Current Status and Problems of Utilizing Digital Contents in French Museums

Kim Daewoong
Kyushu University
dwkim@design.kyushu-u.ac.jp

Hoshino Koushi
Kyushu Sangyo University
hoshino@ip.kyusan-u.ac.jp

Lee Joongyoup
K-soft
youp0827@gmail.com

Abstract
The present research has visited and researched French museum activities and interviewed the person in charge, where the country has conducted a cultural policy as a national policy. The research has verified museum contents applications which are a part of the cultural policy supported by the information policy of France and has considered the way Japanese museums should be in the future. Gained knowledge is reflected to personal museum concierge at Kyushu National Museum promoted by Kyushu University Contents Design Laboratory. This project suggests processes for leading exhibition facility digitalization and attempts to enrich the museum-visitor relationship. Specifically, it collectively produces exhibition halls data processing with digital technology, constructions for accumulable environment, cultural asset digitalization and utilization as contents, and correlation of preparation with review, and aims to indicate a course for exhibition facility digitalization.

Keyword：French cultural policy, digital contents utilizations, museums education

1. Preface

In these past few years, facility museums in Japan which are suffering from deficiencies of the workforce and budget are struggling to grope for the way they should be in communities, for example, they are actively seeking to cooperate with communities as central points of cultural information and serving to stimulate education and culture art. Irrespective of countries, museum alienations of young people are getting worse and require effective solutions. For example, we can expect variety of applications of digitally archived cultural assets. However, this contains problems such as the budget, workforce, and rights. According to the concept of digital museum, digitalized cultural assets should not just be “accumulated” but also “linked” and “applied”†[1]. However, this kind of cultural policy and information policy at museums are still not sufficient. This is why the present research has visited and researched French museum activities and interviewed the person in charge, where the country has conducted a cultural policy as a national policy. The research has verified museum contents applications which are a part of the cultural policy supported by the information policy of France and has considered the way Japanese museums should be in the future.

2. Research backgrounds and objectives

Advances in information technology triggered museums in Japan to introduce digitalized exhibition information and exhibition exposition mobile devices. However, digital archive projects, basis of museum digitalization, still lack a standard model. Created digital information lacks in universal use due to its single purpose and device dependency. Historical museums persist to genuine exhibition, a big barrier for digitalization and introduction of new exhibition experiences. Under these situations, the present thesis aims to probe the future of cultural policy and contents utilization at museums by studying developments and examples of a cultural policy and information policy at museums in France, the world focus. Gained knowledge is reflected to personal museum concierge†[2] at Kyushu National Museum promoted by Kyushu University Contents Design Laboratory. This project suggests processes for leading exhibition facility digitalization and attempts to enrich the museum-visitor relationship. Specifically, it collectively produces exhibition halls data processing with digital technology, constructions for accumulable environment, cultural asset digitalization and utilization as contents, and correlation of preparation with review, and aims to indicate a course for exhibition facility digitalization.

3. French information policy movement

3.1 Europe Internet environment toward broadband

According to ITU†[3] report, internet users are now over 1.4 billion worldwide and IT users are increasing on a global scale. In particular, "The Global Information Technology Report (Figure 1)" published by WEF (World Economic Forum) every year releases world ranking of IT competitiveness based on the evaluations of 67 categories about IT usages at each country. The ranking changes drastically every year which suggests fierce IT investment at each country, with economically advanced nations at the center. The movement of the past two years is shown in Table 1.

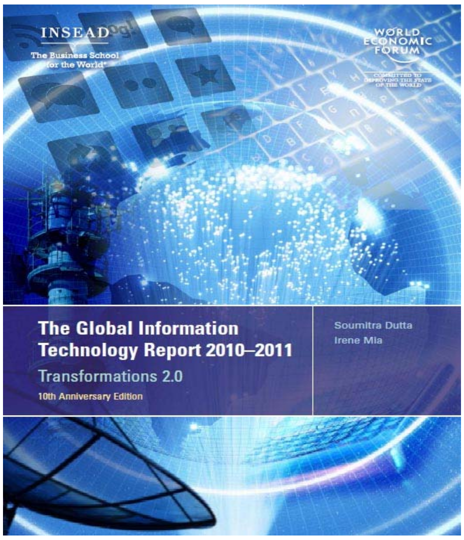

Figure1. The Global Information Technology Report 2010-2011 (WEF : World Economic Forum)

