultural, natural, and mixed sites. In the 2012 analysis, 52 of the 936 UNESCO World Heritage areas are industrial properties.¹³ Tentative Industrial Heritage embraces 8.2% of all Tentative Cultural sites and 6.2% of all Tentative World Heritage Sites. Only three industrial heritage sites with very special topics are listed as mixed sites on the Tentative List in the Arab region. The three mixed sites are

- 1. "Bulk Products Industries" with a commercial center for the metallurgical industry of gold, iron, and copper in Mauritania
- 2. "Power sources and prime movers," there is an exceptional water wheel system in Hama, Syria.
- 3. "Specialized structures and objects are shown at Aflaj,"¹⁴ a ground and subterranean canal system in Oman.¹⁵ As associated with industrial value sites, there are, for example, several aqueducts in Jordan and Lebanon and a lighthouse in Egypt.

3.2.3 The history of the industrial heritage in Egypt

Egypt has witnessed an industrial renaissance in the 19th century by "Muhammad Ali" whose era is known for the establishment of a major industrial base, including the textiles and sugar industry, production of oils, rice mills, and military industries. The sugar industry started in 1835; the textile industry, 1911; and phosphate fertilizers, 1937. Moreover, the iron industry started in 1948, and nitrogenous fertilizers, 1951. These initiatives were based on the efforts of the private sector, such as Banque Misr,

¹³ Michael Falser, Industrial Heritage Analysis (Austria: 2001), accessed August 1, 2022, <u>https://whc.unesco.org/archive/ind-study01.pdf</u>

¹⁴ The Aflaj Irrigation Systems of Oman are ancient water channels from 500 AD located in the regions of Dakhiliyah.

¹⁵ Michael Falser, Industrial Heritage Analysis, p. 20



Figure 1. one of the Industrial Fairs during the sixties in Egypt Source: The Egyptian President Gamal Abdel Nasser official website, accessed December 3, 2022, <u>http://nasser.bibalex.org/home/main.aspx?lang=ar</u>

established in 1920.16

It would seem that there is considerable evidence of several industries during the sixties in Egypt where machines were Egyptian-made, such as the textile factory in Damietta, the tire and rubber factory in Alexandria, and the factories of the city of medicine in Abu Zaabal. The military industry was among the major industrial efforts during the sixties in Egypt. Egypt, along with India and former Yugoslavia, initiated an ambitious project to manufacture planes, missiles, jet engines, and weapons. The Helwan HA-300 plane was manufactured in Helwan from 1964–1969. Al Nasr Auto Factory was among the major factories dating back to 1958; it was located in the Wadi Hof area, next to a primary source of raw material in the Tebeen iron and steel factory. The Egyptian Iron and Steel Company was the first integrated project that elaborated on Egypt's iron industry, which depends on iron ore; the construction of the company started in 1956. Figure 1 shows one of the Industrial Fairs during the sixties in Egypt.

3.3 Policy Statement:

The statement is directed to the key stakeholders and the ones in charge of implementing the policy.

The keywords in interpreting industrial heritage are audience and participation, where the aspects of the policy focus on

- 3.3.1. Presenting the interpretation of the industrial process that can be identified by displaying the manual manufacturing process starting from the basic function of production to a finished product, thus highlighting the skill of the people in using machines as industrial devices to reveal the intangible practice
- 3.3.2 highlighting the interpretation of industrial heritage that can be applied through participation,

¹⁶ Shura Council, Fifth Ordinary Session, Report of the Production and Manpower Committee on Industrial Policy in Egypt (Government Media office Egypt: 1985), p. 5–4.

where visitors are encouraged to participate in single manual tasks

- 3.3.3 highlighting a straight-forwarded interpretation process of the industrial heritage, thus putting the people in the industrial picture.
- 3.3.4 Highlighting the interpretation of the industrial heritage at the industrial heritage sites where the context of discovery is the key to the interpretation process.

The policy statement provides a comprehensive assessment of the major tendencies in the legal protection of industrial heritage in Egypt

In Egypt, the Ministry of Trade and Industry is in charge of the industrial bodies. It focuses on the current and new industries in Egypt as the engine of sustainable and inclusive economic development. Its mission does not list any efforts, projects, or even initiatives concerning the protection of the industrial heritage in Egypt. It, instead, focuses on multiplying exports and supporting small and medium industries, developing the industrial zones system, building environmentally friendly industrial cities, reconciling current industrial cities, and transforming them to serve the green industry, green economy, and sustainable development.¹⁷

The Department of the International Cultural Heritage Organizations and International Cooperation at the Egyptian Ministry of Tourism and Antiquities and the Heritage Management Unit at the Egyptian Ministry of Culture are the two governmental ministries that document the identity of heritage properties in Egypt. Moreover, a committee was established by the Egyptian Prime Minister to manage the documentation of the heritage areas in Egypt in 2018, including members of the Ministry of Tourism and Antiquities, Environment, and Interior. Notably, the Egyptian industrial heritage is not listed in the list of World Heritage Sites in Egypt; the UNESCO list for Egyptian heritage sites does not mention the industrial type. Egypt's museums display the industrial heritage collection as objects of history, not industry. They do not follow a clear policy for interpreting the industrial heritage based on its nature and value.

