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Special Feature

ICT for Tourisum

A Turning Point for Tourism Informatics

"AR HOPE TOUR"

ICT-driven Regional Revitalization

Transformation of the Philosophy of City Walking

Geographic Information Standardization and Potential Applications in Tourism

Report

Report on Disaster and Crisis Management ICT Symposium 2017

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About ITU-AJ

The ITU Association of Japan (ITU-AJ) was founded on September 1, 1971, to coordinate Japanese activities in the telecommunication and broadcasting sectors with international activities. Today, the principle activities of the ITU-AJ are to cooperate in various activities of international organizations such as the ITU and to disseminate information about them. The Association also aims to help developing countries by supporting technical assistance, as well as by taking part in general international cooperation, mainly through the Asia-Pacific Telecommunity (APT), so as to contribute to the advance of the telecommunications and broadcasting throughout the world.

A Turning Point for Tourism Informatics

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One often hears people saying that information is important for tourism, however it seems that there are very few business people in the tourist industry that recognize what and how the information would function in which scenes of tourism. This article will give an overview of the relationship between tourism and information, focusing on ICT, and provide context for thinking about the future of tourism and information.

1. Tourism Informatics Systems

The study of information related to society is generally known as "social informatics." This area can be broadly divided into two fields, one of which is information systems related to science and technology, and the other is those related to humanities and social sciences*1. Research on tourism and information can also be classified in general using this framework.

Figure: Organization of Tourism Informatics

The field of study related to tourism and information is generally called Tourism Informatics, and the quality and quantity of this research has increased recently as the number of tourism researchers has increased. Information systems research in the field of Social Informatics can be applied in the tourism industry, and there are also many systems that have been proposed and developed by science and technology researchers. In Japan, the Society for Tourism and Informatics is leading the way and has published many very interesting research reports[1]. Unfortunately, while there has been high-level research, very little has penetrated to practical business.

Furthermore, humanities and social sciences research in the field of tourism informatics can be further divided into two categories. The first is research on content and media and the second is on management informatics. The former is also called content tourism, and an academic society for content tourism was formed recently[2].

Content Tourism refers to tourism derived from any kind of media content, such as television, movies or manga (comics created in Japan). In particular, many anime enthusiasts make "pilgrimages to sacred places" depicted in their favorite programs and movies. Of course, "pilgrimage" originally means to travel to religiously significant locations, such as Jerusalem or Mecca. However, because anime fans greatly resembled pilgrims in their dedication to content-related locations, these journeys have also come to be called pilgrimages. There has been a veritable boom in pilgrimages in recent years, and in 2016, "Pilgrimage" was awarded a word-of-the-year prize.

Of the categories of tourism informatics shown in the figure, the majority of research in tourism informatics is based on management informatics, will therefore, describe this further in the next section.

2. Tourism Informatics from a Management Perspective

The accumulation of research and practice in management has had various effects on the tourism industry. This section discusses the tourism industry from the perspective of management and management informatics.

2.1 Big Data and CRM

Management information systems brought great change to management, and now, as we enter the Big Data era, we are in the midst of an even greater paradigm shift. Moreover, Big Data is greatly affecting the tourism industry.

An example of Big Data in Japan is the data gathered by transportation IC cards such as Suica, from the East Japan Railway Company (JR East). Initially, the collected data simply indicated where customers got on and off trains. However, the IC cards have since been equipped with an e-money function for various purposes in addition to the function for passing through automatic ticket gates of railways. In this context, the possibility to utilize the collected data has started to be considered.

Although the data these systems can collect is highly sought after by marketers, but personal data is currently legally protected in Japan. Consequently, this "treasure" has remained unexploited. While the utilization of such Big Data is just beginning, there is much promise in finding effective uses that are able to avoid

*1 See: University of Tokyo Social Information Laboratory Guide "Social Informatics I (Systems)", "Social Informatics II (Media)," University of Tokyo Press (1999), etc.

privacy issues.

Returning to our discussion of tourism, this sort of purchasing record can be used by retailers for high-level customer-relationship management (CRM). Service providers can collect data on what, when and how much of products customers purchased. They can then use it to make meaningful suggestions and to provide better services to those customers. Airlines and hotels are already implementing CRM through their own mileage or point systems. As a type of targeted marketing, airlines are giving out bonus miles for flights to particular customers to support sales or to measure demand on particular routes. Premium hotel chains are also collecting data on customer preferences, such as whether guests smoke, which morning paper they read, and the type of view they like. They then share these data over the network. Japanese hospitality services called "Omotenashi", which have thus far relied on the experience and intuition of hostesses or serving staff in Japanese inns and of doormen and bellboys, are now being systematized through the power of ICT. In other words, even if an individual staff member does not have long-term data regarding customers, the company is able to systematize its hospitality services, enabling scientific discussion of Japanese style hospitality as an objective service in terms of modern management practices.

2.2 Changes in Marketing Methods

Through the end of the 20th and into the beginning of the 21st Century, which could be called the period of Internet expansion, travel agencies experienced a shakeout in which conditions forced major companies to restructure operations. This probably does not need much further explanation.