Table 1. 「The Global IT Report」 (http://www.weforum.org/gitr)

2009 Rankings			2010 Rankings	
1	Sweden		1	Sweden
2	Singapore		2	Singapore
3	Denmark		3	Finland
4	Switzerland		4	Switzerland
5	The United States		5	The United States
6	Finland		6	Taiwan and China
7	Canada		7	Denmark
8	Hong Kong		8	Canada
9	Netherlands		9	Norway
10	Korea		10	Korea

Amid intensive worldwide IT competitiveness, the Internet popularization in Europe showed in Table 1 is at a high level and more than half of the countries in 10th places at the report are European countries. Statistical data about world information market updated by ITU every two months reports that besides the internet popularization, broadband subscription rate is at a high level after North and South America as shown in Figure 2. European countries are now IT developed countries leading the world. Internet population and broadband population in France are surging accompanying broadband infrastructure constructions (Figure 3, 4). Government states a new objective to enable half of the population to access optical fiber and four millions people to subscribe to it.

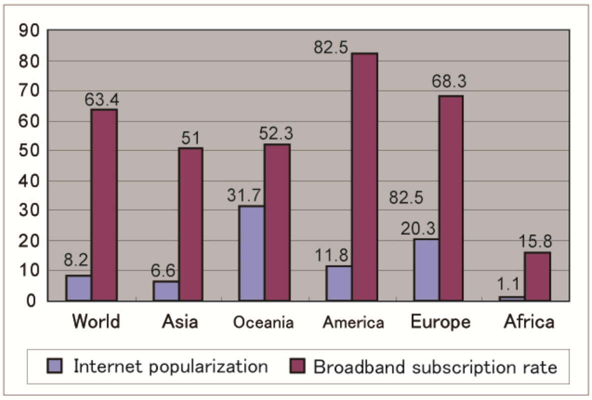

Figure 2. Internet popularization and broadband subscription rate (2010 White Paper Information and Communications in Japan pp.169-170, Ministry of Internal Affairs and Communications)

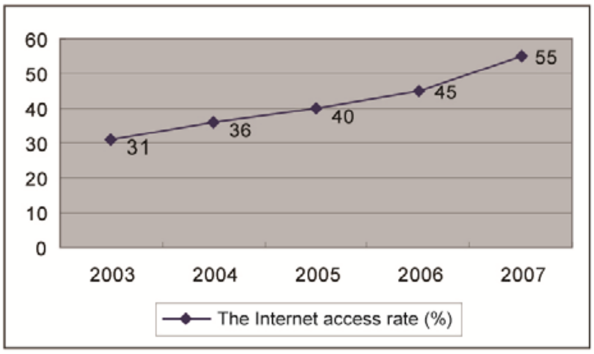

Figure 3. The Internet access rate transitions in France

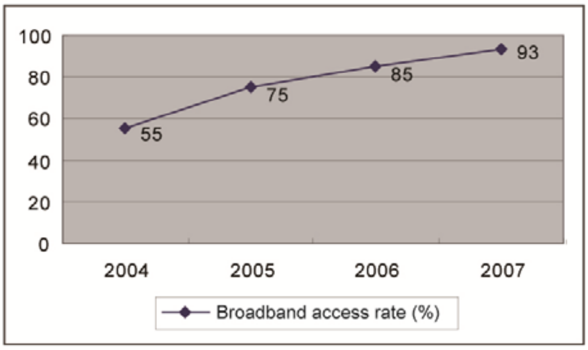

Figure 4. Broadband access rate transitions in France

3.2 France left behind by Internet development

France has gradually gained competitiveness among European countries advanced in IT field but used to be left behind by Internet popularization. Media services developed from 1980s nationwide such as Minitel is one factor. Minitel is similar to CAPTAIN system in Japan and is the device name of Videotex†[4] which has combined a phone and a television. Some of those devices had multiple functions providing a phone number guidance, time signal, forecast and aural town guidance including traffic report, art museums and museums guidance and movie guidance. It seemed that French Minitel was leading the world, exclusively succeeding as Videotex systems but France had fallen a long way behind with the next communication technology due to the relief from Minitel success and rejection of foreign languages.