The policy statement highlights the conservation of industrial heritage. The technique of conservation used can pave the way to engage the visitors of the museums with the richness of industrial objects. Seeing industrial heritage collection in a movement can reveal the design and manufacturing skills, thereby helping to re-learn the technologies behind the industrial objects.¹⁸ The basic policies and procedures for the preservation and protection of = museum collections are among the ethical responsibilities of the museum. Conserving the industrial collection means addressing some practical and ethical issues. There are many challenges in the process of the conservation of industrial artifacts, where technical objects have a practical function with characteristics that make them different. The industrial collection in the museums is representative of productive activity in a particular place. The conservation of the industrial collection identifies the physical condition of the object and its core value. Procedures for

¹⁷ The Egyptian Ministry of Trade and Industry -main mission, accessed: December 7, 2022 <u>http://www.mti.gov.eg/English/Pages/default.aspx</u>

¹⁸ David Gauntlett, Making is connecting. The Social Meaning of creativity, from DIY and knitting to YouTube and Web 2.0 (Cambridge: Polity, 2011), p. 100–150.

preservation establish the significance and importance of each industrial object.

The policy defines the conservation guidelines of industrial heritage in museums of Egypt that might follow the following template

Conservation needs	Assessing industrial collection materials and condition	Defining highly complex and composite objects	Recording collections with various substances: metals, wood, textiles, lacquers, rubbers, and plastics	Analyzing the challenges in making working industrial objects accessible
Priorities	Conserving the mechanism of industrial objects and the way they function	Defining the ways to operate industrial objects to bring them back to life	Finding ways to engage visitors with these objects	Finding ways to increase the revenue

3.4 Definitions

It is important to define terms linked to the policy for easy comprehension.

Industrial heritage: "The remains of the industrial culture [that are] of social, historical, architectural, technological, or scientific value, These remains consist of machinery and buildings, mills, factories and workshops, sites and mines for processing and refining, stores and warehouses, places where energy is generated, used and transmitted, transport and all its infrastructure, as well as places used for social activities related to the industry such as education or religious worship."¹⁹

TICCIH	The Nizhny Tagil Charter; ICOMOS' adviser on Industrial Heritage, signed in Moscow in 2003
	by TICCIH and ICOMOS
ICOMOS	International Council on Monuments and Sites
UNESCO	The United Nations Educational, Scientific, and Cultural Organization
CIMUSET	The International Committee for Museums of Science and Technology
ICOM	The International Council of Museums

Interpretation in the context of the museum means explaining an object and its significance; it also means translating from one language to another. Museums should adapt their strategies and several techniques for different targeted audiences as different people visit the museum for different purposes.²⁰

"Interpreting our Heritage" defined six principles of interpretation: 1. Any interpretation that does not present a unique experience to the visitors or misses the link with what is being displayed or described will be sterile.2. Information is not interpretation. Interpretation is a revelation based on the information. However, all interpretation approaches include information. 3. Interpretation is an art combining many arts, whether the materials presented are historical, architectural, or scientific. Any art is teachable to some

¹⁹ TICCIH, The Nizhny Tagil Charter for the Industrial Heritage, p. 1–4.

²⁰ Timothy Ambrose and Crispin Paine, Museum Basics (London; New York: Routledge, 2006), p. 200–250.

degree. 4. The main aim of interpretation is provocative, not instructive. 5. Interpretation should present a whole rather than a partial topic. 6. Interpretation addressed to children should not be as that presented to adults; it should follow a different approach to be a different program.²¹

Heritage education is an approach to teaching and learning about culture and history that uses information available from human and material culture and built environments as primary instructional resources.²²

3.5 Procedures

Step-by-step instructions for routine tasks and operations

- 3.5.1 The policy is to be implemented by the Egyptian Ministry of Trade and Industry, which is in charge of industrial bodies. It can be the key stakeholder operating the policy procedures. Beyond Egypt's industrial production, active units are the Egyptian Ministry of Military Production and the Arab organization of industrialization. The following table details the factories reflecting the industrialization strategy in Egypt, which witnessed the launch of a huge iron and steel plant alongside car assembly lines and a military aircraft factory.²³
- 3.5.2 Phases of the policy
 - Understand the significance and value of the industrial heritage in Egypt
 - Document the Egyptian Industrial heritage
 - Write the industrial heritage interpretation guidelines that the museums of Egypt should follow
 - Design a scenario of the Industrial Heritage Museum in Egypt to highlight the interpretation strategy guidelines

1- Understand the significance and value of the industrial heritage in Egypt

In the current context of the Egyptian industrial heritage, it is apparent that the need to define, set, and apply conservation, education, and interpretation procedures that strengthen the three noted scopes can safeguard the value of the industrial history of Egypt. All current Egyptian conservation laws must use specific terms to define and protect the technical objects and industrial buildings in Egypt.

The Egyptian Ministry of Trade and Industry, along with the key stakeholders listed in the document header, aims to set up a searchable database developed by a group of Industrial History Societies in Egypt and provide an online repository for members' knowledge, photographic research notes, audio, and sound recording of industrial sites, artifacts, and processes.

