

# Local PR model by establishing open API for tourism information and related issues

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## Abstract

Recently, local revitalization has become an important issue. Activities to promote tourism, a comprehensive local force, are increasing most significantly. Because dissemination of tourism information is important in attracting tourists, open data is now gathering attention as a means of providing information. In this study, we propose a local PR model for providing tourism information in the form of open API, intended to disseminate tourism information through the content created using the open API. We converted the actual tourism information of Seto, Aichi Prefecture, into open data, in order to create various content using the resulting API; the proposed model was proven to be useful. We also reviewed some issues involved in providing open data, which were found during the process of creating the trial content.

## Keywords

open data, tourism information, open API, local revitalization, local PR

## 1. Introduction

Local revitalization is an important issue in Japan, and various activities are conducted for its revitalization. Many of these are driven by administrative authorities; we, the authors of this paper, are also involved in creating data broadcasting content promoting local informatization in cooperation with the city of Seto [Ura et al., 2008]. However, because a local community is composed of numerous elements, the coverage of broadcasting driven by an administrative authority has certain limits. Consequently, two alternate approaches have been proposed. First is “local power,” a movement to solve local issues driven mainly by local residents; we propose a support model using a web community for a demonstration test [Fukuyasu et al., 2012]. The second is “open data,” which allows for wide utilization of information held by the administrative authorities. Allowing use of this information by greater numbers of people will realize many possibilities that may not be included in the conventional content provided by the administrative authorities.

Tourism is sometimes called the “comprehensive power of local community,” meaning it plays an important role in local revitalization; therefore, many tourism promotion activities have been implemented. To attract tourists, it is important to disseminate tourism information. Open data is therefore suitable, since it enables distribution of information in various forms, and the number of actual local governments providing such information is increasing. However, to realize a wide variety of usage, some issues must be considered, such as amount and types of information to be provided and the ease of processing the data.

To that end, this study proposes a local PR model for dissemination of local tourism information through content created using tourism information provided as an open API. First, we create an open API for providing tourism information, based on the proposed PR model; we then create trial content using this open API. Through this trial, we demonstrate the variety of information that can be provided using the proposed model, and also review issues to be solved with respect to open data provision.

## 2. Current status of information disclosure of the local governments

Administrative authorities have access to various information on local communities, and they provide content using this information. Recently, open data has been gathering attention as a method for providing information.

### 2.1 Information distribution by administrative authorities and issues to be solved

Administrative authorities distribute variety of information for many purposes, e.g. notification of events and prevention of disasters/crimes. We also proposed a model of tourism promotion by the distribution of coupons, and are conducting demonstration test with the cooperation of Seto-city [Fukuyasu et al., 2011]. If an administrative authority creates content to distribute information, attention to certain publicness and fairness will be necessary due to the situation of the administrative authority. Accordingly, the content tends to be stereotypical. Moreover, as the content will be created by limited number of personnel, it is often difficult to create large amount of content.

### 2.2 Provision of open data

The concept of open data provision is becoming popular,

which promises to solve the aforementioned issues. Specifically, the concept involves provide data that can be freely and easily used by anyone, without any restrictions such as copyright. Many organizations already employing the open data system, especially administrative authorities with diverse information, are leading the dissemination of open data. After the disclosure of data.gov by the U.S. government in May 2009, some other countries had disclosed data distribution websites. In Japan, “Promotion of Open Data Strategies” [Ministry of Internal Affairs and Communications, 2012] was implemented in 2012 under the initiative of the Ministry of Internal Affairs and Communications, and the distribution website Open DATA METI Beta is in operation on a trial basis. In addition to the government, local administrative authorities have also employed the open data system. For example, Sabae in Fukui Prefecture discloses many data on the city official’s website, “Data City Sabae” [City of Sabae], allowing everyone to obtain information in API, XML, or similar formats. In this way, information that was conventionally distributed solely by administrative authorities can now be distributed by various individuals and companies; accordingly, increased information diffusion and development of new business can be expected.

### 2.3 Role of open data in the promotion of tourism

Some administrative governments apply restrictions on distribution of information. For example, the Tourism International Strategy Department of Aomori Prefecture distributes open data concerning prefectural tourism; users must apply to use the open data [Aomori Prefectural Government]. Tourism is expected to lead local revitalization by emphasizing local characteristics and making use of original local resources like nature, history, and culture [Kawatou, 2009]. Dissemination of information is important for tourism promotion, so open data, through which diverse information can easily be used, are suitable for distribution of tourism information. Open data systems have been introduced in both of the aforementioned cases, but some issues remain to be solved. Sabae, in Fukui Prefecture, distributes information on local tourism spots, but the amount of information on each shop is comparatively small, since so many data are handled. In the case of Aomori Prefecture, on the other hand, the content is rich because the range of information is limited, but because an application is required for use, not many people actually use the open data system.

