

Application of Historical Resources for Geographical Data in Japan

Goto, M.

National Museum of Japanese History, Japan

Abstract

This paper shows the use of historical resource information as digital data and its application of the geographical information. It also examines their significance. Digitizing information of historical and cultural resources generally has two meanings. First, displaying information of cultural resources as a regional information enables the local residents to approach to these cultural resources more closely. Second, anyone can make actions to conserve historical resources in case of disaster. Focusing on these advantages, this paper introduces a project by the National Museum of Japanese History (NMJH), and explains our digitization of the rekishi minzoku chosa card (a card catalogue of historical and folklore surveys conducted by the Agency for Cultural Affairs in Japan between 1972 and 1974).

1. Project of Contracting Historical Resources Database in NMJH

NMJH is currently promoting the project of Integrated Studies of Cultural Research Resources (ISCRR project). The ISCRR project approaches Japanese historical resources from the perspective of interdisciplinary studies in the humanities and sciences using information infrastructure. It mainly aims to advance the state of research on historical studies in Japan. By classifying various cultural and research materials into time periods, regions, and research fields, analysis with an interdisciplinary scope can lead to more advanced sharing infrastructure and additional cooperative studies. To apply research results from different fields to digital networks effectively, project members were divided into three research groups: the unit for digital humanities, unit for cooperation in different academic fields, and unit for regional cooperation and education.

The unit for digital humanities (Figure 1) is mainly creating an environment for information infrastructure that enables access to resource information in Japan. In this group, academic knowledge is analyzed and accumulated to support access to resource information, especially based on research results from the other two groups. Focusing on Japanese historical resources as ‘materials’, the unit for cooperation in different fields. (Figure 1) is conducting interdisciplinary studies in the humanities and sciences and applying richer information taken from individual resources to various research fields. In cooperation with other institutes, the unit for regional cooperation and education (Figure 1) is aiming to create a model for

applying research results based on ISCRR to regional societies. Through the results of other two units, this group is exploring local histories and cultures and collaborating with institutes. It is also emphasizing outreach activities, including education programs of universities and museum exhibitions.

This project emphasizes collaboration with relevant local and international institutes. Cooperative studies with universities and the renovation of a digital network through collaboration with institutes will enable the backup of resource information in case of a disaster, thus supporting infrastructure. Moreover, this project is developing an English translation of available resource information and creating an environment that will enable access to resources in Japan. The goal is to create an environment that can enable access to resources in Japan. A backup of resource information, including nondisclosure of such information for various reasons, will further support and restore infrastructure in case of a disaster. By making use of the diverse information in the Knowledgebase of Historical Resources in Institutes (khirin), our new system, several local Japanese resources can be accessed through a digital dictionary of historical graphical names composed by the National Institutes for the Humanities (NIHU). We can observe historical resources in Japan, including famous and fine-grained local collections. This allows for access to Japanese historical resources and plants the seed for numerous studies in Japanese history. “khirin” is fully launched in May 2018. (Figure 2) (<https://khirin-ld.rekihaku.ac.jp/>)