The design of the searchable database serves as a cyber database that aims to collect data and classification of data linked to the industrial heritage of Egypt.

A sample of a database, such as the one developed by a group of Industrial History Societies in England, can provide an online repository for sound recording of industrial sites, artifacts, and processes.²⁴ This

²¹ Freeman Tilden, Interpreting Our Heritage (Chapel Hill: University of North Carolina Press, 1977), p. 3–11

²² Kathleen Hunter, Heritage Education in the Social Studies, ERIC digests Clearinghouse for Social Studies/Social Science Education (Indiana University: Washington, D.C. 1988), p. 3, 6.

²³ Egypt industry production active unites, accessed December 6, 2022, <u>https://carnegie-mec.org/2019/11/18/mapping-formal-military-economy-part-1-citadel-of-egyptian-industry-pub-80334</u>

²⁴ Database Entries and Images Copyright Yorkshire Archaeological and Historical Society and the Individual Contributors (England: 2022) accessed December 6, 20220, <u>https://www.industrialhistoryonline.co.uk/yiho/.</u>



Source: Egypt industry production active unites, accessed December 6, 2022, <u>https://carnegie-mec.org/2019/11/18/mapping-formal-military-economy-part-1-citadel-of-egyptian-industry-pub-80334</u>

database currently contains 10435 records and 4579. (Figure 1)

2-Document the Egyptian Industrial heritage

Form a national committee to represent the managing policy of the Egyptian industrial heritage regarding the guidelines of TICCIH and a world organization for industrial heritage.²⁵ This national committee should be

²⁵ The International Committee for the Conservation of the Industrial Heritage accessed December 6, 2022, <u>https://ticcih.org/about/</u>.

Figure 1.



under the supervision of the Egyptian Ministry of Trade and Industry. Its task is to set an initiative to document Egyptian national heritage and contribute to writing an Egyptian conservation law using specific terms to define and protect the industrial objects and buildings in Egypt. The law must support the prioritization of protecting Egyptian industrial heritage regarding social and political discourse.

This national committee could follow the policy of the association for the preservation of industrial heritage under the authority of Prince Badr bin Abdullah bin Farhan, the Saudi Minister of Culture, as Saudi Arabia is the first country to set an association for the preservation of industrial heritage in the Middle East in 2019. The association aims to shed light on the industrial heritage in the Arab region and raise community awareness of the value of cultural industry landmarks. The Saudi Minister of Culture noted the plan of this association, including workshops and awareness campaigns in cooperation with industrial bodies in the Arab region. The policy of association is focused on maintaining and documenting industrial landmarks, along with international universities. The first meeting for this massive project was held on Sunday, July 14, 2019. Prince Badr bin Abdullah bin Farhan stated that the first step is to establish the first national database for all industrial sites in Saudi Arabia and the Arab region. He also announced a competition for the industrial bodies, where participants must send pictures, videos, and basic information about the cultural industry landmarks in Saudi Arabia; they would then tell stories and perform detailed events on the industry and social life through voice recording or videos.²⁶ The official spokesman of the Saudi Ministry of Culture, Abdul Karim Al-Hamid, noted that the industrial heritage competition received various contributions from members of society, more than 800 posts, where the participants' listed industrial heritage sites in various regions of the Kingdom varied between factories, stations, and historical

²⁶ Ministry of Culture Saudi Arabia, the Preservation of Industrial Heritage, accessed December 6, 2022, <u>https://www.moc.gov.sa/en/About.</u>



Figure 2. The announcement of the Saudi Ministry of Culture competition for documenting the industrial heritage in Saudi Arabia

Source: The official website of Ministry of Culture Saudi Arabia, accessed: December 7, 2022, https://www.moc.gov.sa/en/About 3- Define the industrial heritage interpretation guidelines, followed by that of the museums of Egypt

buildings related to the industry. The Ministry has identified three tracks to participate in the competition to document the heritage patterns that have contributed to the industrial development in the Kingdom, such as buildings, factories, and machines. The first track is "The Discovery Challenge" and includes the discovery of industrial heritage sites, documented through pictures or videos. The second track is "challenge the story," which includes recordings of the stories of the industrial heritage sites. The third track is "The challenge of documentation." The interest of the Saudi Ministry of Culture in supporting and documenting industrial heritage stem from the belief in the symbolic value of the history of industrial establishments that contributed to economic development in the Kingdom and its reflection on social growth and the strengthening of the national identity.²⁷ The initiative of the Saudi Ministry of Culture aims to motivate all categories of society to highlight the industrial history in the Kingdom by discovering industrial landmarks and documenting its material and social history, paving the way to list several Saudi sites of industrial heritage on the World Heritage List (see Figure 2)

3- Define the industrial heritage interpretation guidelines, followed by that of the museums of Egypt

- 3.1 Good examples of interpreting the industrial heritage are the industrial heritage sites beyond Egypt, where the context of discovery is the key to the interpretation process.
- 3.2 Beyond aspects and methods used for interpreting industrial heritage, it is necessary to go back to the people involved.²⁸
- 3.3 Visitors draw meaning from successful interpretation approaches, where the interpretation connects aspects of the experiences and understanding of the visitors
- 3.4 Situating the people in the industrial picture is among the major successful interpretation processes.²⁹

