

Proposals and practices for promoting tourism by advancing open data through public-private partnerships

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Abstract

The tourism sector, which has suffered a decline in demand due to the COVID-19 pandemic, is expected to be revived with digital technology in the post-COVID society. This study aims to link event initiatives in Ichinomiya City (Aichi Prefecture) with local government-led initiatives to promote the use of local informatization and open data, create and publish event information data, and utilize such data. To this end, we created and implemented a proposal to develop tourism promotions through public-private partnerships between the City Hall and local companies. Through initiatives undertaken at the International Art Festival Aichi 2022 and the Hitsuji Summit Bishu, we were able to verify that our study's presented methodology was useful for promoting events by the city (government) and industry (private). We believe that this will help to develop the entire region not just with regard to the tourism field but also other fields. Based on the results of this study, we also discussed ways to improve the city's appeal and promote tourism.

Keywords

public-private partnership, open data promotion, local events, local informatization, tourism promotion

1. Introduction

Events that had to be suspended because of the COVID-19 pandemic have resumed under the concept of "living with COVID-19" and are starting to come back to life. Municipalities must recover their tourism sectors by balancing infection prevention with socioeconomic activity and developing communities for a post-COVID society. Japan has already identified three targets for its reforms to achieve a tourism-oriented nation: "autonomous tourism," "new types of tourism," and "sustainable tourism." Since the COVID-19 pandemic, "manageable tourism" has been added [Nippon Keidanren, 2022]. Revitalizing the tourism industry requires the promotion of digital transformation in tourism, including using public-private partnerships to develop data infrastructure to improve productivity and business efficiency using digital technology.

The Information Policy considers e-Administration and tourism as areas requiring top-priority IT Initiatives. The Declaration to be the World's Most Advanced IT Nation and the Basic Plan for the Advancement of Public and Private Sector Data Utilization, which form part of the government's IT strategy, clearly state this [Government CIO Portal, 2020]. It is important to release public interest data produced by the national government, public administration, and private sector and for private companies to cooperate in releasing their data, and there is a need to bolster public-private partnership-driven open data initiatives to promote the use of open data in the

community.

This study, which was conducted in Ichinomiya City (Aichi Prefecture), aimed to link the city's event initiatives with local government-led initiatives for promoting local informatization and open data, create and publishing event information data, and utilising such data. The aim is to develop these efforts into enhanced use of digital technology through public-private partnerships aimed at tourism promotion and the promotion of sightseeing tours through cooperation across the wider area.

2. Literature review

Tourism has attracted attention from various research fields, and many related initiatives have been started in informatics.

In a study on the promotion of tourism-related open data, Ogishima et al. conducted an open data trial and developed an application for promoting a tourism event organized by the local government in Higashi Ward, Nagoya City, Aichi Prefecture. Through these efforts, they proposed a method for implementing open data promotion in the daily work of municipal governments [Ogishima et al., 2016]. Furthermore, efforts were made in the same field to create a dataset based on citizens' knowledge and information about tourist attractions. These data were then to be used to further promote the appeal of these tourist sites [Urata et al., 2016; 2017].

Urata et al. developed a visualization tool for analyzing car license plates in Hida City (Gifu Prefecture) and analyzed tourist behavior based on the acquired data. In the future, they aim to promote data utilization and collaboration with other organizations by converting statistical processing data into open data [Urata et al., 2020].

Tu *et al.* collected data from Takahama City and Nisshin City in Aichi Prefecture and developed an anonymization processing support system for analyzing image data. They aimed to promote the open image data and improve operational efficiency in local governments [Tu *et al.*, 2021]. They also proposed a method for utilizing local image data by using image style transformation based on deep learning in Hida City, Gifu Prefecture. This method was intended to open image data, which is generally considered difficult to publish due to portrait rights and privacy issues, to the public and for utilization in tourism [Tu *et al.*, 2022].

Thus, various initiatives related to the promotion of open data by local governments and the revitalization of local tourism have been reported.

In Suzaka City (Nagano Prefecture), we have been working on citizen-participatory open data promotion and ICT/IoT utilization with an awareness of public-private collaboration in the region.

- (1) We proposed and conducted a workshop for citizens to promote open data. Through these efforts, we were able to confirm the usefulness of such workshops for promoting citizens' understanding of open data [Kanematsu *et al.*, 2016].
- (2) In our work in the field of zoos, we developed an application as well as some novelty goods to improve the appeal of zoos as tourist attractions. This project was linked to open data promotion measures promoted by the local government. These efforts proved effective in improving the appeal of zoos and revitalizing the city's tourism resources and promoting open data as well [Kanematsu *et al.*, 2018]. Furthermore, based on the open data promotion efforts conducted through manufacturing (Monozukuri), a perspective promoting public-private data-utilization in society has also been discussed [Endo *et al.*, 2018].
- (3) We linked the local government's efforts to promote citizen health to the promotion of open data. Health promotion tools were developed to link local resources to digital technology and data utilization. Through this project, we confirmed that this method is useful not only for promoting citizens' health but also for communicating the city's attractiveness to tourists through the synergistic effect of collaboration within the community [Kanematsu *et al.*, 2021].