Traditionally, airlines and hotels released blocks of tickets and rooms at low cost, which travel agencies would stock and sell to customers in large quantities with low mark-up. They increased their overall revenue through handling charges. However, this structure was destroyed by direct sales through the Internet. Users can now purchase tickets directly from airline Websites and reserve hotel rooms through travel portal sites. Travel agencies have lost their position through so-called disintermediation*2 .

This shake-out also occurred in similar quantity for American small-scale travel agencies. However, the situation has changed dramatically in the last seven or eight years. In America, there are many "Home Based Agents," which are small scale travel agents operating out of their own homes and this type of agency is reviving. The popularity of SNS, and primarily Facebook, is behind this trend.

Until about ten years ago, an important discussion topic in marketing was how to achieve top ranking in search engine results. However, as search engine optimization (SEO) techniques advanced, a search for something like "Hawaii vacation" only displayed ordinary tours. It became more difficult to find results that suited a user's particular interests using a search engine. Although this issue persists today, it is expected that real recommendation systems using artificial intelligence (AI) will mature in the future. However, I want to emphasize the major role that SNSs are currently playing in the USA in deciding travel destinations. Having choices to suit one's taste as to the destination and mode of travel can make for a very personalized vacation. Furthermore, seeing photos and comments on an acquaintance's timeline is more inspiring than seeing results displayed mechanically by a search engine oriented to the general public. In the USA, the small travel agents mentioned earlier are utilizing Facebook very well, following customers, posting items that could be interesting to them and continuously offering promotions to attract their interest. Customers' interest is generated by these posts, tempting them to take a trip. This approach is now quite refined, and practical seminars for these agents are held at the Travel Agent Forum, a trade fair held twice a year in the USA for small-scale travel agencies[3]. These seminars give instructions on how to post effectively, i.e., on when and what types of messages and photographs should be posted on walls. The author has attended several of these seminars and found them extremely educational.

3. New Trends

In the previous section, we described the current state of tourism informatics, following the progression of conventional social informatics. In this section, we describe some new trends, based on particular features of tourism informatics.

3.1 The Flow from E to M

The International Federation for IT and Travel & Tourism (IFITT) is a global society for tourism and ICT and the leading source for the latest research[4]. Looking at the movement made

*2 For details on this period, see my IPSJ article: Akira IDE, "Current state and prospects for tourism information systems," IPSJ Journal, 48(6), pp. 616-623, (2007).

by IFITT in the past ten years, we have noticed a major trend that the tourism informatics research has not been carried out on fixed desktop equipment, but has been shifting to the research assuming moving element of mobile devices. This trend has been particularly strong in the last five or six years as the smartphone has become widespread.

Multilingual tourism navigation systems are being prepared for well-known touristic cities. For example, several navigation apps have been created for the World Heritage City of Valletta in the tiny Republic of Malta (which the author has visited several times); therefore, a comparison by an ICT specialist might be interesting[*3] . Museums and art galleries also play a strong role as tourism resources, and speech guidance systems for them have also changed over the years. Until about 15 years ago, a dedicated speech guide would be rented and returned upon exiting the facility in most cases. About 10 years ago, it became common to use mobile devices, such as personal digital assistants (PDAs) in this way. In recent years, however, everyone carries their own smartphone. This means that museum and art gallery guides can be increasingly downloaded as apps from the App Store or Google Play. Even the Louvre in Paris is providing this type of service. One could say that enjoyment of museums and art galleries has changed dramatically since these services began, because before apps were provided, even with a voice guide, the experience ended upon leaving as it was difficult to take the information home and review it. With the current download format, users can study ahead and also review after they go home. These museum and art gallery guidance platforms are also becoming somewhat standardized[*4] . This is enabling even small museums with little technical ability or budget to provide visitors with a new experience by loading it onto existing systems, provided they have good content.

Furthermore, even if they are familiar with ICT, tourists are not usually familiar with the area, and are at best weak regarding local information. As such, matching tour operators and local governments, which are the sources of information, with the visitors is one of the challenges of tourism businesses. Therefore, demand for research on development and application of geographic information systems (GIS) and global positioning systems (GPS) is expected to increase and to be a major part of demand volume zone in the future.

The overwhelming success of Pokémon GO last year has shown the potential for location-based games on mobile devices. This is a good example illustrating that even if tourism resources are scarce, there is potential to attract visitors if the information is interesting. Unfortunately, under the current conditions visitors sometimes return home without even noticing attractions in the areas they have visited. In the future, perhaps more emphasis will be given to linking location-based games and the real world by integrating unexploited local cultural resources, or utilizing the exchange among game-related visitors.

3.2 Convergence of Systems and Management

At the beginning of this article, divided the discussion into information systems and management, which is a conventional approach in social informatics. This distinction is becoming very blurred in more advanced work.

Currently, a great range of things can be done in a browser, and many very convenient application programming interfaces (APIs) are available. As a result, this work may become accessible to specialized system experts and not require an engineering professional. Of course, while there still remains detailed work requiring high-level engineers, the conditions of ten or more years ago, when people said, "I'm in management, so I don't know anything about the system," or "I'm in systems, so I don't know about sales," are becoming less common. In tourism especially, everyone has travel experience, regardless of whether they studied humanities or sciences in school. Moreover, everyone is a potential user of tourism when involved in travel. As a result, divisions such as development, planning, and sales are becoming less distinct than they may be in other fields of management informatics.