²⁷ Ministry of Culture Saudi Arabia, the Preservation of Industrial Heritage, accessed December 7, 2022, <u>https://www.moc.gov.sa/en/About.</u>

²⁸ Marion Blockley, Alison Hems, Heritage Interpretation, p. 117

²⁹ Marion Blockley, Alison Hems, Heritage Interpretation, p. 117

- 3.5 Organizations in charge of interpreting Industrial Heritage can be corporate entities with policies. Such organizations can use official interpretation and community-led interpretation.
- 3.5.1 Official industrial heritage interpretation regards the development of the visitors' experience and the concept of historical value. This approach of interpretation displays the industrial objects in the industrial context to reveal the human aspect of the industry. Interpreting the industrial process can be identified by displaying the manual manufacturing process from the basic process of production to a finished product. It sheds light on the skill of the people in using the machine as an industrial device to reveal the intangible practice.³⁰
- 3.5.2 Interpretation of industrial heritage can be applied through participation. Visitors are encouraged to participate in single manual tasks, such as hand-grinding grain, or spinning wool, to bring them into closer contact with the materials linked with the industrial devices (wood, stone, and grain). Such participation aims to engage visitors with the skill and value of an industry. In some cases, this interpretive approach is operated as a commercial transaction. Visitors must pay to participate.³¹
- 3.5.3 Community-led interpretation presents experience with participatory practices and local community engagement for the preservation and interpretation of the industrial heritage in Egypt
- 3.5.4 The interpretation of vivid stories and people's life experiences that aim to be inspirational to enhance people's lives and deliver true benefits, thus enabling visitors to understand the core value of Egypt's industrial heritage.
- 3.5.5 The interpretation must resonate with people's lives where learning is a life-long activity; therefore, layering interpretation to suit different needs is key.³²
- 3.6 Highlight the interpretative value, the knowledge and experience visitors gain from the visit to the museum. Regarding the associative value of heritage, it is explained by the operational guidelines for the implementation of the World Heritage Convention.³³

Define the industrial heritage engagement guidelines, followed by that of the museums of Egypt

- Highlight the definition of industrial heritage in the Education programs of the museums.
- Get visitors to follow and engage with Egypt Museums with industrial heritage on Social Media and communication platforms.
- Invite guest speakers to speak about the value of the industrial heritage (specialists from Egypt and abroad) in special events at the museums.

³⁰ Marion Blockley, Alison Hems, Heritage Interpretation, p. 115

³¹ Marion Blockley, Alison Hems, Heritage Interpretation, p. 116

³² Marion Blockley, Alison Hems, Heritage Interpretation, p.102

³³ The Operational Guidelines are periodically revised to reflect the decisions of the World Heritage Committee, UNESCO World Heritage Centre, accessed December 2022, 4, <u>https://whc.unesco.org/archive/opguide13-en.pdf</u>.

- Develop innovative models of engagement that represent the cultural context of the Egyptian community.
- Consider diverse audiences in the engagement process and understand the different interests, backgrounds, and values of the audience.
- Consider the nature of industrial heritage on display in the education environment.

The policy defining the engagement of industrial heritage in museums of Egypt may follow the following template

Aims and objectives of the Education programs	Define the learning objectives (the knowledge and skills you want the participant to acquire by the end of the program)
Challenges	Evaluate the Education programs
Useful tips and hints	Plan the Content and Schedule of the certain program
Target audience	Age, range of interests, and level of knowledge
Funded or not	
Type of the program	Select a teaching strategy to support learning goals, determine an effective teaching strategy, think about what you want participants to do or understand when they finish the workshops

Design a scenario of the Industrial Heritage Museum in Egypt to highlight the interpretation guidelines

- The Place of the Museum: Helwan University Helwan, Cairo Governorat
- The Type of the Museum: University Museum
- The Key Stakeholders

The Center for Documentation of Cultural and Natural Heritage, CULTNAT	https://www.cultnat.org/
Ministry of Tourism and Antiquities	https://egymonuments.gov.eg/
The Ministry of Trade and Industry	http://www.mti.gov.eg/English/Pages/default.aspx
Ministry of Defense and Military Production	https://www.mod.gov.eg/ModWebSite/Default.aspx
Bibliotheca Alexandrina	https://www.bibalex.org/ar/
International Committee for University Museums and Collections	http://umac.icom.museum/about-umac/
The Ministry of Higher Education and Scientific Research	http://portal.mohesr.gov.eg/en-us/Pages/default.aspx
Helwan University Heritage Training and Education Center "Cult-HeEd" - Helwan University	http://www.helwan.edu.eg/ Cult-HeEd@hq.helwan.edu.eg.