3.3 Government struggles for information society

"The governmental action program†[5] promoting the development of the Information Society in France (PAGSI)" stated by Prime Minister Lionel Jospin as an information policy in January, 1998 prioritized six fields†[6], 1) education, 2) information contents enrichments and cultural policy, 3) modernization of information service, 4) corporate commercial transactions, 5) information communication technology development, and 6) information security protection. With a mind to new information communication tool service, devices, internet connection, and multimedia teaching materials have been provided to educational institution. French cultural asset access enhancement and globalization have been sought by digitalizing French cultural asset, distributing it by the Internet, and establishing Espace Culture Multimedia. In addition, digital divide solution has been carried out by provide all people the Internet access, apprehending the network access gap in society or regions†[7].

4. Cultural democratization at French cultural policy

4.1 French tradition in cultural policy

Educational and cultural fields are at the center among the French information policy priorities.

Table2. 6 priority areas in government's action program for information-oriented society (PAGSI)

Priority area	Policy
1. Education New information & communication tool in education area	1.Global approach in education -Utilize information & communication tools in the places of education.. - Give priority to training teachers 2. Furnish necessary devices in educational institutions where the internet can be connected. - Give a choice to each site - Put emphasis on balance and coordination. - Form a partnership actively with local institutions or enterprises. 3. Prepare and distribute teaching materials and scientific materials - Support the market for 「French multimedia for education」
2. Culture: Ambitious cultural policy responding to new network	1. Support multimedia publications and services,- Financial support targeting to information technology. - Continue making efforts to harmonize the tax imposed on literary works with EU level. 2. Digitalize French cultural assets and distribute the cultural contents through the internet. 3. Master the information technology tools related to culture. - Establish multimedia cultural center to make efforts in edification. 4. Make efforts for international distribution of French culture and French language. - Make it easy to access French cultural assets and promote its globalization. - Make the use of information & communication technology be helpful in distribution of of French culture and French language.
3. Information technology as a means of modernizing public services	1. Allow the public to access each governmental information through the internet. - Connect the government to on-line. - Train the staffs.
4. Enterprise IT: Tools essentially requested to enterprises	1. 「Computerizing enterprises」 2. Promote the development of e-commerce 3. Strategically-important points and problems of information
5. Industrial modernization and technology innovation. Innovation and research	1. Promote innovation 2. Policies to promote and foster research and development 3. Reinforce the reaction of France toward the advance of internet. 4. Strengthen the basis of France regarding new networks and new information & communication technologies.
6. Frame of regulation: Promote the appearance of efficient regulation and establish a frame to protect new information network	1. Regulation applied to new information network 2. Develop effective format for encryption 3. Reinforce the safety of national information system/network 4. Protection from new kinds of threat

This kind of French government tradition to see much of education and culture has been influence a lot by cultural policy in the past. Traditional mecenat (literature patronage) at Ancien regime(Bourbon kings before the French Revolution, 16 ~ 18 century) under absolute monarchism protected artists and scholars in exchange with their contributions to monarchism propaganda. After revolutionary period(Around in 1790) ,mecenat tradition has changed †[8] into democratic mecenat in the present day declaring the freedom of art creation and intelligent expressions. Louvre Museum †[9] is a typical example (Figure 5). French tradition to seek "culture democratization" has been passed down generation to generation. For example, Louvre Museum actively conducts external activities similar to "class on demand" conducted at museums in Japan. This is also a policy of Louvre Museum originally conducting the Constitution Preamble "The Nation shall guarantee equal access of children and adults to education, professional training and culture," adopted in 1958.

Figure 5. "Louvre Pyramid" at the Louvre Museum entrance

Class-on-demand activities(Outreach program) can be categorized into three †[10].

1) Prisoner support

This is conducted for prisoners imprisoned for their punishments thus cannot visit the museum. A guide visits a prison with minute copies of sculptures and gives a lecture and holds a workshop. The workshop gives time to create paintings and drawings, for example. Sometimes art catalogs are donated to prison libraries.

2) School support after 9.11

After 9.11, every school in France tends to think "events such as excursion trips and field trips in which a large number of students go out should not be conducted because it is dangerous." Even though being under this condition, equal education and cultural opportunities have been guaranteed by art museums steady effort. One example is that Louvre Museum sends guides to schools in Paris and conducts a class on demand.