4. The Paradox of "Developed" Japan

Finally, before closing, I will discuss the state of ICT and tourism in Japan, in its efforts to be more tourism-oriented.

Japan is often referred to as a Galapagos island in terms of ICT, that its technical ecosystem has evolved somewhat differently from the rest of the world, and this Galapagos effect influences the behavior of foreign tourists in various ways.

When planning a train trip outside of Japan, seats can be reserved using the Internet in Europe, Taiwan and even developing countries like Sri Lanka; however, such seat

*3 *MyMalta* and *Visit Malta* apps are popular.
*4 A typical app is Pocket Curator: http://welcome.mapps.ne.jp/pocket

reservations are basically not available for Japan Rail (JR), even with the Japan Rail Pass for foreigners.

The reason generally given to why this might be the case is that, although the railway reservation system, called "MARS (Multi Access seat Reservation System)," is very high quality, it was built in the past during the time of the state-owned and national railway system and was the first railway reservation system in the world. MARS was built as a closed system; therefore, the use in connection with open systems like the Internet was not anticipated, and various difficulties emerged regarding connecting the existing systems to the Internet. The most problematic concern was that the system was naturally designed to use only the Japanese language, and as it still does not support other languages, it is behind in internationalization.

In countries that developed railway reservation systems later, their systems and controls were designed from the beginning to use the Internet and mobile technology, so they are user-friendly for foreign tourists. As mentioned earlier, a typical example of this is Sri Lanka, where their reservation systems were developed after the Internet era began.

This type of contradiction is not limited to railways. Most Japanese inns have not accepted credit cards or allowed Internet reservations, and have been able to carry out their businesses without difficulty since these new systems appeared. Conversely, the inability to support card payments or the Internet can prevent members of the travel industry in developing countries from doing business with customers from developed countries. The fact that Japan is somewhat behind in standardization of tourism related information system may be because there is a sufficiently large domestic market that has enabled providers to get enough business just dealing with domestic residents that understand Japanese.

It is important to be aware that developing new technology inside domestic markets, as Japan has done, has resulted in obstacles today, and lead to an advanced-technology paradox.

There is little motivation to innovate as long as providers are able to generate income despite these Galapagos conditions. In addition to Shinkansen, JR Central and JR East get a large amount of income from commuter passes for work or school, so there is little motivation to invest large amounts to support the relatively few foreign tourists. More foreign tourists have visited Japan in recent years, but this has been due mainly to the simplification of visa controls and improving exchange rates, and not at all because Japan is an easy place to travel.

Since transport and other tourism-related businesses can produce income without innovation, it is important for those companies to be aware of the public mind and feel the need to change to overcome this serious situation. This means asking them to participate in open-data projects currently being promoted by the Japanese government and to become actively involved from the perspective of the public good.

5. In summary

In this short article, I have given an overview of recent ICT and tourism informatics research, and their relation to the tourism industry. Scientific analysis of tourism in Japan is still in its infancy, and many tourism related businesses are more like family businesses than an industry. Our tourism industry seems resigned to these conditions, but modernization using ICT would help revitalize and raise the standards of the tourism industry as a whole. In other words, rather than just supporting tourism with ICT, we should understand that now is the time to research and develop ICT to innovate tourism and the tourism industry.

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"AR HOPE TOUR"

— Earthquake Reconstruction Experience/Disaster-prevention Education Tourism using Wearable-device Glasses —

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1. Introduction

It is now six years since the Great East Japan Earthquake in 2011. Videos from the time being played repeatedly portray the raw power and menace of the tsunami that followed, overwhelming our imaginations. We all recall how we felt powerless, but even though those lessons were carved violently on our memories at the time, in these six years they will have started to fade.

To preserve the memory of the disaster in the affected areas, stories are being told and tours to promote disaster prevention are being given, but the conditions at the time are difficult to convey in words, and it is more and more difficult to experience the conditions at the time of the earthquake, as reconstruction in the region has progressed. Images and video from the time are being used to complement the experiences, but these 2D representations are limited.

We created a solution to this issue with a see-through wearable glasses device utilizing imaging devices and augmented reality (AR) technology. The solution we have developed displays photos of the tsunami damage right after the earthquake and computer graphic data over the real scenery in front of the viewer. Also in addition to providing an experience of the tsunami disaster site, our solution provides high quality advance training and can transform the journey to the site into part of the experience using various imaging devices.

This article describes this technology, demonstrations held in Miyagi Prefecture, and future prospects.

2. Development and sale of SmartEyeglass

In September 2014, Sony announced development of "SmartEyeglass," a see-through wearable glasses device, and began sales in March 2015. It also began providing a software development kit (SDK), which is currently marketed by Sony Semiconductor Solutions Corp.