The Mission of the Museum is to highlight the Egyptian industrial heritage in Egypt, focusing on Helwan as one of the main industrial cities, to inspire the young generation with the value of the industrial heritage as an aspect of the cultural heritage and engage the Egyptian community in safeguarding this kind of heritage. The Objects of the Museum (Industrial, authentic, and movable objects that present irrefutable evidence of Helwan factories, manuscripts, books, photos, and archival documents)

The Scenario of Industrial Heritage Museum in Egypt (Talking Museum)

The project scenario exploits holographic projections to make objects of a museum exhibition "talk" during a user's visit to tell the story of the industrial devices in Egypt, focusing on the major industrial city of Helwan.³⁴ Figure 3 shows a case study with the related implementation details where holographic projections were used as an interactive technique of the display.

The key artifact of the museum is the Helwan (HA-300), developed in Factory No. 36 in Helwan. This factory is located in southeast Cairo under the supervision of the Egyptian General Aero Organization, officially established in 1959. There are some versions of this aircraft in Egypt; one is on display in the Egyptian Air Forces Museum. The second version is in the Military Production Factories in Helwan under the authority of the Egyptian Ministry of Military Production. Another version of the same aircraft is on display in Germany in the Flugwerft Schleissheim Museum.³⁵ Figure 4 shows archival documentation of Helwan HA-300 and the military factories during the sixties period in Egypt.

The key narrator of the museum, Mr. Aziz Sidqi, the first Egyptian Minister of Industry in 1956, appears at the entrance of the museum in an interactive visual model via the holographic projections technique. He talks about the ambitious Helwan HA-300 project in 1960 in Egypt, which is presented in a holographic projection at the center of the gallery. Mr. Aziz Sidqi will then present the history of industrialization in Egypt. Figure 5 shows Mr. Aziz Sidqi, an Egyptian politician and engineer, serving as the Prime Minister of Egypt from January 16, 1972, until March 26 . Aziz Sidqi, an Egyptian politician and engineer, served as the Prime Minister of Egypt from January 16, 1972, until March 26, 1973. In 1956, Sedky was appointed as minister of industry by President Gamal Abdel Nasser Among Sedky's tasks as minister was the supervision of an industrialization program.

The Themes of the Collections of the Industrial Heritage Museum (Talking Museum) The history of Egyptian Military (Industry) The history of Egypt Textile Industry The history of Egypt Auto Industry The history of Egypt Heavy Ammunition Industry The history of Egypt Tire and Rubber Industry The history of Egypt Medicine Industry

Egyptian Military (Industry)

The Egyptian Military industry theme aims to display archival photos of the history of military industry

³⁴ Holographic projection technology is used to create the illusion of life-size, full-color, and 3D moving images via digital video projection.

³⁵ David Edgerton, the Shock of the Old: Technology and Global History since 1900 (Madison Avenue, New York: Oxford University Press, 2011), p. 83-5.

in Egypt supported by military industrial devices to be selected from the Egyptian Military factories in Helwan in cooperation with the Egyptian Ministry of Defense and Military Production (Helwan Company



Figure 3. a case study with the related implementation details Holographic Projections photo of the Michelangelo museum, accessed December 7, 2022, <u>http://www.accademia.org/</u> Photo of the Science museum London, accessed December 7, 2022, https://www.sciencemuseum.org.uk/



Figure 4. an archival documentation of Helwan HA-300 and the military factories during the sixties period in Egypt

Source: President Gamal Abdel Nasser website, (accessed December 7, 2022) <u>http://nasser.bibalex.org/home/main.aspx?lang=ar</u>



Figure 5. Mr. Aziz Sidqi Source: President Sadat website, December 7, 2022, https://www.bibalex.org/en/Project/Details?DocumentID=232&Keywords

for Engineering Industries, Military Factory).³⁶ The General Administration of Military Factories was established in 1949 to establish military factories that produce Egyptian weapons for army use; in 1951, the first group of military factories was opened in Helwan, specializing in the manufacture of missiles, rifles, and projectiles of all kinds. On October 24, 1954, President Gamal Abdel Nasser inaugurated the largest factory of its kind in the Middle East for the production of small arms ammunition in Helwan.³⁷ Beyond war products, the production included cookers, pesticide sprayers, textile machines, diesel machines, medical substances (e.g., glycerin and ether), and machinery for making bottle caps, medicine bottles, and carbonated water.

Egypt Auto Industry

The Egypt Auto industry theme presents the history of Nasr Automobile Company, founded in 1960 in Egypt.³⁸ Date of establishment: Republican Decree No. 913 on 23/5/1960. Legal form: A subsidiary of the Holding Company for Metal Industries under Law 203 of 1991 concerning public business sector companies. Address: Wadi Hof - Helwan - Cairo - Tel: 23691901. Fax: 23692612-Email: <u>nasr.automotive@</u> <u>yahoo.com</u>.³⁹ The display aims to present archival photos reflecting the industrial devices produced by the company. Figures 6–7 show an example of archival photos of the Nasr Auto factory and its media announcement during the '60s in Egypt.

³⁶ Helwan Company for Engineering Industries, Military <u>https://fact99.momp.gov.eg/</u>.

³⁷ The history of Military Factory accessed December 7, 2022, <u>https://fact99.momp.gov.eg/</u>.

³⁸ The Holding Company for Metal Industries (Nasr Automobile company), accessed December 5, 2022, <u>http://www.micor.com.eg/</u> <u>Default_ar.aspx?ID=8412</u>

³⁹ (Nasr Automobile company), accessed December 5, 2022, <u>http://www.micor.com.eg/Default_ar.aspx?ID=8412</u>



Figure 6-8.