3) Local museum support

This is a new program in which Louvre Museum and art museums in other areas have cooperated. For example, children in Southern France visit ancient Rome ruins and art museums near their school and create the mosaics of what they saw.

4.2 Equal access to education and culture and museums struggle

Centre Pompidou(Figure 6) was built based on the ideal of President Georges Jean Raymond Pompidou which was "I would like to build a cultural center in Paris which is an art gallery as well as the center of creation, and where plastic arts coexist with music, movies, books and audio visuals." The centre has twenty three thousand people visits a day on average and over seven million people visits a year.

Figure 6. The view of Centre Pompidou

Figure 7. Workshop in front of art museum collections

The Young Public Programming Department at Centre Pompidou does not only plan a workshop but also takes charge of workshop venues and books, and exchange with overseas. This section has 17 staff and ten staff out of them direct each project. Besides, there are ten guides called animators. Centre Pompidou, as shown in Figure 8, conducts workshops at expositions and ateliers twice or three times a year each lasting for five to six months.

Figure8.Workshop at Centre Pornpidou

Workshop participants are fifty thousands to seventy five thousands a year. Admission to Children's Gallery is free for children if they are accompanied by guardians. Workshops for elementary school children groups are conducted on weekdays and those for individuals and families are conducted on Wednesday and weekends. There are three kinds of workshops: 1) those related to Children's Gallery themes, 2) those related to the art museum collection theme as shown in Figure7, and 3) those related to themes of the art museum or other centers such as a theater and a library. The strength of Centre Pompidou is the variety of themes and a wide range of choice †[11].

5. Museum information policy and education support

5.1 France works on cultural asset digital archive

"Liberty, equality, fraternity", the principle of French Revolution flared in opposition to Ancien regime is still alive in France and has been traditionally inherited as education in cultural policy and equal occasions of culture. Education and culture were considered as the center field of information policy. As IT(information Technology) is advanced and borderless informationization computerization is accelerated today, French government devotes itself to archiving cultural information not to repeat the mistake in spreading the internet. The origin of digitalization in nowadays France is a project called "general catalogue" (Inventaire general). This was started by André Malraux, then Minister of Cultural Affairs, as a project to record all cultural assets as a catalogue taking the opinion of art historian André Chastel in 1960s. In the beginning, it was extremely difficult. Julian Cain, the first chairman of Commission Nationale Chargee de l' Inventaire Geneeal des Monuments et oeuvres d' Art de la France, raised three objectives to pursue accumulation of massive information: 1) to "identify" (identifier) all standardizable things on the earth in the manner that enlightens the related people's minds, 2) to "research" (etudier) and categorize relics and art works in the manner that they are memorized nationwide using the most high efficient technology, and 3) to "utilize index data" (exploiter le thesaurus) made in that manner and to provide updated materials to administration, examinations of community development projects, community and national history, education, and leisure. The project has changed into a variety of shapes but it has been continued till now at Cultural Asset Department †[12]. Information processing systems by computers were introduced and building database of letters/images was the priority objective in 1970s. Ministry of culture has started various database services with database software called "MISTRAL" developed originally by France. The services include the aforementioned "general catalogue." Artworks of museums throughout the country are recorded in "JOCONDE" (Figure 9) managed by Museum Department including 137,500 database and 24,000 images. Archived database related to cultural asset is database such as MNR, ARCADE, NARCISSE.

Figure 9. "JOCONDE"

(http://www.culture.gouv.fr/documentation/joconde/fr/pres.htm)

5.2 Louvre Museum struggles for digital archive

France has started digitalization of museum artworks in EU countries besides approximately 1,200 national and other public museums in France from 1990 and Centre de Recherche et de Restauration des Musées de France (C2RMF) is at the central position. It preserves and restores paintings and sculptures of museums throughout the country as well as studies methods of fabrication. Louvre Museum is in the position to lead domestic digital archiving and has registered data for a long time where the C2RMF is established. Louvre Museum has worked on digital archiving on the ancient Greek/Rome department for the longest time, for twenty five years and the archive is called Jupiter database †[13]. Depending on genres, areas, and eras, Louvre Museum has eight curatorial departments: Near Eastern antiquities, Egyptian antiquities, Greek/Etruscan/ Roman, Islamic art, sculpture, decorative art, painting, and prints and drawings. Among these, digitalization is most advanced in prints and drawings department because the extreme fragility of the artworks overall forces to replace exhibitions almost every three months. The department has digitalized its artworks in advance of other departments so that the artworks can allow access at all times. Accompanying digitalization, database is also established and currently 120 keywords are available for artwork research †[14].