The device has many sensing functions; including a CMOS image sensor, accelerometers, gyroscope, electronic compass, light sensor, and microphone, as well as smartphone connectivity for obtaining location and other data. The device uses display overlays that allow data to be checked without looking away from the object being viewed. This enables information to be added to the real world, and information can be presented based on the user's situation. The device uses a thin lens rather than a half mirror, which would obstruct the view. The lens is only 3.0 mm thick, has high transparency of 85%, and was made possible with Sony proprietary holographic optics technology. The display is monochrome rather than color to reduce power consumption, and has maximum brightness of 1,000 cd/m^2. The binocular display is able to display easy-to-read text that is highly visible in various environments. The device can exchange sensor, image and other data wirelessly with a smartphone, for use in a variety of scenarios depending on the smartphone application[1]. Sony has begun cultivating companies, developers and other creative partners who are considering solutions and businesses using SmartEyeglass.

Photo 1: SmartEyeglass "SED-E1"

3. Implementing the NATORI AR HOPE TOUR

The National High-School Sightseeing Plan Contest (also called Sightseeing Koshien) was held in August 2014, backed by MEXT and the Japan Tourism Agency. The grand prize was won by Miyagi Prefecture Agricultural High School with their concept, "Feel the Past! Experience the Present! Relate to the Future! Be Enchanted by All—A time-traveling disaster tour (or tsunami affected area tour)" which used AR[2].

While the school was developing the concept with ASA Inc. (headquartered in Sendai City), ASA made a proposal to Sony to use SmartEyeglass in the project. The following year, during the 3rd UN world Conference on Disaster Risk Reduction held in Sendai City on March 15, 2015, they held disaster experience demonstrations in collaboration with the Natori City Tourism Association, with the title, "NATORI AR HOPE TOUR." At each point along the tour, beacons (devices emitting a radio signal) sent signals which were received by smartphone apps, which would send corresponding image data to a SmartEyeglass device connected via Bluetooth. The devices would coordinate with sensor data to display AR images in front of the viewer, which would follow their line of sight. This produced a vivid display of Natori City in the past (before the earthquake), just after the earthquake, and today. Listening to the high-school student story-teller guides made the tour into an experience of hope for the youth who are rebuilding for the future rather than focusing on the tragedy.

Photo 2: Wearing SmartEyeglass at Hiyoriyama

(Left) Experiencing horizontal 360° images of the landscape right after the earthquake, with accumulated debris. The image follows as the users turn their heads.
(Right) Height of the tsunami in the viewing direction displayed with a CG bar. The height level also moves up and down as the viewer looks up and down.

Photo 3: Commemorative photos along the Teizan Canal at the end of the tour. Cherry trees were planted as a prayer for recovery, and a computer graphic AR portrayal of these "recovery cherry trees" as they will be in 10 years was displayed on a tablet for a photograph of all the participants.

4. Expanding the AR HOPE TOUR into Sendai/Tagajo

After the NATORI AR HOPE TOUR, we received many responses, from national newspapers and other media, tourism associations and educational institutions, and we decided to repeat the demonstrations in 2016, keeping creation of a tour business in mind.

There were three main advances from the previous instance: (1) Tohoku University International Research Institute of Disaster Science participated in planning, in addition to Sony and ASA Inc., supervised by Associate Professor Akihiro Shibayama from the university (Disaster Digital Archive Research); (2) Demonstrations were held in the cities of Sendai and Tagajo, incorporating features of the disaster in each location; and (3) The quality of the tour packages was improved using a format of "Prior input through lecture → On-site experience → Consideration from another's perspective." This included a lecture giving an overview of the disaster with the latest video equipment before visiting the disaster site, and sessions afterward, listening to story tellers who had actually experienced the disaster and thinking about it and workshops on topics such as evacuation and disaster mitigation.

Photo 4: AR HOPE TOUR in Sendai/Tagajo leaflet

5. AR HOPE TOUR in Sendai: March 12, 2016 (Sat) exhibit

Before experiencing the tsunami site using SmartEyeglass, an orientation was held using a 4K ultra-short-throw projector (VPL-GTZ1) provided by Sony Business Solutions Corp. The high-resolution 4K aerial photographs taken directly after the earthquake gave participants a spatial understanding of the earthquake site and threat of the tsunami and totally immersed them in the aftermath of the tsunami.

Photo 5: Participants drawn in by the 4K high-resolution video

Participants then boarded a bus for the Sendai Arahama Elementary School, which was hit by the tsunami. On the bus, they experienced the disaster site through 360° whole-sky video collected by Tohoku University over the two weeks following the earthquake and shown using Xperia Z4 tablets from Sony Mobile Communications Inc.

Photo 6: 360° video of the area surrounding the bus from the time of the earthquake, shown clearly on the Xperia Z4 tablet. Participants entered their disaster experience contrasting it with the debris cleaned up in current surroundings outside the bus.

Finally, they arrived at the disaster site, Arahama Elementary, 700 m from the sea shore. This area received the worst damage within Sendai City, and more than 180 people were lost. Arahama Elementary has been preserved in Sendai City as a reminder of the earthquake.

Photo 7:
(Left) Arahama Elementary after the disaster. People trapped in this area narrowly escaped with their lives (Photo: Sendai City)
(Right) Arahama Elementary (during tour)

During this tour, the tour guide sent images from his smartphone to apps on the participants' smartphones rather than using the beacon format as in the previous tour. This improved operation.