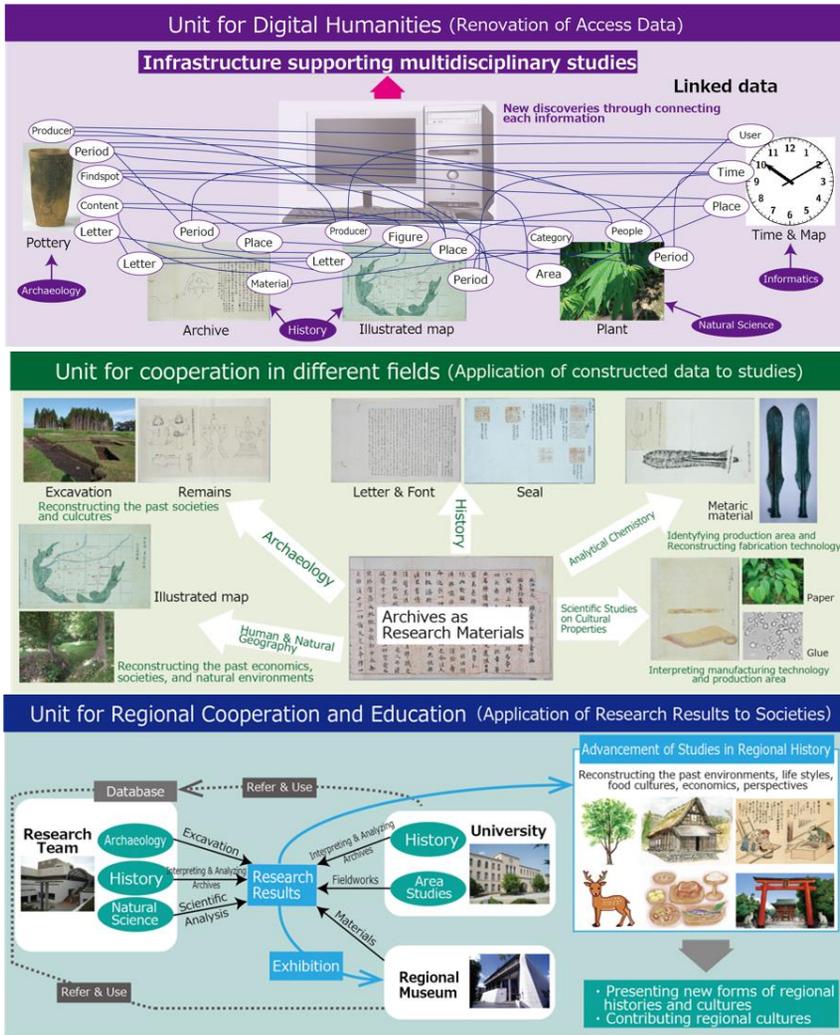


Figure 1: Unit of ISCRR

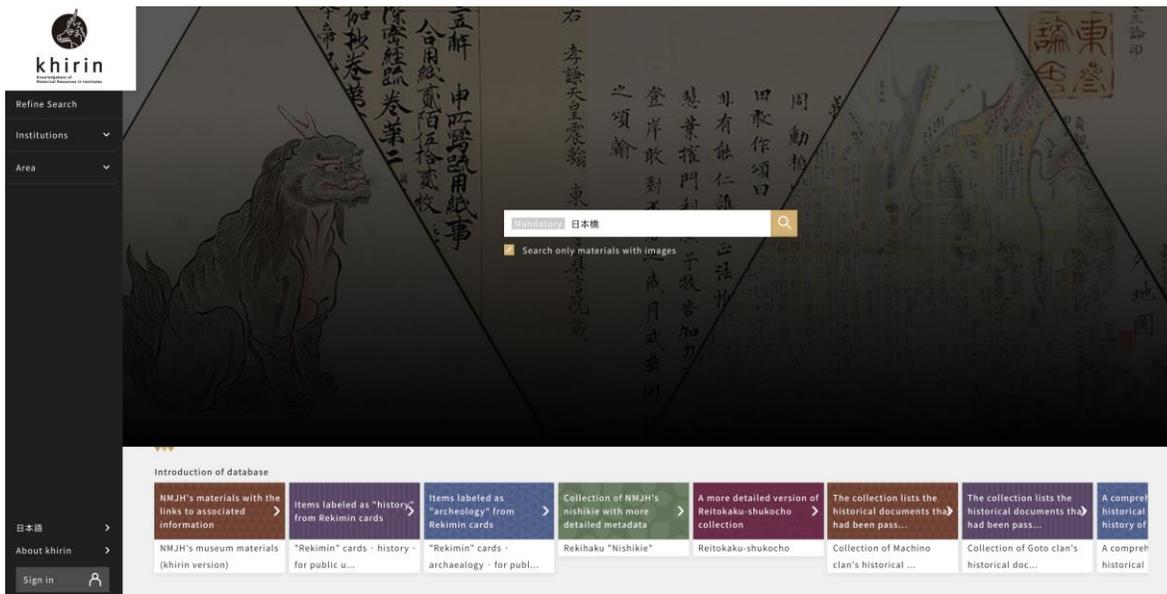


Figure 2: Top page of "khirin"

2. Rekishi Minzoku Chosa Card for Linked Data

The Rekishi minzoku chosa card (Rekimin cards) is a card catalogue of historical and folklore surveys conducted by the Agency for Cultural Affairs in Japan between 1972 and 1974, before the NMJH was established in 1983. Its categories are divided into history, archaeology, and folklore. The purpose of this system of card catalogue organization has not been clearly determined because there are few existing records. However, NMJH's current frameworks of history, archaeology, and folklore are similar to the Rekimin card categories, and after NMJH was established, the catalogue system remained. It is assumed that these kinds of surveys were employed in the establishment of NMJH. For developing the Rekimin card system, the Agency for Cultural Affairs in Japan contracted out prefectural cultural property staff members to conduct surveys in their areas, and the names of the staff members were recorded on all the cards. The official formats are slightly different for distinct categories of history, archaeology, and folklore, and their descriptions are followed by their academic features. The total number of cards is 65,000, 30% of which are in the history category, 20% in the archaeology category, and 50% in the folklore category.