Digital archived data at Louvre Museum is partially available to the public at this moment such as Atlas which can search for thirty thousand artworks exhibited heretofore, Inventaire informatisé des Arts Graphiques (http://arts-graphiques.louvre.fr/fo/visite?srv=home) which records over fourteen thousand catalogue data of prints and drawings and information on four thousand five hundred drawers, and database which has recorded over seventeen hundred artworks of American artist La Fayette. However, these data is only a part of the artworks Louvre Museum possesses. Database available to the public is currently restricted to those exhibited in the past but there are an enormous number of collections, over twenty times of the exhibited data. That is, only below five percents are exhibited and it can be calculated that there are at least seven hundred thousand artwork collections (Figure 10).

Figure 10. Louvre Museum with hundreds of thousands of collections

The aforementioned Atlas database is developed for the public and is different from database used for collection digitalization at Louvre Museum. The eight departments respectively have authority so database creations have been conducted separately for a long time. Each department has already started digitalization from around ten years before but since different software is used, currently they are working on the integration of the software. This is a work to pick out common factors and integrate into one database while leaving uniqueness of each field. Each field originally has different collection characteristics and historical and cultural backgrounds, thus has never collaborated and has been individually creating database. However, accompanying the advance of hardware and software technology these years, it became highly possible to establish database common to all, which led each department to start working together. Interior database is academic and search fields are complicated so information is currently only available for curators but solving the problem of "how to choose and integrate information at each department" available for general audiences on the Internet will likely to enable digitalized exhibition. The work is still underway and some researchers say people can enjoy artworks only by visiting museums and gain artwork information at each browsing room. Copyright processing issues on artwork images in addition to exposition texts are to be solved in order to make the information open to public †[15].

5.3 current situations of education support and digital contents cooperation at museums in France

French course of study (Programme) divides elementary education into basic learning period (nursery school senior class - second grade) and deep learning period (third grade – fifth grade) and each period has art education period as their priorities. Lowest maximum time is three hours for art education, over ten percent out of twenty six hours the time for all subjects. The Ministry of Education, Science and Culture stipulates that drawing and crafts class hours should account for 6 – 8 percent at the lower classes and 5 – 6 percent of all at the upper classes at elementary school in Japan†[16], which infers that France is giving higher priority to art education than Japan†[17]. France originally composes semesters and class curriculums based on the thought "learning rhythm" and adopts a "7-2 rhythm" category in which students take a break for two weeks after seven weeks of class and which sets a holiday on every Wednesday as "religious education day." Louvre Museum is available for teachers every Wednesday and support art education, called "Mediatheque." It lends books related to each eight departments and audio tapes and CDs of lectures at Louvre Museum heretofore, and database for teachers is available without restraint and accepts consultation with a curator at study space. Louvre Museum prepares education programs for teachers and leaders at the museum and they are divided into three types: programs for 1) leaders accompanying class, 2) those who attend lectures and the events at a hall, and 3) lecturers.

First, programs for 1) leaders accompanying class;

- when a teacher leads, they introduce Mediatheque and Atlas database and recommend advance consultation.
- when a curator accompanies and guides, the theme for the year is already prepared.
- workshop: programs are divided into those for elementary class excluding kindergarten (three programs), elementary lower classes (9), elementary upper classes (16), elementary school – university (4), and high school and universities (8). The number of

programs for elementary upper classes is the highest and occupies forty percent of all the programs.

Next, programs for 2) those who attend lectures and the events at a hall have the followings:

-Various lectures for general public introduce movies, dramas, and concerts in particular.

-one-person exhibition related to contemporary artists who prioritizes art history,-educational lectures

Lastly, programs for 3) lecturers include

-basic guidance lectures on appreciation in the museum

-lectures on permanent exhibition: it has thirteen themes a year such as “portraits,” “Italian Renaissance,” and “formation tradition at Egyptian art.”