Based on the knowledge gained from these efforts, this study attempted to implement a tourism promotion initiative through open data promotion in Ichinomiya City (Aichi Prefecture) in collaboration with the local government and industries.

3. Local industry and tourism

3.1 Local industries in Ichinomiya City

Ichinomiya City is in the Owari region of Aichi Prefecture. It is also known as "Bishu" because of its local textile manufacturing industry. Bishu refers to the western part of Owari, Aichi Prefecture, including Ichinomiya City, to the western

part of Seino, Gifu Prefecture. Blessed with the rich natural environment of the Kiso River basin, the area has developed into the largest woolen textile production area in Japan. In terms of scale, it accounts for about 80 % of the total domestic textile production. The region is globally renowned as one of the world's three major woolen textile production areas, along with Viera in Italy and Huddersfield in England.

Making fabrics in Bishu is divided into several steps, including spinning, twining, dyeing, weaving, knitting, and finishing. The specialized knowledge and techniques accumulated and cultivated there have been passed down over the years. The high-quality textiles produced in Bishu are highly trusted by top brands both in Japan and abroad. Ichinomiya City takes pride in its local resources.

3.2 Tourist events and information sharing

Ichinomiya City hosts a variety of events over the year. The Ichinomiya Tanabata Festival is one of the three most popular Tanabata festivals in Japan. It receives many tourists every year. The "JAPAN YARN FAIR" and "Exhibition THE Bishu" are two events unique to Ichinomiya City, which emphasize its specialization in textiles. The events are packed with people in apparel-related industries both in Japan and abroad. The Ichinomiya City Tourism Association, under the jurisdiction of the City Hall, acts as the point of contact for information on events held in these cities. Alongside the Ichinomiya City Tourism website, *ichinomiyaNAVI*, the city also uses multiple social media channels—Facebook, Instagram, and YouTube—to share information.

Several information dissemination channels are also run by local textile companies and citizen groups specializing in Bishu fabrics. The website and social media channels provide information on textile-related events held by companies and civic groups in the Bishu area.

4. Local informatization in Ichinomiya City

4.1 Publication of open data

Since 2016, Ichinomiya City has been working on converting information held by the city into open data on the Ichinomiya City Open Data Catalog site. Publicly available data includes regularly compiled statistical information such as population and municipal tax data, information on facilities such as parks and nursery schools, and information on cultural assets such as buildings and paintings.

In particular, Ichinomiya City has been working on a joint research project with Nagoya University to release bus information and photo data to utilize that data. Information on buses operating in the city, such as operation routes, timetables, and bus stop locations, is available as General Transit Feed Specification (GTFS) data, which is a standard bus data format. With the release of this data format, it became possible to display city bus information using the Google Maps route search function [Yagami *et al.*, 2018]. Photo data are posted on the city's open data catalog site and on OpenPhoto, a service operated

by INFO LOUNGE, Inc. This has enabled cross-searches with photo data published by other municipalities [Suzuki et al., 2020].

4.2 Intra-regional cooperation initiatives

The authors have worked to promote open data and use ICT/IoT using local resources through intra-regional collaboration [Kanematsu et al., 2018; 2021]. Based on these findings, we held two types of craft (Monozukuri) workshops for citizens in Ichinomiya City and worked to promote citizen-participatory open data through intra-community collaboration.

(1) Creating open data from digital illustrations and its use

A workshop was held for participants to experience converting their original illustrations drawn using tablet devices into open data. The participants also experienced using published data through digital fabrication (Figure 1). Using a laser cutting machine and UV printer at a manufacturing (Monozukuri) facility in the city, the participants received technical guidance from the facility staff and a web/DTP designer living in the city. Through this experience of Monozukuri the workshop participants learned practical applications for public data published as open data.