Source: Nasr Auto factory accessed December 5, 2022, <u>http://nasser.bibalex.org/home/main.aspx?lang=ar.</u> Source Egypt Archive accessed December 5, 2022 <u>http://archivegypt.com/.</u>



Figure 9-10. Models of the machines and looms used in the textile industry in Egypt Source: The Egyptian Textile Museum display, accessed December 5, 2022, https://www.facebook.com/egytextilemuseum/.

Egypt Textile Industry

Egypt's textile Industry theme presents the history of the textile industry in Egypt, where a model of the interactive textile industry highlights relevant aspects. The display is supported by an interactive screen to present the history of the textile industry in Egypt and industrial devices linked with the industry. The theme highlights the basic principles of handmade weaving tradition and the techniques used in weaving textiles that were inherited from the ancient Egyptians; along with the designs of their looms. Figures 9–10 show a case study with the related implementation details. Models of the machines and looms used in the textile industry in Egyptian civilization.

Egypt Heavy Ammunition Industry

The theme of Egypt's heavy ammunition industry will be presented using the interactive visual model with holographic projections, where Aziz Sidqi appears at the entrance to talk about the history of the industry in Helwan, focusing on the heavy ammunition industry. The display is supported by archival photos of the industry during the '60s in Egypt (Figures 11–12)



Figure11-12. archival photos of the heavy ammunition industry during the sixties period in Egypt Source: President Gamal Abdel Nasser website, accessed December 5, 2022 <u>http://nasser.bibalex.org/home/main.aspx?lang=ar</u>

Egypt Tire and Rubber Industry

This theme will be presented as a model of large machinery used in Egypt's rubber factories during the '60s.

Egypt Medicine Industry

The theme will display samples of products produced by the factories of medicine in Egypt during the '60s.

A special gallery

The museum has a special gallery focusing on the history of industrial machines in Egypt before the '60s; the gallery is under the supervision of the Cultural-Heritage Training and Education Center "Cult-HeEd," Helwan University <u>Cult-HeEd@hq.helwan.edu.eg.</u>

The Cult-HeEd aims to set an initiative to collect historical industrial devices before the '60s in Egypt; the plan of collecting the devices follows two directions.

First: accept donations from the Egyptian community, writing the name of every donor with a special memory or a personal story linked with the industrial device in the Butterfly wall at the Museum; Figures 13–14 show a case study with the related implementation details.

Second: buy and collect historical industrial machines that some of the antique shops in Egypt have; Figures 15–20 show examples of the industrial heritage devices in one of the antique shops in Nasr City.⁴⁰

⁴⁰ The researcher made the observation during a visit to the antique shop, 64 Ibn el Nafees st, from Makram Ebeid Nasr city Cairo, Cairo Governorate, Egypt, on December 7, 2022.



Figure 13-14. Butterfly wall; Source: Great North Museum Hancock Museum Newcastle England, accessed, December 5, 2022 https://greatnorthmuseum.org.uk/butterfly-wall.



Figure 15. of early stove called "Waboor" used during the thirties period in Egypt. Source: the official site of the Antique shop accessed, December 5, 2022 <u>https://www.facebook.com//اللعنية:336186616587871/</u>

The famous English telephone, "Pyramid," by Siemens Brothers in 1933 was one of the historical devices that connected with Egyptian events. Figure 16



Figure 15. Famous English telephone, "Pyramid", by Siemens Brothers ... production year: 1933, Source: the official site of the Antique shop, accessed, December 5, 2022 https://www.facebook.com//نالايتنا/-336186616587871/

The early version of a radio used in Egypt in the early 20th century is connected with the pioneering Egyptian radio station that started broadcasting on 31 May 1934 Fig 16



Figure 16. The early version of a radio used in Egypt, Source: the official site of the Antique shop, accessed, December 5, 2022 <u>https://www.facebook.com//محتاكيتن</u>

The Hand Gramophone with Big Brass Trumpet used in Egypt during the early 20th century is connected with the history of Egyptian classical music. Fig 17



Figure 17. the Hand Gramophone with Big Brass Trumpet, Source: the official site of the Antique shop, accessed, December 5, 2022, https://www.facebook.com//تاڭيتن

The "Continental" typewriter machine with distinctive Arabic letters with the name of the agent "Najjar" and the logo "Royal Crown" was one of the machines used in Egypt during the early 20th century The typewriter also has the name of the model "the Nile" Fig 18



Figure 18. The "Continental" typewriter machine Source: the official site of the Antique shop, accessed, December 5, 2022, <u>https://www.facebook.com//تاكيتنا/</u>-336186616587871/
The Cashier machine used during the early fifties in Egypt is one of the machines connected with Egyptian products and trade. Figure 19



Figure 19. The Cashier machine used during the early fifties in EgyptSource: the official site of the Antique shop, , accessed, December 5, 2022, <u>https://www.facebook.com//ibapio-336186616587871/</u>

A metal pencils sharpener that was used in the *early* fifties period in Egypt is connected with the memories of the Egyptian students Fig 20



A list of educational activities needed to support the display.