## 3. Local PR model for establishing an open API for tourism information

Here, we propose a local PR model for disseminating tourism information through communication methods like word-of-mouth. We also create an open API to realize the model, and put it in practice to create actual content.

### 3.1 Proposal for local PR models

Word-of-mouth is a popular media used to communicate

information among people. This method is suitable for diffusing information within a local community, since people live relatively short distances from one another. However, the level of diffusion varies in word-of-mouth communication depending on individual distributor. Contributing factors include how well the distributor understands the attractiveness of the object, the distributor’s level of expressive power in communicating its attractiveness. To ensure thorough communication of information by word-of-mouth, effective distributors are essential. This necessitates making an easy-to-access environment available to many people, so that those with effective distributor abilities can access it.

To realize this easy-to-access environment, we use the framework of an open API accessible to various people. An API is an interface that provides certain functions in advance, eliminating the necessity for individual developers to program desired functions from zero. An API that discloses all information and allows free use is called an “open API.”

Various services already distribute tourism information APIs. Using Google, users can freely access map data through an open API. This has been used in various studies, and displays information on local culture and tourism on a map [Ozaki *et al.*, 2007]. Moreover, the government has also released a tourism information API using local government information [Ministry of Internal Affairs and Communications, 2015]. By providing tourism information through an open API, we can realize information distribution methods like word-of-mouth communication.

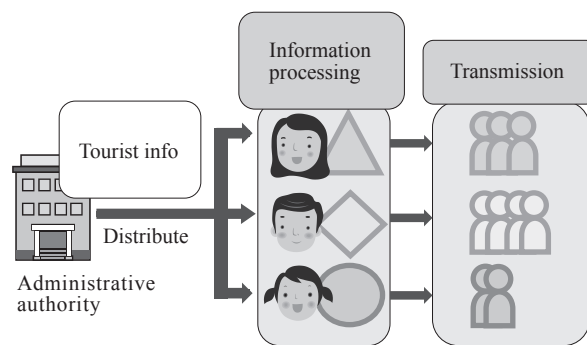


Figure 1: Local PR model

### 3.2 Creating an open API

Tourism information is provided in XML format. It is also provided in the form of an open API from which information can be dialogically accessed, facilitating easy use of data.

#### 3.2.1 Structure of information

Information on tourist spots includes necessary factors in deciding visits: the names, addresses, operating hours, and holidays of shops or organizations. The types of information may vary, depending on the category of the spot. For example, information necessary for restaurants includes menu lists, number of seats, and number of non-smoking seats; information neces-

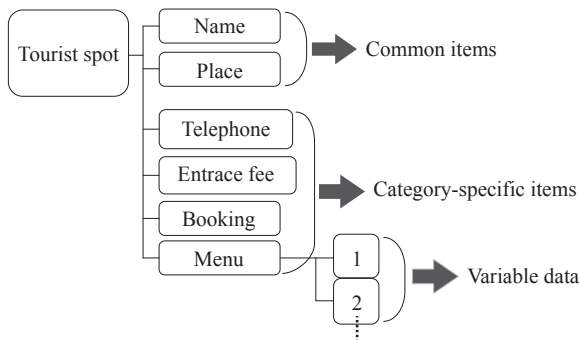


Figure 2: Example of XML structure of tourist spots

sary for tourist facilities includes entrance fees and description of events. We use XML because of its high flexibility in terms of structure and use. XML has a hierarchal structure, so variable information, like category-specific information or menus, as shown in Figure 2, may be treated as part of the overall business's information. In this study, we organize tourism information by each of the following: name of facility or shop, address, latitude/longitude, category, explanation, operating hours, shop holidays, photos, and parking/access information.

### 3.2.2 API specifications

The framework of the open API is shown in Figure 3; only designated data are retrieved by indicating keywords for the desired information. Inquiries are sent to MySQL, which retains data within the open API, and only data matching the keywords is retrieved. Information retrieved can be used freely in XML format. Keywords can be designated in various ways. Many search methods are possible. For example, a user can search for shops/facilities corresponding to the designated keywords, such as categories, names, and descriptions within the entirety of the data; or the user can search for shops/facilities located within a given number of kilometers from a given latitude and longitude.