-Lectures on thematic exhibition: e.g. “Babylon” and “Louvre photo exhibition during the world war”

-lectures related to partners: themes are related to Louvre Museum partners.

these program contents show that education support at museums mostly takes place on the spot and the museum staff in charge of education is responsible for training leaders and providing support. Basically, workshops and education on the spot are the focus at Louvre Museum and programs of all the workshops count up to forty every year. The majority is for learning practical paintings. For example, they include tiling in order to make plaster as Romans used to use. Programs for little children include listening to Islamic folktales, appreciating real artworks to see how animals from the folktale appear to Islamic art and creating mosaic of the animals. These education supports will encourage teachers working at school in Paris. IT technology is indispensable for teachers working at suburbs and for those who cannot visit the facility so often in order to cooperate with the museum because they utilize digital contents from online database and contact a curator by email. In fact, website for educators as shown in Figure 11 has various search categories and a collection of works along a theme and myspace have album function and memo function which can attach an explanation on a slideshow and those they have searched on their own.

Figure 11. “education.louvre.fr” (http://education.louvre.fr)

Many museums other than Louvre Museum have developed original educational programs. Centre Pompidou has established homepage “Junior” (http://www.junior.centrepompidou.fr/) (Figure 12) which publicizes contents with three characteristics for kids to study by themselves at home. It explains artist creation activities, artists themselves, and collections the museum possesses.

Figure 12. “Junior”(http://www.junior.centrepompidou.fr/)

Besides, educational materials, as shown in Figure 13, for kids called “Zig Zart” published by the center two or three times a year explain detailed differences of each work so as to encourage discoveries about works at the museum. The name is derived from the idea of zigzagging through the works or the theme.

Figure 13. “Zig Zag” published originally by Pompidou

6. Digital contents utilization as culture and information policy

6.1probe into new art experience of French museum

Recently, an increasing number of famous art museums are building branch museums in provincial cities in France. Louvre Museum is advancing a project “Louvre Lens” (Figure 14) to make a branch museum planned to open in 2012 in Lens, a provincial city located in the north of France.

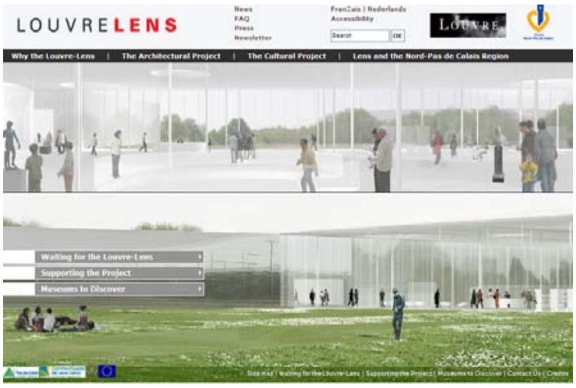

Figure 14. "LOUVRE LENS" (http://www.louvrelens.fr/en/)

Louvre Lens plans exhibition activity including educational effect not only LOUVRE-DNP MUSEUM LABO (http://www.museumlab.jp/) (Figure 15) exhibition technology which Dai Nippon Printing Co., Ltd., a Japanese corporation, is leading and simple mediation†[18]. Therefore, Louvre branch museum in Lens is expected to be totally new concept facility unlike heretofore such as the way to manage works and exhibition methods. Paris main building has eight departments depending on genres, areas, and eras but Lens will not take that kind of exhibition style and will exhibit works transversely aiming at an experimental antenna art museum. As a new mediation, an exhibition with more digitalized means is planned.

Figure 15. "LOUVRE-DNP MUSEUM LABO"
(http://www.museumlab.jp/)

Centre Pompidou has completed branch museum in Metz in 2008. Metz is a factory town near the border with Germany with approximately a hundred and twenty thousand people located in the east of France. The branch museum displays in a variety of new ways replacing collected works lying in Paris main museum. As referred in the previous chapter, France is a centrally governed state where regional economy and culture showed a considerable decline. Minister of Culture Jean-Jacques Aragon (2002~2004) has positioned branch museum plans of Louvre and Pompidou as a pillar of "cultural decentralization." Taking an elite oriented cultural center to provincial cities as oneself like Minister of Cultural Affairs André Malraux conducted does not let original tradition in the region to be succeeded to the future. Residents may fiercely oppose to elitism thus emasculating. Reconsidering cultural policy of Malraux, it is indispensable to seek to stimulate a new tradition by establishing landmark that administrations and corporations have contrived to gather people taking regional advantages and traditions into account. Louvre Lens and Pompidou Metz can be considered as those cases.