Wearing the SmartEyeglass in front of the Arahama Elementary school building, participants could see AR images

of the mountains of debris at that location immediately following the earthquake, overlaid on the current scenery, which provided a realistic experience of the untouched remains after the earthquake. The height of the tsunami was also shown in AR, using a bar over the school building. This gave a sense of the height that was difficult to get from the ground surface. Sighs and surprised exclamations were heard all around as the participants recognized the terror of the tsunami.

Photo 8: Wearing SmartEyeglass in front of the school building. Seeing the mountains of debris and the height of the tsunami left participants speechless.


Photo 9:
(Left) Moving to the roof of the school to see the height of the tsunami from above.
(Right) Participants experienced the onslaught of the tsunami through images of the Arahama area and testimony of survivors recorded during the tsunami, shown clearly in color on the tablets.


Later, they took a walk to the sea shore. Using AR to compare images just after the earthquake with the current scene showed how the tsunami erased a village of some 800 houses in an instant. Even five years later, it was unchanged, with only the foundations remaining.

Photo 10:
(Left) This area was the only swimming beach in Sendai and was a thriving center. The bare foundations of the houses washed away by the tsunami are all that is left.
(Right) Finally, in front of the disaster monument, all participants put their hands together in prayer for the many lost in the disaster.


Participants completed their AR experience of the tsunami site, returned to the bus and moved to the Shichigo Community Center. Lastly, they had an opportunity to hear from actual victims of the disaster in the Arahama area, who are actively telling their stories today. They had a chance to seriously reconsider for themselves, what they should do if an earthquake occurs. That concluded the tour.

Photo 11: Describing conditions and telling emotional stories of their experiences of the earthquake. Storytellers emphasized the terror of the tsunami and urged listeners to prepare for disaster prevention saying, "Decisions and behavior right after the earthquake determined life or death. We hope you will put this lesson into practice."


Photo 12: Students from Miyagi Prefecture Agricultural High School, who originally proposed the 2015 "NATORI AR HOPE TOUR", also participated. They were very impressed with the wonderful upgraded experience. They were both delighted and happy to see their original idea developed further.

6. AR HOPE TOUR in Tagajo: March 26 2016 Exhibit

A tour was also held in Tagajo City to experience the tsunami in an urban environment.

In contrast to the Sendai City experience, Tagajo was based on a "City Walk" format. The arrival of the tsunami was not visible among buildings and the complexity of the onslaught was terrifying. The experience raised participants' awareness of disaster prevention.

Participants first experienced 360° whole-sky video of Tagajo City two weeks after the earthquake in an air-dome theatre provided by Wakayama University. The air dome video simulated an experience of being in the site just after the earthquake. One city staff person said that seeing the debris along the rail lines brought tears to her eyes as the memories came back.

Photo 13: The mobile dome system from Wakayama University. Providing a simulated experience with 360° whole-sky video taken by Tohoku University using a vehicle mounted camera


Next, participants went by bus to the Sony Sendai Technology Center (Sony Sendai Tech) to begin their "City Walk."

The gyro-sensor in the SmartEyeglass enables it to know its position and orientation. Participants learned about the complex

Photo 14:
(Left) In the bus headed for Sony Sendai Tech, participants used tablet computers to learn about disaster conditions in Tagajo from video taken during the disaster and victim testimonies
(Right) Sony Sendai Tech, a familiar place to Tagajo residents. The affiliated Sony Sendai FC won the Japan Football League (JFL) Championship in 2015. It has become the hope and pride of residents after the earthquake.


characteristics of the "Urban tsunami disaster"[3], with buildings and flat geography making it impossible to see the arrival of the tsunami. Getting a sense of the relative positions of the ocean and rivers, helped to understand how the tsunami flowed directly from the Port of Sendai and also up the Sunaoshi River and over the broken levees, following the railroad tracks from two directions in complicated patterns.

Photo 15:
(Left) Associate Professor Akihiro Shibayama from Tohoku University, as the tour guide, provided all content and supervised all scenarios for the AR HOPE TOUR. It was a valuable opportunity to learn directly from a disaster prevention training professional.
(Right) Within Tagajo City. Wearing SmartEyeglass, AR images were shown in 360° panoramas at different locations and distances, including the Port of Sendai, the Sunaoshi River, and a large commercial facility. Participants considered what they would do faced with a tsunami incoming from two directions.


The end of the City Walk was at "Sue no Matsuyama". This place, famous in Tagajo City, is also featured in the Hyakunin Isshu ancient collection of Japanese poems[4]. It is high ground, so even today, the tradition is passed on that it is a good place to seek refuge from a large tsunami. In fact, the tsunami did not reach it after the Great East Japan Earthquake either, and it was a refuge for many.

Photo 16: Matsuo Basho also visited with his apprentice Kawai Sora during his "Narrow Road to the Interior" journey.

After the tour, the participants returned to the starting point and participated in a workshop on disaster reduction.

They were divided into several teams to discuss any measures, no matter how small, to mitigate the disaster, and characteristics of the "Urban tsunami" learned from their experience in the tour. They also presented their results. It was an opportunity for participants to think seriously about what they could do in the future to mitigate disaster.

Photo 17:
(Left) At the end of the program was a workshop to think about how to use the experiences and lessons from the "AR HOPE TOUR" to reduce disaster in the future.
(Right) Participants from diverse regions, age-groups, and lifestyles gathered to consider what "disaster reduction" means to them.