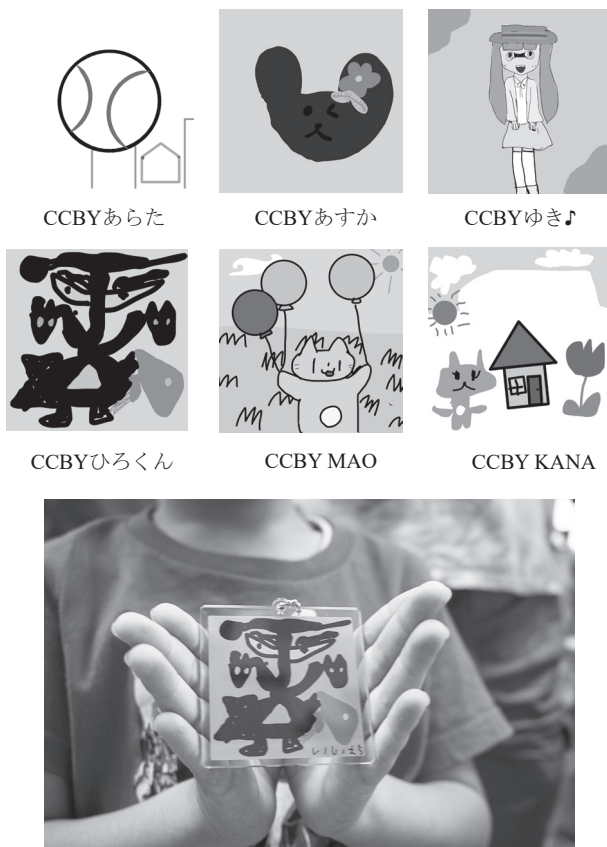


Figure 1: Participants' illustrations converted to open data (top), works created using open data (bottom)

(2) Creating open data from Monozukuri data and its use

Workshops were held using Monozukuri-related open data

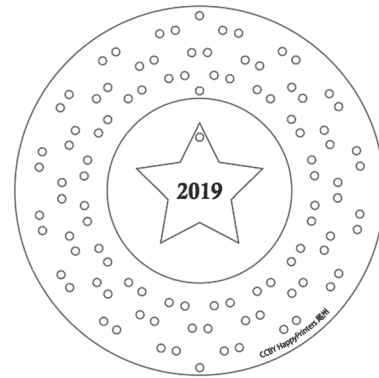


Figure 2: Creating open data from parts data (top), Participants' works (bottom)

and the locally produced Bishu yarn. The city's Monozukuri facilities created the data and converted it into open data ahead of time: This data was passed to a laser processing machine to create parts for use. Participants gained knowledge by listening to explanations about local industries and open data at the beginning of the workshop before starting work on their pieces (Figure 2). By experiencing Monozukuri workshop participants were given the opportunity to learn about the city's local industries and open data initiatives.

These efforts were planned by OpenFactory, which operates a Monozukuri facility, and a web/DTP designer living in Ichinomiya City in cooperation with the authors. Since the workshops are related to the local industry and education, the authors also collaborated with the Ichinomiya Local Industry Fashion Design Center, the Ichinomiya City Board of Education, and Re-TAiL Co. Ltd.

Local people, including local businesses and experts living in the city, collaborated with the city-led open data promotion measures, and workshop participants experienced converting to open data and its utilization, leading to public-private partnership initiatives.

5. Promoting tourism by promoting open data

5.1 Proposals for promoting open data and data utilization through public-private partnerships

We believe the following elements are needed to link Ichi-

nomiya City’s events initiatives to the promotion of tourism through the promotion of open data and its use by public-private partnerships.

- (1) Publishing data with consideration for promoting its use
As described in 4.1, Ichinomiya City has been working to release various public data. Adding innovations to encourage companies and citizens to utilize the data will be necessary in the future. To this end, municipalities are required to start initiatives based on the idea of open data by design [Government CIO Portal, 2019], and efforts are necessary for starting with the assumption of open data from the planning and design stages of events. Discussions are based on the premise of utilization, which leads to the release of data that are easier for users to use.
- (2) Examples of use methods
It is necessary for the city to first take the initiative in utilizing event data released as open data and to set an example. If the city (public sector) provides examples of the use of open data, it will be easier for companies and citizens (the private sector) to use the data by referring to those examples. It will also promote an understanding of the city’s policies.
- (3) Consideration of versatility
When a city (public sector) implements an initiative using open data, it is necessary to choose versatile and low-cost methods, out of consideration that companies and citizens (the private sector) will use it as a reference. Lowering the hurdles to using open data and making it easier to follow the example of others can be expected to create stronger public-private partnership efforts.

As this study demonstrates, we believe that by promoting events initiatives in the city incorporating these elements, initiatives promoting open data in the community and the use of data in the tourism field will lead to the strengthening of messages communicating the charm of local resources through co-operation between the public and private sectors, and this can be expected to contribute to the promotion of tourism. Specific details are described in the next section.