6.2 Louvre toward new art appreciation support

New project called Project Pyramid is proceeding at Paris main museum. It is a project to expand underground Louvre space because of an increasing tendency of visitors worldwide and is supposed to be completed in 2017. Mediatheque†[19] called Cyber-Louvre terminal enables people to search fourteen thousand pieces of lecture records such as books, pictures, and movies of which took place at Louvre. Currently detailed contents cannot be referred neither on Cyber-Louvre nor the Internet website. After the completion of Project Pyramid, not only works information but also details of archived digital content information will be available at the museum. Accompanying this project, new digital technology is introduced so that the museum will function as a material center as well. Multimedia guide is developed to be introduced in September, 2007, available for aural exposition and positioning (Figure 16).


Figure 16. Louvre Museum multimedia guide

My page registration during appreciation has become available from April, 2008 and people can watch the pages after going back home registered at personal my page at Louvre Museum Website. People can reread expositions and artwork afterward even if they could not read and appreciate at the museum (Figure 17).

Figure 17. Louvre Museum aural guidance website "monguide.louvre.fr" (http://monguide.louvre.fr/)

As time elapses, art appreciation ways and art museums are changing so new communication pattern is in search which will renovate conventional static artworks-appreciator relationship. The aforementioned Lens branch museum supposed to open may enable these radical attempts.

7. Discussion

The present research probes the future of museums in Japan, especially a way toward digital museums to harmonize with tradition by studying the developments of cultural policy and information policy and museum contents utilization in France where many traditional art museums exist and highly evaluated at its activeness in introducing leading technology. In summary, this thesis has its significance in calling attention to traditional museums in Japan (especially historical museums) and urging countermeasures by investigating the historical efforts toward informationization of French museums. An important concept of the text is that various programs and contents have developed from a struggle for "guarantee on equal opportunities of education and culture", democratized cultural policy and information policy in France. It has been confirmed that those activities raised citizen consciousness and history and technology are coexisting. What is most important is the relationship between a museum and a visitor. European society positions and museums in relation with citizen consciousness and links them. The state of museums is important as the development place of citizen consciousness. Museums are not the place for education but the place where citizens grow. Not only lectures and learning at museums but also attracting aspects and utilization by local people are important. From this point of view, an effective way to arouse understandings and interests toward new works is museum digitalization by digital archiving. IT utilization at museums ranges widely from general office work, collections database, a two-way display, 3D restoration exhibition, to website management. Although digitalized information has become familiar a lot, not much research takes place at the actual museums. Museums have many issues hampering digital archiving. For example, appropriate digital archive building is influenced by insufficiency of budget and workforce, and copyright. Due to this, many museums having difficulty in finances cannot utilize digitalized information and enormous amount of digital data is accumulated every day. Interests in IT utilization is high in art specialists and those concerned with museums but archeology field has many traditional parts. The point of historical museums is "appreciation" even if it can be said exhibition. National museums are typical examples in appreciating cultural assets. However, as it can be peeked from activity examples of museums in France, exhibition is communication and message so conversation between visitors and museums should exist and thus will become related to the growth of citizen consciousness. It is important to preserve a thing as cultural asset like value preservation museums but rather than raising museums' value by preserving precious things, it has been prioritized to provide information using the thing and to contribute to the regional society. Therefore, the objective should be next generation value creation museums. Directions toward information museums using information utilization and information sharing by IT technology can be summarized into the following three. First, it is to create 3D virtual museum. Not only in the West but it is also in Asian countries where the rapid and extensive digitalization of cultural asset information is taking place. Digitalization has taken many forms starting from book digitalization, building multimedia database using pictures and images, to 3D scanning of real objects. After the releasing a movie "Avatar," 3D market is enlarging but 3D contents are badly insufficient so 3D contents utilization of collections at museums has new potential for financial independence. 3D contents utilization at museums are considered to increase the case using a single 3D model collection. Ultimately, participative virtual museum like second life by 3D will appear and users will communicate each other and create subjective and creative cultural space. This is likely to lead to building network of gigantic museums or cultural asset. Second, it is the popularization of culture information service accompanying museum ubiquitous. The development of the Internet and mobile technology will lead to popularization of computers to the extent that people are no longer aware of them and will make network available at anywhere and anytime to gain information. An example of this at ubiquitous museums is the advent of mobile exhibition exposition support devices in many forms in place of conventional aural exposition devices. However, those with easy systems for information operation containing contents suitable to a user's taste and level can be hardly seen. The problem of aural exposition devices and PDAs often seen at museums is that only technology and systems are developed and contents are not rich. Hardly people study and evaluate how a visitor is using the device. It is required to study the real usages of exhibition exposition mobile devices and to develop mobile exhibition exposition support system which considers intuitive interface development and visitor-exhibit and visitor-exhibition relationship. Third, it is to share next generation web and two-way information. The Internet we use now is rapidly developing aiming Semantic Web, the next generation web. The web enables information sharing between museums, metadata utilization, and ontology utilization and thus making it easy to enhance search efficiency, automatic processing, and customizing. Cooperating with social network service (SNS) will enable to provide contents users are subjective. Still, there are problems like copyright but it can be considered that traditional one-way information disclosure at museums will end and will change into two-way communication. The system with enormous amount of knowledge available when needed is expected to be used as a rich information source at preparation and review, or life study and can be expected to play the role of promoting citizen consciousness growth, education support and digitalization. The above suggestions of the directions of museum digitalization are already starting to realize. We should think about what we shall do in this kind of dramatically changing society. Japanese museums look like they are leaving citizens behind and not doing well to fuse history and technology. Based on the directions of museum digitalization, practical approaches will be implemented.