7. Future developments

The "AR HOPE TOUR in Sendai/Tagajo" was covered in television, newspapers and on the Web and other media and was very highly rated by the participants.

Of the ten-year reconstruction period defined in the Great East Japan Earthquake Reconstruction Basic Law, the initial five-year "Concentrated Reconstruction Period" has ended, and the subsequent five-year "Reconstruction and Revitalization Period" has begun [5].

The AR HOPE TOUR project promoted by Sony, ASA, and Tohoku University, is contributing to earthquake experience and disaster prevention education as well as reconstruction and revitalization through a series of demonstrations, and is encouraging collaboration between the tourism industry and government to build businesses in Tohoku disaster prevention education and sightseeing tourism.

The project is also advancing to the next stage, as Kinki Nippon Tourist Co. Ltd. has recently joined. Our goal for the summer of 2017 is to start an "AR HOPE TOUR" in Sendai City as an on-site package tour with these same companies.

In the future, we hope to produce even higher quality earthquake experiences and disaster prevention education through collaboration with various industries and organizations and with Sony technologies and products such as SmartEyeglass, and to contribute to reconstruction and revitalization in Tohoku and to disaster prevention and mitigation around the world.

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ICT-driven Regional Revitalization

— *seichi junrei by the numbers* —

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1. Background

In 2016 the animated feature film, Your Name, premiered to critical acclaim, and the same year the neologism *seichi junrei* (anime pilgrimage site) made the short list for the buzz word grand prize of 2016. More specifically, *seichi junrei* refers to travel by dedicated fans to the towns or sites where animated films or dramas were staged, and sites that attract repeat visitors in particular are dubbed *seichi junrei*, or anime pilgrimage sites.

To capitalize on this growing trend, Sony launched a startup business called *Butai Meguri* in March 2013 that currently links over 70 anime pilgrimage sites and offers a wide range of content. *Butai Meguri* is by far the largest service in the content tourism industry. Leveraging augmented reality (AR), location information (GPS), and content, the service is an app-type platform that opens up a whole new experience to the fan user base. The key point of *Butai Meguri* is that it's not just another on-screen game, but an application that harnesses real images, allowing users to actually see the local landscape, and immerse themselves in the community. These capabilities bring fans back to anime pilgrimage sites as repeat visitors, and this is what really distinguishes *Butai Meguri* from other services.

2. *Seichi Junrei* by the Numbers

In 2016, more than 50,000 fans made pilgrimages to anime sites accompanied by *Butai Meguri*. Table 1 is a summary overview of the number of users visiting the top-ten sites.

As one can see from the table, the place that is currently drawing the most visitors is the town of Oarai in Ibaraki Prefecture, a quintessential *seichi junrei* pilgrimage site. Oarai was placed under a spotlight when the movie *Girls und Panzer* was released in 2015. A six-part anime series has been announced that will play out over five years, and excitement is building with each passing year.

Table 1: 2016 Butai Meguri Visitor Ranking

	Title and City/Region	Visitors
1	Girls und Panzer (Oarai)	9683
2	Love Live! Sunshine!! (Numazu)	9596
3	Wake Up, Girls! (Miyagi)	3850
4	Anohana: The Flower We Saw That Day (Chichibu)	2582
5	Flying Witch (Hirosaki)	2402
6	The Anthem of the Heart (Chichibu)	2182
7	Encouragement of Climb (Hanno)	2034
8	High School Fleet (Yokosuka)	1800
9	Hyōka (Takayama)	1587
10	Meikoi (Nagoya Meiji Mura)	1114

1 and 2 earned high rankings with good storylines and local efforts, while 3 gained visitors over time through ongoing events.

Close on its heels in second place is the city of Numazu in Shizuoka Prefecture. Actively promoted by the copyright source animation studio Sunrise and the local community, the *Love Live! Sunshine!!* fan base has skyrocketed thanks to a series of ongoing events.

Currently, cities categorized as the *seichi junrei* pilgrimage site are flooded with over 100,000 fans every year, and is attracting much interest as a stratagem for rejuvenating local communities.

Generally, the anime-induced *seichi junrei* phenomenon is associated with fans in the Kanto region centering on Tokyo, but