5.2 Development and use of the International Art Festival Aichi 2022 Ichinomiya City digital venue map website

Every three years, Aichi Prefecture hosts one of the largest art festivals in Japan. The International Arts Festival Aichi 2022 is an international arts festival that presents innovative art spanning genres, including contemporary art, performing arts, and learning programs. It was held over 73 days between July 30 and October 10, 2022, at four venues in Aichi Prefecture: Aichi Arts Center, Ichinomiya City, Tokoname City, and Arimatsu Ward, Nagoya City.

The Ichinomiya City venue features 42 event spots that are scattered throughout the city. Therefore, it was difficult to guide visitors from outside the city or prefecture who were

unfamiliar with the area to each venue by using only the paper map attached to the pamphlet. The authors and the event-related departments (Digital Promotion Office of the Ichinomiya City General Affairs Department, and the Museum Management Department of the Ichinomiya City Regeneration Department) collaborated to develop the “Ichinomiya City Digital Map Site.” Ichinomiya City actively utilizes open data, such as event data released in conjunction with the International Art Festival Aichi 2022; furthermore, alongside the collaboration between the government and academia, the project was undertaken with advice from the industry.

5.2.1 Publication of event data

In publishing Ichinomiya City venue event data as open data, we first selected from the Ichinomiya City venue data held by the city data that could be published. Next, a dataset was created based on the recommended dataset published by the Digital Agency [Digital Agency, 2021] (Figure 3). This dataset contained basic event data such as venue number, event name, location information, and the date and time of the event. For items not included in the recommended data set, the authors and city hall staff checked between them to ensure that the data format was suitable for machine-reading and that the data could be easily used by third parties once publicly available.

会場番号	イベント名	会場住所	開催日時
22001	国際芸術祭Aichi2022 一般公開1	国際芸術祭Aichi2022 一般公開1	2022年7月30日
22002	国際芸術祭Aichi2022 一般公開2	国際芸術祭Aichi2022 一般公開2	2022年7月31日
22003	国際芸術祭Aichi2022 一般公開3	国際芸術祭Aichi2022 一般公開3	2022年8月1日
22004	国際芸術祭Aichi2022 一般公開4	国際芸術祭Aichi2022 一般公開4	2022年8月2日
22005	国際芸術祭Aichi2022 一般公開5	国際芸術祭Aichi2022 一般公開5	2022年8月3日
22006	国際芸術祭Aichi2022 一般公開6	国際芸術祭Aichi2022 一般公開6	2022年8月4日
22007	国際芸術祭Aichi2022 一般公開7	国際芸術祭Aichi2022 一般公開7	2022年8月5日
22008	国際芸術祭Aichi2022 一般公開8	国際芸術祭Aichi2022 一般公開8	2022年8月6日
22009	国際芸術祭Aichi2022 一般公開9	国際芸術祭Aichi2022 一般公開9	2022年8月7日
22010	国際芸術祭Aichi2022 一般公開10	国際芸術祭Aichi2022 一般公開10	2022年8月8日
22011	国際芸術祭Aichi2022 一般公開11	国際芸術祭Aichi2022 一般公開11	2022年8月9日
22012	国際芸術祭Aichi2022 一般公開12	国際芸術祭Aichi2022 一般公開12	2022年8月10日
22013	国際芸術祭Aichi2022 一般公開13	国際芸術祭Aichi2022 一般公開13	2022年8月11日
22014	国際芸術祭Aichi2022 一般公開14	国際芸術祭Aichi2022 一般公開14	2022年8月12日
22015	国際芸術祭Aichi2022 一般公開15	国際芸術祭Aichi2022 一般公開15	2022年8月13日
22016	国際芸術祭Aichi2022 一般公開16	国際芸術祭Aichi2022 一般公開16	2022年8月14日
22017	国際芸術祭Aichi2022 一般公開17	国際芸術祭Aichi2022 一般公開17	2022年8月15日
22018	国際芸術祭Aichi2022 一般公開18	国際芸術祭Aichi2022 一般公開18	2022年8月16日
22019	国際芸術祭Aichi2022 一般公開19	国際芸術祭Aichi2022 一般公開19	2022年8月17日
22020	国際芸術祭Aichi2022 一般公開20	国際芸術祭Aichi2022 一般公開20	2022年8月18日
22021	国際芸術祭Aichi2022 一般公開21	国際芸術祭Aichi2022 一般公開21	2022年8月19日
22022	国際芸術祭Aichi2022 一般公開22	国際芸術祭Aichi2022 一般公開22	2022年8月20日
22023	国際芸術祭Aichi2022 一般公開23	国際芸術祭Aichi2022 一般公開23	2022年8月21日
22024	国際芸術祭Aichi2022 一般公開24	国際芸術祭Aichi2022 一般公開24	2022年8月22日
22025	国際芸術祭Aichi2022 一般公開25	国際芸術祭Aichi2022 一般公開25	2022年8月23日
22026	国際芸術祭Aichi2022 一般公開26	国際芸術祭Aichi2022 一般公開26	2022年8月24日
22027	国際芸術祭Aichi2022 一般公開27	国際芸術祭Aichi2022 一般公開27	2022年8月25日
22028	国際芸術祭Aichi2022 一般公開28	国際芸術祭Aichi2022 一般公開28	2022年8月26日
22029	国際芸術祭Aichi2022 一般公開29	国際芸術祭Aichi2022 一般公開29	2022年8月27日
22030	国際芸術祭Aichi2022 一般公開30	国際芸術祭Aichi2022 一般公開30	2022年8月28日
22031	国際芸術祭Aichi2022 一般公開31	国際芸術祭Aichi2022 一般公開31	2022年8月29日
22032	国際芸術祭Aichi2022 一般公開32	国際芸術祭Aichi2022 一般公開32	2022年8月30日
22033	国際芸術祭Aichi2022 一般公開33	国際芸術祭Aichi2022 一般公開33	2022年8月31日
22034	国際芸術祭Aichi2022 一般公開34	国際芸術祭Aichi2022 一般公開34	2022年9月1日
22035	国際芸術祭Aichi2022 一般公開35	国際芸術祭Aichi2022 一般公開35	2022年9月2日
22036	国際芸術祭Aichi2022 一般公開36	国際芸術祭Aichi2022 一般公開36	2022年9月3日
22037	国際芸術祭Aichi2022 一般公開37	国際芸術祭Aichi2022 一般公開37	2022年9月4日
22038	国際芸術祭Aichi2022 一般公開38	国際芸術祭Aichi2022 一般公開38	2022年9月5日
22039	国際芸術祭Aichi2022 一般公開39	国際芸術祭Aichi2022 一般公開39	2022年9月6日
22040	国際芸術祭Aichi2022 一般公開40	国際芸術祭Aichi2022 一般公開40	2022年9月7日
22041	国際芸術祭Aichi2022 一般公開41	国際芸術祭Aichi2022 一般公開41	2022年9月8日
22042	国際芸術祭Aichi2022 一般公開42	国際芸術祭Aichi2022 一般公開42	2022年9月9日