Common items: Prefecture, prefecture number, year number, serial number

History category: Material name, holder (with address and telephone number), preserver (with address and telephone number), excavated location, period, creator, measurement, quality, form (overview, postscript, inscription), descendent, photo rubbing, note, designation

Archaeology category: Period, site (remain) name, responsible person, holder, site name, location, site outline, excavator, reference, remain condition, measurement, associated remain, note, designation

Folklore category: Standard name, type, local name, collected location, collected year and data, old holder, collected process, production location, production time, producer, possibility of collection, preparation method and material, used location, used time, user, using method, distribution and derivation, note, preserver (with address and telephone number). In addition to the above resource information in each category, monochrome photos (and some full-colour photos and drawings) are attached to the back (Figure 3), and each resource condition is shown by handwriting. Rekimin cards have the following four features.



Figure 3: Rekimin Card

First, these cards show snapshots indicating resource information in Japan, especially in the first half of the 1970s. Over 65,000 cards contain records of resource information; some of them show designated cultural properties, and others are private collections such as 'folklore materials'. This catalogue contains collections of museums and institutes as well as resources in local regions and provides a valuable example of nationwide surveys. However, the quality of surveys about resource information varies by prefecture, and the cards do not show information in a unified format. Second, all cards contain spatial information. Rekimin cards cover all of Japan (Figure 4), and the spatial information of historical resources is recorded. These contain not only 'good materials', such as important properties, but also local document archives and folklore tools. Third, all cards include temporal information, but their accuracy needs to be verified. Temporal information also varies by card category, and chronological methods tend to depend on the expertise of prefectural cultural property staff. Fourth, some of the resources were lost because of natural disasters and human factors, but the cards show their condition in the 1970s.

Based on these features, Rekimin cards show resources that have a definite historical value and provide basic information about historical resources in Japan. These cards were kept as a part of NMJH's published collection for many years.

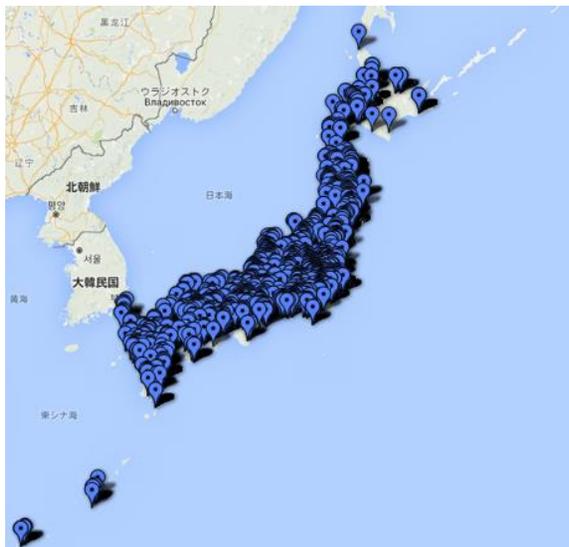


Figure 4: Plot of Rekimin Cards (Base Map: Google)

Publishing them is in line with the project mission ‘to activate resources in universities and museums’ in our ISCR. Therefore, they will be digitized and published through Linked Data. This project was conducted using RDF data from Rekimin cards, and SPARQL endpoints and prototypes were constructed using temporal and spatial information. To develop the actual prototype application, the project used search screens to collect information on museum collections, semantic searching, a model providing resource information on each collection, and possible applications of “khirin” using latitude/longitude information. The information above on the Rekimin Card is supplemented by the data introduced below.