Hands-on objects for visually impaired Children highlighting the industrial heritage in Egypt. Figure 21 shows a case study with the related implementation details.⁴¹

Figure 21.



For Figure 21 the researcher took the photograph during a visit to the British Museum in 2018. Educational tables and educational sheets on the most important industries in Egypt. Figure 22 shows a case study with the related implementation details.



Figure 22.

For Figure 22 the researcher took the photograph during a visit to South Shield Museum in Newcastle, England, in 2016. Boxes offer educational kits, sheets, and replicas of industrial devices to be loaned to schools and used in community programs; they are available to visitors of the museum; Figure 23 shows a case study with the related implementation details.

⁴¹ The researcher took the observation during a visit to the British Museum in 2018.

Fig 23 Boxes contain educational kits, sheets, and replicas Photographed by the author during a visit to South Shield Museum in Newcastle, England in 2016



Figure 23.

Examples of worksheets and activities on industrial heritage education elaborate on the importance of museums as avenues of learning for children. Figure 24 shows a sample of such activities.⁴²

The Museum aims to display archival photos documenting the industrial product advertisements in Egypt in the 19th and 20th centuries; Figure 25 shows examples of the archival advertisements on industrial machines in Egypt.



Figure 24. A sample of industrial heritage education activities in England Source: Industrial Revolution Facts Worksheets accessed December 4, 2022, https://kidskonnect.com/history/industrial-revolution/

⁴² A sample of Industrial Heritage Education activities accessed December 4, 2022<u>https://kidskonnect.com/history/industrial-revolution/</u>



Figure 25. (Part one)

Fig 25 (Part one) examples of the archival advertisements on industrial machines in Egypt(19th and 20th centuries)Source: Egypt Archive accessed December 2, 2022,<u>http://archivegypt.com/</u>.





Fig 25 (Part two) examples of the archival advertisements on industrial machines in Egypt(19th and 20th centuries)Source: Egypt Archive accessed December 2, 2022,<u>http://archivegypt.com/</u>.

Fig 25 (Part three) examples of the archival advertisements on industrial machines in Egypt(19th and 20th centuries)Source: Egypt Archive accessed December 2, 2022,<u>http://archivegypt.com/</u>.

آلة ل اختراع مد يوعدني مصرّ بفضل الأشعة السينية يمكنك رؤية قدمك لنخوم في داخل الحذاء للنا أحد من حصولك على الحذاء المربح الذى يوافف قدمك تتامًا! تفضلوا الآت باختبارلفذا لاختراع الغظيم بقسم لأجذتم بمحلات Magic Chef ا لکبری الملوثة ا 233 2 10 الآن فصل الاجازات فلا تنسوا ان الاجازات تمضي ولا يبقى لكم من اثر منهما صور «کوناك» استعداداً لاجازاتكم جهز وا آلة ،كوداك، Da ba انه يسر جميع البـــائمين المروفين للمـــدات الموتوغرافية أرض يبينوا لكم تفوق آلات «کُوداك » ويمكنوکم من النجاح لاول و هلة آلات «کُوداك » ابتدا. من ۱۲۰ قرشاً וניות كوداك (معمر) شركة مساهمة تباع لدى جيزع مت - اسکندر به لالنعتاط انج 1:51. 11. ة دى اوتومنتيكياً/ وقام: الثقال أنه اطلب التفاصيل من أي محل بالإمتاق المحرى للعرفة می مادن سکر ۱۹۹۵ کرد مدد عود در (۲۱۰) موند این جريزيز أوبر علاصار و

Figure 25. (Part three)

Assessment and reporting stages in the policy document

This part aims to obtain feedback from Egypt museum visitors. It includes awareness of and reaction to industrial models in visitor surveys and record numbers of the museum website visitors, listing visitors' opinions on interpretation and education strategies. *The document may follow the following template*

Questions	Sub-themes
Rate your museum experience (if applicable).	Informative exhibits Easy-to-read labels Topics covered in the exhibits The marketing approaches are adequate Suggest improvement
The purpose of your visit	Tour the museum Research Curiosity
How did you hear about the museum?	 Newspaper advertisements or articles Television Radio Program Saw a flyer Received an email Through Social Media Sign on the road/Just saw it Other (please specify)
Do you plan to visit the museum again?	Other comments, questions, or concerns

Prioritize a policy timeline

The work analyzes the industrial heritage in Egypt museums and applies time-bound targets and measurable benchmarks.

4. Conclusion

More integrated national development strategies for interpreting industrial heritage can be designed. A strategy for managing the Industrial Heritage in Egypt can pave the way to enable efficient development, interpretation, and preservation of the Egyptian industrial heritage. Industrial heritage has been a topic of interest since the beginning of the industrial revolution in the second half of the eighteenth century to date. It has scientific and technological value in the history of engineering, manufacturing, and construction. It provides evidence of activities that have profound historical consequences. Documenting aspects of the industrial heritage can provide evidence of activities, tell stories, and increase the sense of identity and understanding of cultures. Intangible aspects of industrial heritage and the memories of people involved in any industrial activity are unique and irreplaceable resources. The measures for conserving the industrial heritage require a thorough knowledge of various industrial processes that may have occurred in industrial sites. The human skills involved in many industrial processes should be carefully recorded and transmitted to younger generations.