Figure 3: An excerpt from the dataset

The dataset was uploaded to the “Open Data Catalog Site [Ichinomiya City, 2016]” managed and operated by the city, and to LinkData [LinkData.org, 2012], a service managed and operated by an external company that supports the use of open data, and released as open data. LinkData can be used free of charge by anyone and provides an API for application developers. Therefore, it is expected to lead to the increased utilization of publicly available data (Figure 4).

5.2.2 Development and data management

Using the published event data, we developed a digital map website for Ichinomiya City venues. The authors development of this system because it required technical knowledge and skills. The city hall oversaw other policy decisions. The city hall staff and the International Art Festival Aichi 2022 secretariat conducted the final checks on the completed website. The city hall’s initiative thus enhanced local governments’ data literacy. It is also expected to benefit website users by promot-

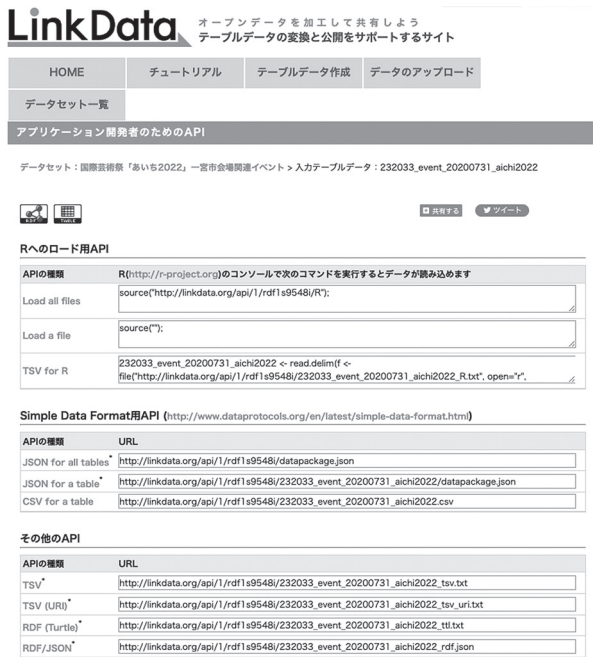


Figure 4: API page for acquiring table data

ing the improvement and enhancement of website content. Although the authors development of this system, we expect that local companies and citizens will be responsible for its development in the future. The goal is to make this an independent initiative. The development of the site took approximately three months. Visual Studio Code was used as the development environment. The development program uses HTML and CSS to display and style text on the site and uses JavaScript to pull data from LinkData and display it on the website.