### 3.3 Creation of trial content

Using the API shown in the preceding section, we create some trial content, each with different users and different usage situations.

#### 3.3.1 Tourism information content for digital signage

Here we demonstrate an example of content used to provide information through digital signage. A user stands before the digital signage and tweets with a hashtag on Twitter; information will then be displayed on the signage based on the words used in the user's tweet. The tweet information will be divided into words by means of morpheme analysis and converted into keywords. In this way, information containing those keywords can be accessed by the API. Figure 4 shows an example of the search result when the tweeted word was "unagi." In this way, a user tweets dialogically to access various tourist information using the digital signage.

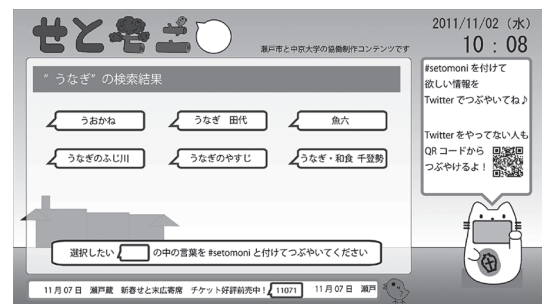


Figure 4: Digital signage content

#### 3.3.2 Photo posting sites

Figure 5 shows an example of a photo posting site. On this website, users can post photos taken in Seto, and can view and share photos of each spot. Since the open API extracts all the tourism spots, famous tourism spots are already registered, and users can choose their spot from a predetermined list when posting. If latitude/longitude is present in the photo file, tour-

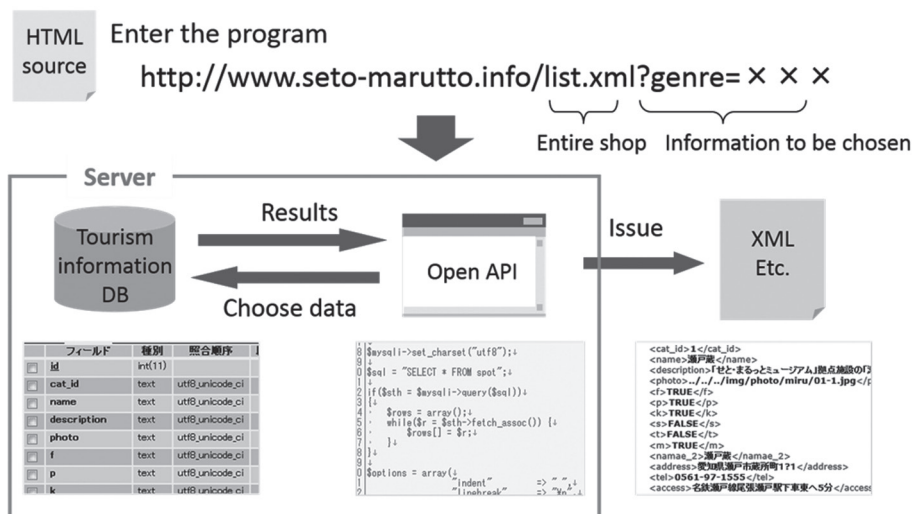


Figure 3: Obtaining information through an open API



Figure 5: Photo posting site

ism spots near that geographical position will be displayed as neighboring tourist spots. If the spot in the photo is not on the predetermined list, the user can choose the spot from the map and register it personally. This is an advantage for finding new tourism spots.

### 3.3.3 Gourmet Grand Prix

Figure 6 shows an example of the Gourmet Grand Prix using information from restaurants. “Seto Yakisoba” is a local food originating in Seto, and it has become popular since it was introduced in the BI Grand Prix in the Chubu area. We place focus on Seto Yakisoba and provide content that determines the grand prix food based on voting by visitors. Shops participating in the competition are selected by indicating “Seto Yakisoba” as the category in the open API. Since Seto Yakisoba is a Seto original food, this is expected to have an effect on PR for the city, and shops can use the information gained during the competition to gauge the users’ opinions.



Figure 6: Seto Yakisoba Gourmet Grand Prix

## 4. Consideration

Here we review the effects of promoting tourism by providing tourism information in an open API, based on the trial content we created. We also review the issues identified in the open API system through creation of our trial content.