Industry collections on display at museums are more than just material objects, where they have meaning, value, and significance and are associated with people and events of different values. Industrial heritage collections are large and special; the technique of interpretation can pave the way to engage museum visitors with the richness of industrial objects. Industrial heritage categories that should be interpreted include

Extractive Industries (e.g., Ore- or Gold-mining) Bulk Products Industries (e.g., Primary Metal Industries) Manufacturing Industries (e.g., Machine Manufacturing) Utilities (e.g., Water Supply, Electricity) Power Sources and Prime Movers (e.g., Water wheels, Steam turbines) Transportation (e.g., Railroads, Channels, Harbors) Communication (e.g., Radio, Telephone) Bridges, Trestles, Aqueducts Building Technology (Roof systems, Fenestration) Specialized Structures / Objects (e.g., Dams, Tunnels, Hydraulic works)

The classification of World Heritage Sites was initially prepared in 1999 by the World Heritage Centre in collaboration with ICOMOS for a World Heritage poster series that included "industrial heritage." It noted that the industrial heritage embraces 5.3% of all cultural sites and 4% of all World Heritage Sites. The composition of cultural (including industrial) heritage differs per region. Twenty-two industrial heritage sites are in Europe and North America, four in the Latin America and Caribbean region, and two in the Asia and Pacific region. In Africa and the Arab States, there are no industrial sites on the World Heritage List. The 2018 classification of World Heritage Sites defines three tentative sites with industrial value and eight sites with associated industrial value, inscribed in the Arab States region. Out of the three tentative sites with

stated industrial value, one is classified under "Bulk Products Industries," with a commercial center for the metallurgical industry of gold, iron, and copper in Mauritania. Under "power sources and prime movers," there is an exceptional water wheel system in Hama, Syria. "Specialized structures and objects" shows a "Fajal" ground and subterranean canal system in Oman.

Regarding museums with industrial heritage collections, education activities are linked with the interpretation approaches. Good examples of interpreting industrial heritage are the industrial heritage sites worldwide, where the context of discovery is the key to the interpretation process. Interpreting the industrial process in museums can be elaborated by displaying the manual manufacturing process from the basic process of production to a finished product. It sheds light on the skill of the people in using machines as industrial devices to reveal intangible practices. Interpreting industrial devices of transportation reveals several challenges for interpreters; visitors can be involved in the exhibition for the experience. Thus, the interpretation of industrial heritage can be applied through participation, where visitors are encouraged to participate in single manual tasks, such as hand-grinding grain or spinning wool. This activity aims to bring the visitor into closer contact with the materials linked with the industrial devices (e.g., wood, stone, and grain). Such participation aims to engage visitors with the skill and value of an industry. Among the interpretation approaches of the industrial heritage is to interpret the product of industry without merely selling them. The interpretative philosophy presented by Marion Blockley and Alison Hems defines all aspects of heritage interpretation. First, the interpretation of heritage aims to be inspirational, striving to enhance people's lives and deliver true benefits, thus enabling visitors to understand the core value. Second, the interpretation must resonate with people's lives, where learning is a life-long activity; therefore, layering interpretation to suit different needs is the key aspect.

This study analyzes the cases from Egypt's museums and their counterparts in England. Relations between Egypt and the United Kingdom are longstanding; most of the industrial objects displayed in the museums of Egypt are British-made. The comparative analysis of this research enhances the understanding of the context of the industrial heritage in the museums of Egypt. It highlights similarities and differences between Egypt and the United Kingdom in terms of the interpretation of the industrial heritage.

The interpretation of industrial heritage in the case study museums regards how they communicate collections to visitors. Museums of England explain and help people understand, with their senses, the evolution, and development of science, technology, and industry, working through educational, environmental, and marketing programs to preserve the industrial heritage. The industrial heritage on display at the museums of Egypt must follow a specific policy document on the international trends in interpreting the industrial heritage.

The museums in Egypt and England present an informative record of the history of transportation, textile, and irrigation. The interpretation techniques are not similar in both cases, where such techniques depend on space, collection, and marketing platforms. The Egyptian museums have no identification signs inside the museums' location or effective marketing platforms; whereas the London industrial museums are ideal in such aspects. Most of the Egyptian museum visitors are primary school students. The London industrial museums are interactive, with various visitors. They use advanced interpretation methods, such

as interactive screens and educational activities, in the main display. The Egyptian industrial museums use classical methods. The London industrial museums have many facilities and activities for visitors, such as a gift shop, cafeteria, theater, and programs for families. The Egyptian industrial museums must set educational programs per a clear policy.⁴³

The researcher presents a formal policy document to highlight the skill of the people in using machines as industrial devices and reveal intangible practices. The document presents a frame of education programs to create a range of positive, stimulating experiences for audiences throughout their visit and considers the nature of industrial heritage on display in the education environment. The researcher then presents a model of the project scenario of an industrial heritage museum highlighting the international trends interpretation guidelines.

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