Figure 1: Collaboration with Hirosaki Tourism and Convention Bureau

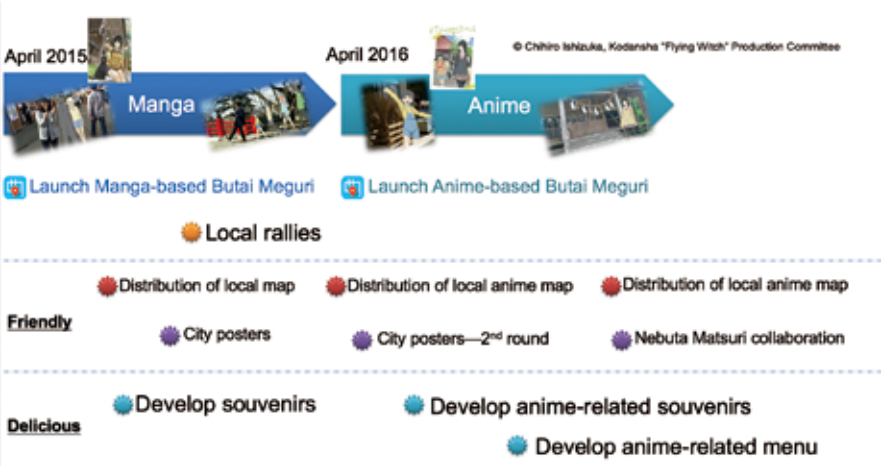
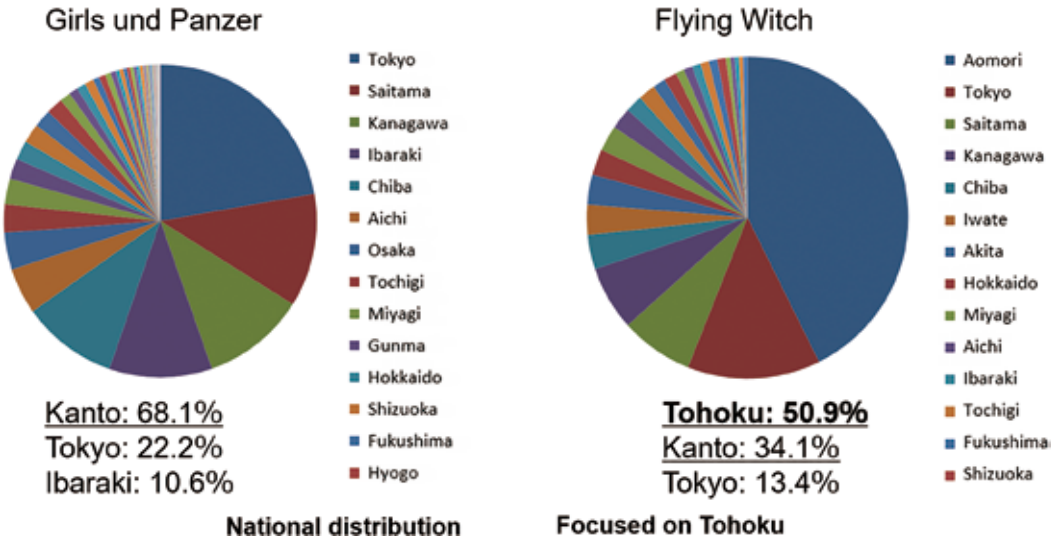


Figure 2: User Analysis (where visitors came from)



we rolled out the *Butai Meguri* service in other parts of the country far removed from Tokyo and here I will present some examples of how the service has gained traction among local fans in other areas.

First, let us consider Hirosaki in Aomori Prefecture, which came in 5th in the top-ten ranking for 2016. Working closely with the Hirosaki Tourism and Convention Bureau, we organized rallies through *Butai Meguri* about a year before the animated television series *Flying Witch* was aired, and we made sure that everyone in the community knew that the story was rooted in Hirosaki (See Figure 1). When *Flying Witch* started showing in April 2016, it was an immediate hit. That coupled with the warm reception of visitors to Hirosaki triggered a barrage of tweets and messages on social networking sites (SNSs) that brought in even more visitors.

What is remarkable here, as illustrated in Figure 2, is the prefectural origins of users enrolled in the *Butai Meguri* service. The left side of the figure shows an analysis of where fans using *Butai Meguri* came to Oarai in Ibaraki prefecture from in 2016. One can see that some 60-70% of fans visiting Oarai as an anime pilgrimage site came from the Kanto area, which can be attributed to easy access to Ibaraki from Kanto.

Now turning to *Flying Witch* shown on the right side of the figure, one will notice that about 50% of the visitors came from the Tohoku region in northeast Japan where Hirosaki is located. This is significant, for despite the inconvenience and the formidable distance from Kanto to Hirosaki, this pilgrimage site still ranked 5th and hosted thousands of visiting fans. This reveals that there are many fans in Aomori and other parts of Tohoku who are interested in visiting anime pilgrimage sites, and perfectly illustrates that content-driven tourism and pilgrimage sites can occur anywhere in the country.

3. Anime Pilgrimages: A Solution for Regional Revitalization

The question arises, does any blockbuster hit automatically produce a pilgrimage destination? Within the content tourism genre, we find that the greatest motivator of fan tourism is not anime or manga, but rather NHK's year-long historical taiga drama series. Last year's series was *Sanada Maru*, named after a fortification defended by Sanada Nobushige during the Siege of Osaka in 1615. As the drama aired all through 2016, the number of visitors to the newly opened Shinshu Ueda Sanada Maru Taiga Drama Museum located near the site of the remains of Ueda Castle associated with the story topped one million.

It is typically the case, that once a town is featured as the setting for a taiga historical drama, the town is inundated with visitors for the year that the show is broadcast, but the numbers fall off precipitously as soon as the show is over. Certainly, if you can temporarily bring people into the community for special events and concerts this helps revitalize the local economy, but this alone will not benefit the community over the long term.

Some communities have found a way to successfully leverage the anime pilgrimage phenomena by bringing fans back to their towns repeatedly where they spend money for basic services—meals and accommodations—and thus contribute to revitalize the community and the region.