a) Machino Family Documents (Machinoke monjo) in the collection of the Chiba University Library. This is an archive of ancient documents held for generations by the Machino family, the former headmen of the village of Kotehashichō in present-day Chiba City. In 1957, the then head of the Machino family, Mr. Machino Hisanori, placed them in the care of Chiba University. The archive includes approximately 700 documents that reveal the management of villages in the late Edo period and early years of the Meiji era. The information in these documents, in cooperation with Chiba University, has been converted to linked data and stored as IIIF images on document microfilm. Adding geographical information to this data will allow the insertion of data from the Rekimin Card.

b) This is a group of documents now in the possession of Chiba University, but they were originally the archive documents of the Hishida Family in Miyazaki City. After the head of the family moved to Chiba, the contents of a storehouse destroyed by the Great East Japan Earthquake were deposited for safekeeping by the Historical Document Network of Chiba. The inventory of this data has been converted into and prepared as linked data. As already mentioned, Rekimin cards are the data showing in 1970s. We cannot show the current information by using only the Rekimin cards. Putting other information such as the data of Chiba University can enrich the geographical information of Japanese historical resources. Furthermore, it can be used for rescuing historical and cultural resources. We will apply these information to the khirin continuously. Adding this type of information allowed not only Rekimin cards but also other types of document information to be represented on maps.

3. Utilization of Geographical Information to Historical Resources

For flexibility in retrieving resource information, our model allows users to search collections of museum and other institutes in cross-sections. This model is related to “khirin”, which allows users to search various databases at the same time in the ISCR. One possible advantage is the planned ability to browse information on both regional museum resources and Rekimin cards simultaneously. Search results provide not only links to a detailed screen but also numerous links. This is intended to help one gain one resource after another from the search results. The search results will show the http address, and ‘saving the search results’ will save only the address characters. ‘Searching for results by a researcher’ will show links to the websites of researchers and others.

Figure 5 shows a factual application model. Using the lat/long information of Rekimin cards, the model can display geographical maps and others. As we already mentioned, Rekimin cards contain geographical information from which it is easy to obtain spatial information. This could be helpful to survey past resource conditions. Making numerous Linked Data can allow users to globally and directly access information from historical resources in Japan. Users can examine Japanese history in greater detail and examine the cultural differences between localities. In the disaster-prone Japanese archipelago, this kind of information can be used to save resources damaged because of disasters such as earthquakes, tsunamis, and floods.