Unlike ordinary websites where text and images to be displayed are written directly into the program code, this digital map website uses an application programming interface (API) to directly access the open data uploaded by Ichinomiya City to LinkData, with the program written to display text and images from that open data. By using this method, the data management and updating of the site can be handled only by rewriting the Excel data files already uploaded to LinkData by Ichinomiya City. Anyone who can operate Excel will thus be able to

handle the website data without any programming knowledge. When the site is updated, the open data will also be updated to the latest version, thus reducing the burden on the site administrator (Figure 5).

5.2.3 Structure of the digital map website

The digital map website developed consists of three pages: digital map, venue access, and Bishu Fabric.

(1) Digital map

All 42 venues in the city are marked with pins on a map. The pins are color-coded to illustrate whether they are the main or sub-venues of Aichi 2022. Furthermore, as a default

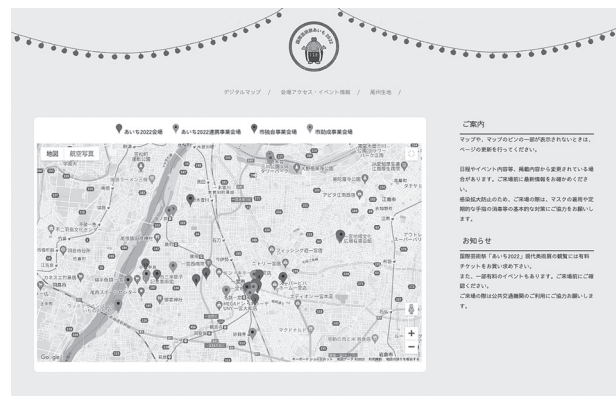


Figure 6: Digital map of Ichinomiya City venues (top), detailed venue information (bottom)

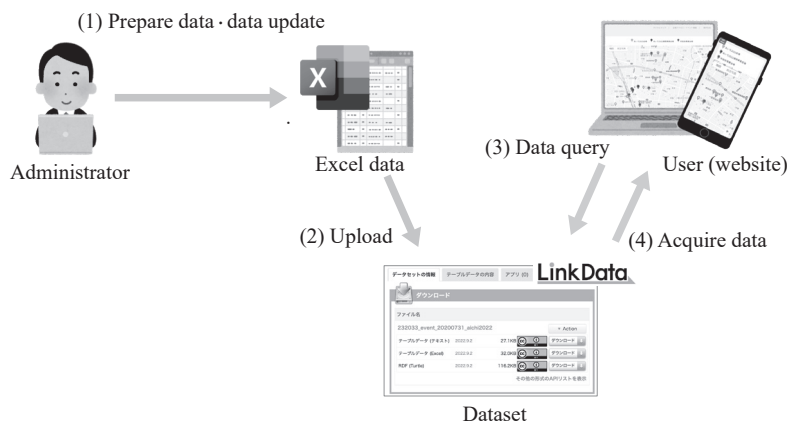


Figure 5: Managing and updating site data

setting, when the site is opened, the locations of all the venues in the city can be viewed on a map. Users can check the location of each venue by zooming in and out on the screen and tapping the pins to obtain detailed information about each venue (Figure 6).

(2) Venue access

All venues can be displayed as a list. In addition to reviewing information such as the address, business hours, and regular holidays of each venue, visitors can use the Google Maps route search function embedded in the page to check how to access the venue and obtain directions from their current location (Figure 7).



Figure 7: Venue access information

(3) Bishu fabric and city sightseeing

A page introducing Ichinomiya City’s local industries and sightseeing spots was also prepared for visitors (Figure 8). The site provides information on the process of producing Bishu fabric, of which Ichinomiya City (Bishu area) is proud to be a world-class producer, photos of yarns and fabrics, and information on sightseeing around the city. While the main part of this site is a digital map of the Ichinomiya venues of the International Art Festival Aichi 2022, some sub-pages describe the charms of local resources in the area in the hope that visitors to the International Art Festival Aichi 2022 will be inspired to visit Ichinomiya City again in the future.

In creating this page, the Ichinomiya Local Industry Fashion Design Center and local business stakeholders provided photo data and suggestions for the local industry section, while the Ichinomiya City Tourism Association provided advice for the city’s sightseeing sections. For tourism-related photos, we actively used data published as open photo data on the Ichinomiya City Photo Catalog [OpenPhoto, 2021] by the Public Relations Department of the Ichinomiya City Policy Office.