### 4.1 Widening the scope of information with open data

As explained in the preceding section, we created trial content using the open API, focusing on different subjects and media, such as information distribution by highly public digital signage, user-participation photo sharing sites, and a gourmet grand prix competition. Each content had different target users, for example tourists, photo fans, and gastronomes. This shows that using an open API enables local PR using common data but targeting various types of people with different preferences. Moreover, as stated in section 2, this method allows for information provided in a ranking style, which in terms of fairness is difficult to realize through activity driven by an administrative authority; it also allows for disclosure of limited information, meaning that the range of potential content creation is widened.

We summarize the actual opinions of the Seto officials as follows:

- I can distribute various content without taking time and labor.
- I learned of new local appeal points I didn’t know of before.

An open API framework enables various types of people to create and provide diverse content. We believe that this will promote word-of-mouth dissemination of tourism information more than ever. Moreover, city officials can discover new charm.

### 4.2 Issues concerning the utilization of open data

As explained above, the effectiveness of open data use in tourism promotion has been proven. However, some issues concerning cooperation among organizations, for example the format of information, were found during our creation of the open API and trial content. The amount of information, one of the issues inherent in a local community, was also re-emphasized.

#### 4.2.1 Format of information

Almost all content using existing open data, including the trial content described in the preceding section, uses data provided by a single organization. However, taking tourism as an example, tourism spots surely exist not only in the district in question but also in the peripheral areas. In addition, some tourism factors are common among neighboring administrative governments, such as festivals and specialties. Thus, if it becomes possible to provide information concerning neighboring administrative governments or to categorize by common factors, the range of possible content creation will be greatly

widened.

To realize this, we must use open data from multiple administrative governments, but because each administrative government discloses its information in a self-determined form, the types and forms information provided differ with each administration. If the information from various administrations lacks unity and compatibility, available data will be limited to the greatest common factors in the administrative governments' data formats, and this will narrow the range of available content. Therefore, to further promote the use of open data, it is necessary to disclose information with the assumption that data may be used commonly with other data provided by other authorities.

In Japan, improvement of the common vocabulary base has begun [Information Technology Promotion Agency, 2013], and the official version was just disclosed in 2015. Also, the service called LinkData.org allows for easy creation of open data. Step by step, format unification is underway [LinkData.org., 2014].

#### Amount of information and update frequency

Data already distributed are essentially the same as those disclosed on the websites of respective administrative governments. As such, providing information through open data will not differ significantly from providing information on the existing websites [Kitchin, 2014]. In fact, large-scale data storage/search technology has already been developed [FUJITSU, 2013], enabling automatic storage of information on websites. Many other instances of Linked Open Data use can be seen in Japan and other countries [Heath and Bizer, 2011]. Under these circumstances, issues remaining to be solved in local content, namely amount of information and the frequency of updates, are also recognized in open data. The most important concern is how information should be collected for open data.

There have been many studies on the collection of local information, examples of which include the method for creating outing information using tweets on Twitter [Fukaya et al., 2011] and the method for supporting XML structuration [Kumagai et al., 2008]. These efforts aim to promote information provision by local residents. A framework that promotes local residents' participation in data collection, augmenting the data collection by administrative authorities, will be useful for constructing an open data system and solving these issues. For example, if the content of our photo posting site, described previously, were modified so that photos can be posted through a public domain, it would serve as a site for open data collection. It is important, for future dissemination of open data, to establish a data enrichment system wherein local residents add information to the open data provided by the administrative authorities.

## 5. Conclusion

This study proposes a local PR model for disseminating local tourism information via content created using tourism information provided as an open API. We created an actual open API using tourism information from Seto, Aichi Prefecture. Utilizing this API, we created three types of trial content tar-

geting various types of people. This trial content demonstrated various forms of information provision, and these models were confirmed to be useful. Additionally, we reviewed issues to be solved in providing open data, as well as some issues relating to inter-organization cooperation, for example information format. Finally, the amount of information, an issue inherent in local community, was re-emphasized.

In future, through operation of the content created in this study, we wish to proceed with verification of the content's actual effect on sightseeing promotion. We believe that it is necessary to formally organize the site of information distribution, for example through word-of-mouth communication among local residents. Information spread by word-of-mouth is regarded as relatively important when visiting tourism spots, so we will further study establishment of an open data system for this type of information and its secondary utilization. We will also work to disseminate open data, for example by utilizing open data in tourism events and setting opportunities for the public to connect with open data.

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