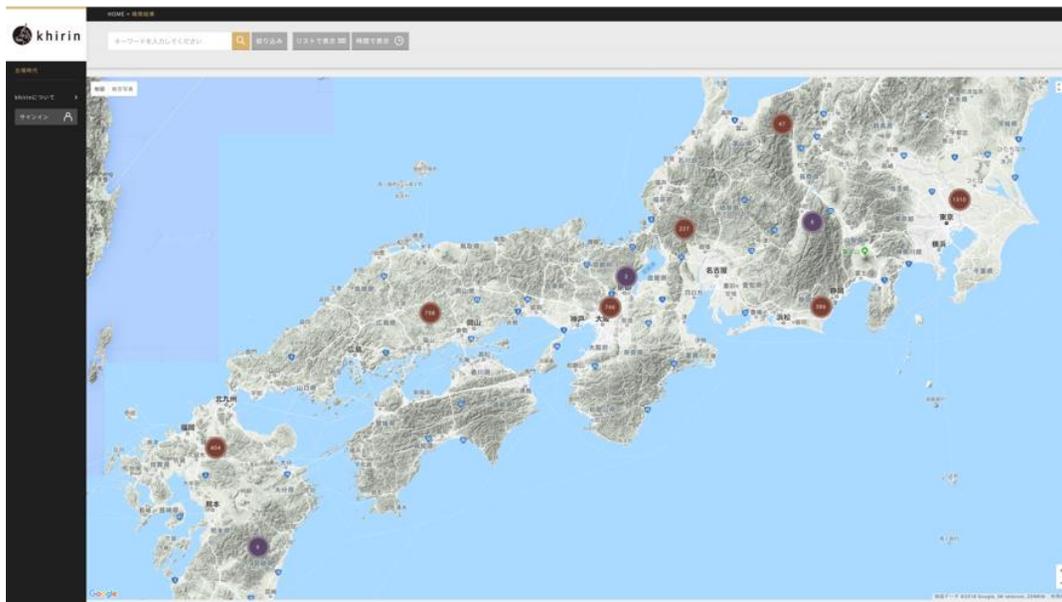


Figure 5: "khirin" search result in map

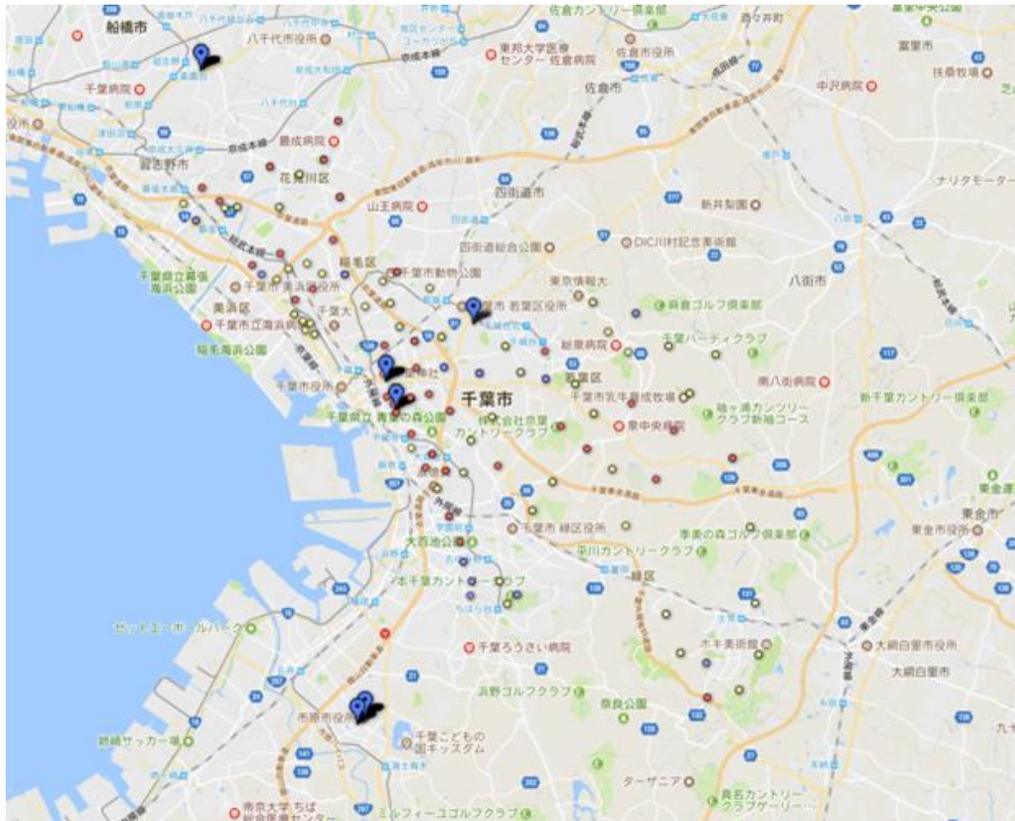


Figure 6: Rekimin Card and superimposes (Base Map: Google)

The "khirin" is divided into two layers. One is a public layer which is open for everyone, but the privately owned data is not exact. Another is a layer for people concerned such as resource possessors and researchers, and these members can see the

exact information of privately owned resources followed by authority. Also, we, NMJH keep more sensitive data outside of the "khirin". This is a layer of "dark archive", and it can be used for rescuing historical and cultural resources in case of disaster.

4. The Significance of Adding Geographical Information to Cultural Property Information

The following is an explanation of the significance of adding geographical information, in particular, to this database. First, it deepens the understanding of cultural properties in the region. Information on cultural properties in Japan is now broadly categorized under two systems: National Treasures, Important Cultural Properties, and so on designated by the nation (Government of Japan), and Important Cultural Properties designated by regional governments. Cultural properties designated by the nation, of course, include preeminent examples of Japanese art which attract broad interest. While masterpieces in this category clarify the overall history of Japan and are deeply appreciated for their artistic merits, they do not necessarily tell us very much about the regions where we reside. Historical documents include those which reveal the overall history of Japan and those which reveal in greater detail the histories of various regions of Japan.

However, it is not often easy to access this type of regional information. It is possible to access cultural institutions, such as libraries and museums, to obtain information, but it is difficult to determine to which region the information corresponds. For example, if a person only hears fragmentary pieces of information under old place names, it will be difficult for him to determine if this information accurately matches the facts about his native region. For example, Kotehashichō in Chiba City, for which this data was prepared, is a region with relatively extensive historical remains, but the fact that Chiba University possesses these documents is not necessarily known. Presumably, searching for this type of information and learning about it alongside geographical information will probably permit access to ancient documents about one's region during the Edo Period.