5.2.4 Using the digital map websites

The developed Digital Map Website was launched on August 24, 2022, on the city hall website. Furthermore, posters were put up in several related facilities in Ichinomiya City to inform venue visitors of the access points. QR codes and NFC



Figure 8: Highlighting local industries (top), information on sightseeing around the city (bottom)

tags were attached to the posters to promote the use of ICT/IoT. Visitors can access and use the Digital Map website on the spot by holding up their smartphones or tablet devices to the posters (Figure 9).

5.3 Development and use of the Hitsuji Summit Bishu digital map website

Hitsuji Summit Bishu is an open factory event held throughout the Bishu area (Ichinomiya City, Aichi Prefecture; Hashima City, Gifu Prefecture; and Tsushima City, Aichi Prefecture). Held on October 29 and 30, 2022, the two-day event featured over 70 events at 47 sheep-related factories and restaurants. Because the venues are scattered throughout the city, the author and the Hitsuji Summit Bishu Executive Committee collaborated with industry and academia to develop a digital map using the same mechanics as the “International Art Festival Aichi 2022 Ichinomiya City Venue Digital Map Website.” Taking the method of publishing open event data and examples of its use presented by the city (public sector) as a reference, this digital map uses open event data published by the Hitsuji Summit Bishu Executive Committee in connection with the event.

5.3.1 Publishing event data

To publish event data, we first selected data that could be made available to the public from among the data managed



Figure 9: The posters (top), displaying the posters (bottom)

by the Hitsuji Summit Bishu Executive Committee. Next, we created a dataset for the Hitsuji Summit Bishu based on the dataset released by Ichinomiya City during the International Art Festival Aichi 2022. In addition to basic event data, this dataset includes highly specific data, such as a list of companies related to local industries in the Bishu area and their business activities. As with the city's digital map data, this dataset was then uploaded to LinkData and released as open data. The Bishu area includes Ichinomiya City in Aichi Prefecture, Tsushima City, and Hashima City in Gifu Prefecture. This dataset was also related to wide-area cooperation.

5.3.2 Development and data management

A Digital Map website was developed for use at the Hitsuji Summit Bishu. The authors development of this system because the method is the same as the previous site. The Hitsuji Summit Bishu Executive Committee oversaw the other aspects of the site and conducted the final checks on the public site when it was launched. As was the case with Aichi 2022, this project is expected to raise data use-related literacy. Web content development should benefit the companies involved in the event as well as the content users. The development of the site took approximately two months. Visual Studio Code was used as the development environment, and the same method as that used for the Digital Map of the International Art Festival Aichi 2022 Ichinomiya City venue was utilized. The text and images on the site were displayed using an Application Programming

Interface (API) that could directly access data published on LinkData by the Hitsuji Summit Bishu Executive Committee. This method can also reduce the burden on site administrators at events where companies and citizens (private citizens) are the main actors.

5.3.3 Structure of the digital map website

The Hitsuji Summit Bishu Digital Map website we developed consisted of two pages: a digital map and venue access and event information.

(1) Digital Map

The venues were classified into the following categories: textile, food and beverages, other, and prize exchange. They were displayed as sheep icons on the map. A check box feature allowed users to narrow down their searches. Tapping the sheep icon displays the name and address of the venue and jumps to the appropriate page on the official Hitsuji Summit Bishu website for other details. Tsushima city (Aichi Prefecture) is located significantly further away from Ichinomiya City (Aichi Prefecture) and Hashima City (Gifu Prefecture). Therefore, the map was divided into "Ichinomiya and Hashima" and "Tsushima." Users were able to click a button to switch the maps (Figure 10).



Figure 10: Hitsuji Summit Bishu digital map (top), detailed venue information (bottom)

(2) Venue access and event information

All venues can be illustrated as a list. In addition to checking the address, event details, business hours, and partici-



Figure 11: Venue access information

ation fees for each venue, users can use the Google Maps route search embedded in the page to find a route from their current location to their destination (Figure 11).

5.3.4 Using the digital map site

The developed Digital Map was launched on October 27, 2022, on the official website of the Hitsuji Summit Bishu. The access point was made public to encourage visitors to make use of the map (Figure 12). The event venues are separate from one another, and many visitors check the information of each venue on the official website and make a tour plan before visiting the venue. For this reason, the map page can be accessed directly by clicking the URL posted on the official website.