References & Note

1 "promotion of community cultural digitalization project (digital museum plan)"＜http://www.digital-museum.gr.jp /service_support/de002.html> 2011.7.15

2 Personal Museum Concierge: a project Kyushu University and Kyushu National Museum collaborate. A series of feedback is implemented seamlessly at suggestions of automatic design of exhibition contents focused on visitors and new route design based on quantitative evaluation and analysis of viewing behavior.

3 International Telecommunication Union (ITU) is a professi onal institution of United Nations established in aim to esta blish standardization and regulations among every country at radio communication and telecommunication field.

4 Videotex (or "interactive videotex") was one of the earliest implementations of an "end-user information system". From the late 1970s to mid-1980s, it was used to deliver information (usually pages of text) to a user in computer-like format, typically to be displayed on a television..

5 PAGSI : The governmental action programme promoting the development of the Information Society in France

6 KANEKO Toshio ,IT Policies of the Major Countries and Economies No.6 France.. Vol.48.No8.pp539-546(2005)

7 Japan Information Processing Development Corporation High-tech information technology Distribution Group Report, Trend of Information Technology Policies in Advanced Countries, pp5-19(2000) .

8 Some of the examples can be the establishment of Cultural Intervention Fund (FIC：Fond d'Intervention Culturelle）in 1971, Interministerial Committee for Cultural Development (Conseil interministériel pour le développement culturel）and Cultural Charter in 1975.

9 For Louvre Museum, an Act was legislated to change from royal palace to public museum on August 10, 1793, which was officially opened on the first anniversary of the Republic of France.

10 Mr. Frederique Leseur. Adjointe au chef du service des activities educatives et culturelles, Direction des publics

11 Ms. Nadine Combert. Centre Pompidou, educatives et culturelles, Direction des publics

12 Nishino yosiaki, museum studies―French culture and strategy,pp61-78,The University of Tokyo publication（1995）

13 Jupiter is also said as Jupiter, Roman God

14 Ms. Agnes Marconnet, in charge of digital archive at Louvre Museum

15 Agnes Marconnet interview.

16 Government guidelines for teaching primary and middle school students noticed on March 28, 2008.

17 Akira Ninomiya、School of the world、pp44-47、Fukumura publication,（2006）

18 médiation：Originally, it indicates the behavior of informing information and messages using tools and Louvre Museum views it as the behavior of informing information and messages using media of appreciators.

19 Mediatheque: a coined word derived from library (bibliotheque) and media. It means the facility of accumulating various information media and materials related to IT as a media library.

20 Centre de Recherche pour l 'Etude et l 'Observat ion des Condi t ions de Vie"La diffusion des technologies de l'information dans la société française"(2007)pp.47-63

21 La documentation française "Statistiques de la culture chiffres cles 2007"pp.53-60

22 Musee Du Louvre "Rapport D'Activite 2006"pp.143-144