Similarly, although the Rekimin cards definitely cannot be described as masterpieces, information that reveals the history of a region exists under three categories: archeology, history, and folklore study. It is therefore presumed that applying this type of information to understand just what kinds of documents exist in a region can contribute to advancing our understanding of the history and culture of the region.

Next, I will talk about examples of rescuing historical documents following a large-scale natural disaster. In Japan, since the Awaji-Hanshin Earthquake, large-scale disasters have not only taken people's lives and livelihoods, but they have also destroyed the foundations of history and culture. After steps to deal with the loss of life and livelihoods have been completed, the remaining

challenge has been the restoration of the history and culture that can form the foundation necessary to establish the identity of and to unite the region. A large disaster also endangers historical documents themselves. When an ancient building has been destroyed, registered Important Cultural Properties are saved, but there is a common tendency for old documents, which are not designated as Important Cultural Properties, to be discarded without their value being recognized.

Activities have been undertaken to deal with the challenge of rescuing historical documents. Led by Kobe's "Shiryo-Network", in particular, these activities have been conducted for many years, but this challenge became a more urgent issue following the Great East Japan Earthquake. The Great East Japan Earthquake involved more than just earthquake destruction, as the tsunami completely washed away the region's historical document archives. With earthquake disasters, there is the collapse of buildings. The collapse of a building destroys the building while its historical documents remain undamaged. However, a tsunami also destroys historical documents. Furthermore, giant floods that are occurring more often in recent years have also been a major challenge to historical documents. As shown by the many cases where historical documents have been similarly washed away, this occurs somewhere in the Japanese Archipelago every year and demands a nationwide response.

A network (the Historical Document Network) centered on universities and museums throughout Japan has now been established to rescue historical documents. Led by this network, efforts are undertaken to rescue historical documents from disasters. Rescuing historical documents is a difficult task after a disaster has occurred, so it is vital to begin collecting information before the disaster occurs. In particular, clarifying information about the location of historical documents in normal times permits a rapid response after a disaster. In fact, following the Great East Japan Earthquake, there was a significant difference in the ease of rescuing documents in Miyagi Prefecture where information about the location of historical documents was already clarified to a certain degree and Iwate Prefecture where such clarification had been difficult. To clarify such information, it is extremely important to learn the location of the information.

As an earlier example concerning the information about historical remains in Japan, an organization called the Consortium for Earthquake-Damaged Cultural Heritage prepared GIS maps of the information on historical remains.