Figure 12: Digital map information page

5.4 Partnerships with print media

The information of the two websites developed in this study was consistent with the information in print media distributed at the event and the venue number. Visitors can compare the information in the print media and the website while visiting the event sites. In addition, as many visitors are expected to access the sites from smartphones and tablets, both sites incorporated responsive web design (Figure 13). The maps were designed so that visitors from outside the city or prefecture unfamiliar with



Figure 13: The International Art Festival Aichi 2022 Ichinomiya City digital venue map website (left), the Hitsuji Summit Bishu digital map website (right)

the area could enjoy the event by touring each venue, using the advantages of paper and digital maps.

6. Discussion

In this study, we proposed and implemented elements necessary to link event initiatives in Ichinomiya City to tourism promotion by promoting open data and data utilization in public-private partnerships. First, the city (public sector) worked on releasing event data and the use of that data. Local companies (private sector) then used these examples as a reference for horizontal development using the same methods. This approach resulted in the release of event data from the city's public and private sectors, assuming that the data would be used. In addition, the event data disclosed by local companies (private sector) were highly unique data on the local industry in the Bishu region, including Ichinomiya City. The results also showed that using these data is useful for reviving events, raising the city's appeal, and bolstering open data initiatives.

The Digital Map Site for the Ichinomiya City venue of the International Art Festival Aichi 2022 received approximately 5,000 views, and the digital map site for the Hitsuji Summit Bishu received approximately 700 views. Regarding the convenience and satisfaction of each site, users made comments such as "the digital map function is useful when visiting the venues" and "it is useful to get a comprehensive look of the sightseeing information of the city." Event staff members made comments such as "It is difficult to explain routes to venues to visitors unfamiliar with the area. The digital map is useful because it helps them navigate the route from their current location to their destination" and "the information on local industries and sightseeing is useful when guiding visitors." On the other hand, we also received comments such as "Multilingual support for visitors from overseas would be useful" and "It

would be helpful if it could display recommended tour routes.” The results of this study confirmed future issues and points requiring improvement.

Considering the results of this study, we will discuss methods to further increase the region’s appeal with respect to promoting tourism.

(1) Creating case studies for public-private partnerships

In this study, the release and use of event data from the International Art Festival Aichi 2022 Ichinomiya City served as a case study on the use of open data by the city and led to the horizontal development of events held by the private sector. Going forward, the city (public sector) should continue to release data with consideration for its use and actively increase the number of examples of its use, as this will lead to horizontal development in the private sector. As in this case, collaboration and cooperation between the various departments within government are also essential. Local resources are diverse, and consequently, we believe that cross-departmental efforts will increase the diversity of data use examples, which will aid in increasing the city’s appeal.

(2) Bolster initiatives through intra-community partnerships

The International Art Festival Aichi 2022 Digital Map website was a government-academia partnership, while the Hitsuji Summit Bishu Digital Map website was an industry-academic partnership in which the authors, city hall, and local companies played a central role. Going forward, it is necessary to expand the circle of participants to include not only city hall and local businesses, but also municipal facilities, local schools, and interested citizens. Participants with diverse perspectives will become the city’s overall strength, and the combined efforts of the public and private sectors will lead to the further development of the region.

(3) Increasing open data on local resources

Active use of digital technology will be needed in anticipation of a post-COVID-19 society, and data on local resources highlighting the region’s characteristics will be essential, particularly for developing tourist-oriented content. In this study, highly unique data on local industries in the Bishu region, including Ichinomiya City, were made public, leading to web content development and use. To further boost regional tourism going forward, it will be necessary to publish data unique to the region in question and actively use this data.

Information on the development methods used in this study is available on the Knowledge Connector [LinkData.org, 2012], a website for sharing ideas and results related to the use of open data. In terms of versatility, it is important to proactively publish information that is useful for horizontal development to other municipalities. It is also necessary to build cooperative relationships with other municipalities in the neighborhood to build wide-area cooperation. It is also important to exchange

information regularly to learn from each other and to build relationships that allow for obtaining direct advice when necessary.

7. Conclusion

In this study, taking Ichinomiya City in Aichi Prefecture as our field of study, we proposed and implemented a plan to consolidate, publish and use event information data about the city’s event initiatives through the local government’s promotion of local informatization and open data, and to develop tourism promotion through a partnership between the public and private sector. Through these two event initiatives, we confirmed that if the city (public sector) makes datasets public, actively incorporates the data into the city’s initiatives, and presents them as examples of data use, companies (private sector) will be able to move forward with similar initiatives by referencing these examples. We also proved that the open data mechanism functions effectively in both the public and private sectors.

Based on the results of these initiatives, going forward, we hope to continue our efforts and verification to contribute not only to the promotion of tourism in the city but across the Bishu area as a whole, which is connected by local industries, by linking various event projects and open data promotion initiatives.

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