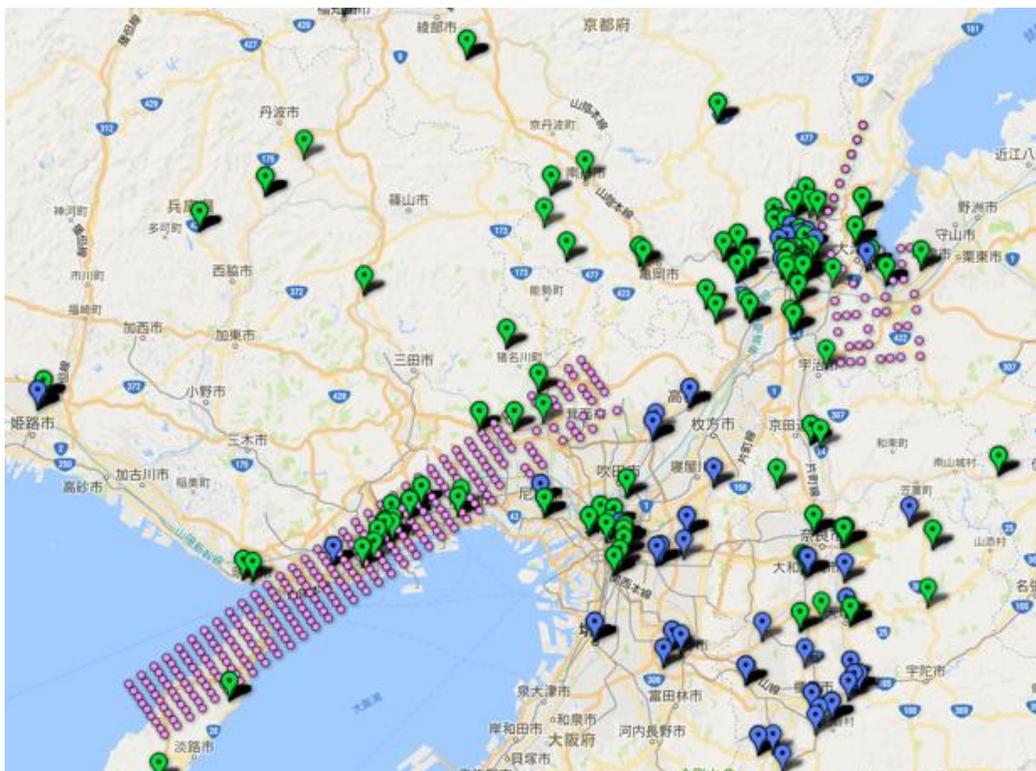


Figure 7: Rekimin Card and Faults (Base Map: Google)

It now seems to have suspended its operations, and it seems to be difficult to reuse these data. However, such activities should be evaluated in that they may be able to respond to large-scale disasters in the future. In Italy, a system intended to comprehensively clarify the location of cultural properties and disaster prevention information has been built and is now in operation throughout the country. Japan should build a future system with reference to systems such as the one operating in Italy.

Figure 6 plots cultural property information from the Rekimin cards and superimposes plotted regions at risk of large-scale disasters in Chiba City. Figure 7 also plots cultural property information from the Rekimin Cards and superimposes information about faults that are now known (the map's data is for the Nojima Fault, which is assumed to have caused the Kobe Earthquake, and the Hanaore Fault in Kyoto where there are many cultural properties). Superimposing geographical information onto locations with high chances of disasters, in this way, contributes to effectively clarifying priority locations for early response and advances countermeasures taken to prepare for disasters. Most of the current information is relatively old, but it is probably possible to clarify information about the location of historical documents in greater detail by using the Rekimin cards to update this information.

5. Future Challenges

This chapter describes challenges facing this system. One challenge is the question of the exhibition balance. Historical documents are kept not only in public organizations, such as museums, but are stored in temples, shrines, or in the homes of individuals. Widely exhibiting these documents would result in the public release of information that might be private assets, possibly causing problems related to privacy or theft. While it is necessary for this information to become more widely known to deepen our understanding of regional history and culture, to prevent the destruction of historical documents it is difficult to exhibit these for prolonged periods. The Rekimin cards are now divided into two ranks. The first are those that plot accurate information and can be perused only by concerned persons who have logged in, and the other plots latitudes and longitudes of documents possessed by individuals centered on cities, towns, and villages and can be perused by anyone. This achieves a balance between the two needs. The information on the Rekimin cards are relatively old, so it is handled in this way, but in the case of more recent information, regardless of its precision, its owners might refuse to exhibit information that contains personal content. It is therefore likely necessary to enact a privacy policy adapted to existing local conditions and at the same time to

demand an understanding of the clarification of information for disaster prevention purposes. One more issue is the challenge of updating the data. Cultural property information should essentially always be completely up to date. However, unlike Important Cultural Property, etc., unregistered historical documents can potentially be moved based on relevant information. It is possible to record the relocation of a museum or similar institutions, but in many ways, the action of clarifying the movement of individuals is difficult. An important future challenge is to find ways to overcome such difficulties continuously. As the information in Italy is mainly immovable cultural property, such problems are rarely encountered, but since they are nationally clarified, the Italian system probably cannot be imitated.

6. Future of Visualizing Historical Document Information

The above report has described cases of the visualization of historical document information as geographical information and their significance. History and culture cannot be detached from the time and place that they occur.

Effectively visualizing geographical information including the movement of the documents themselves will not only contribute greatly to their historical analysis, but also to their understanding and preservation. Efforts in this regard have barely begun in Japan. In the future, historical documents must be widely linked to geographical information and visualized as they are linked to information about historical place names.

References

- National Museum of Japanese History, 2016, Constructing Integrated Studies of Cultural and Research Resources, and Renovating Sharing Infrastructures of Research Resources in Japanese History and Culture, NIHU Magazine, 5. https://www.nihu.jp/ja/publication/nihu_magazine/005 (accessed 28 December 2017).
- Kamura, T. and Ohmukai, I., 2017, Linked Open Data in Humanities. *Journal of the Japanese Society for Artificial Intelligence*, Vol. 32(3): 401-407.