Let us now take another look at the *Butai Meguri* data for 2016 in Table 2. This time the content is ranked in terms of number of

Table 2: Rate of Repeat Visitors

		Average number of visits
1	Wake Up, Girls! Another Real	2.750
2	Wake Up, Girls! (Miyagi version)	2.010
3	Love Live! Sunshine!!	2.006
4	High School Fleet	1.907
5	Encouragement of Climb	1.882
6	The Disappearance of Nagato Yuki-chan	1.755
7	Ordinary High School Girls Tried Being Locodols	1.747
8	Haruchika: Haruta and Chika Enjoy Their Youth	1.735
9	Wake Up, Girls! (Tokyo version)	1.661
10	In This Corner of the World	1.632

Repeat rate indicator—*Butai Meguri* X (anime/manga + pilgrimage sites)—reveals approximate number of core fans.
Fans make repeat visits when attracted by events and appeal of the site. WUG AR took 1st place because it's a tour event, and many users visited over several days.

Figure 3: Wake Up, Girls! Another Real: Where Visitors Came From

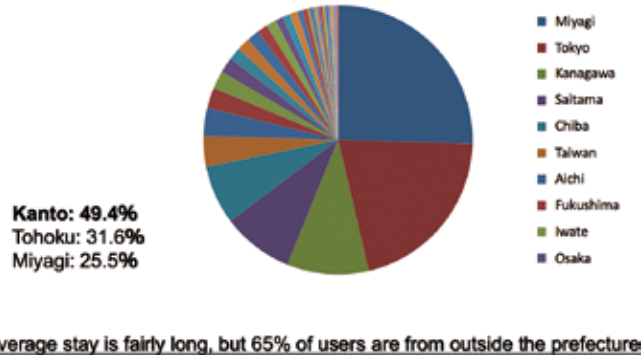


Figure 4: Butai Meguri Cards

per-person visits they inspired. One can see that *Wake Up, Girls! Another Real* drew the most repeat visitors, but we should note that this is not so much an anime-driven pilgrimage site as a content-based local tour event. Visitors experience a drama that is set in the community by touring seven different locations throughout Miyagi prefecture based on original *Butai Meguri* content.

Figure 3 shows a schematic of where the participants in this event came from. It is impossible to visit all of the sites included in this tour event in a single day, so most users spend at least a couple of days in the area. One would assume that most of the users are from Miyagi prefecture which is geographically closest to the site, but somewhat surprisingly we find that more than 50% of the visitors are from Kanto—including Tokyo, Kanagawa, Saitama, and Chiba. Since most of these hard-core fans spent several days in Miyagi having come all the way from Tokyo, they spend considerable money in the local community for transportation, accommodations, meals, and so on, and this was a major economic benefit for the community.

In addition, *gourmet cards* were widely distributed to introduce fine restaurants in the area—when visiting Miyagi, "you can't go wrong if you eat here!"—and no doubt this prompted more patronage for local businesses (see Figure 4). Thanks to the distribution of these cards, visitors who first came for the event pilgrimage have come back to Kesennuma and other towns in Miyagi prefecture and patronized sushi restaurants and other places touted by the gourmet cards.

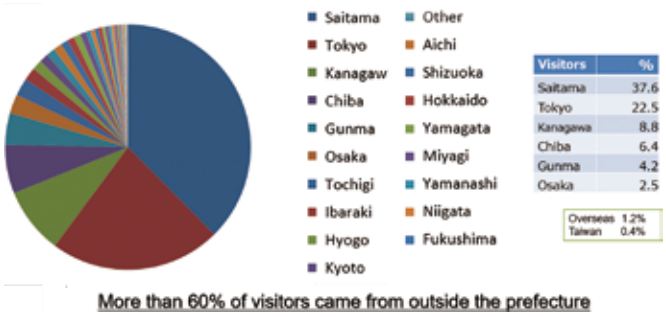
It will be apparent from this example that content tourism does not require sites associated with anime or televised dramas, but in fact can be created by any activity that brings people together and converts people into repeat visitors to the area.

4. Potential of Cross-Events

So far we have discussed the *seichi junrei* phenomenon in terms of a one-on-one association between one type of content—movie, manga, anime, etc.—and a particular pilgrimage site. But let us next consider the *Saitama Seichi Cross Rally*, a cross-content event that was conducted over a three-year period beginning in 2014. This was a more far-reaching event that went beyond the one site associated with one anime to encompass a cluster of pilgrimage sites spread across Saitama prefecture. During 2016, about 7,000 fans participating in the *Saitama Seichi Cross Rally* event (see Figure 5). The rally had two fundamental objectives:

Figure 5: Poster for the Saitama Seichi Cross Rally 2016

Figure 6: Where Visitors Came From



More than 60% of visitors came from outside the prefecture

- To raise awareness of the event in Saitama prefecture, and to increase the number of participants from within the prefecture.
- And to spread the word to people in Saitama and in other prefectures that Saitama has many anime/mange pilgrimage sites, with the idea of boosting tourism in the prefecture.

Figure 6 illustrates where the participants in this event came from. We saw earlier in our analysis of *Girls und Panzer* in Figure 2 that most of the fans flocked to the pilgrimage site in Ibaraki prefecture from Tokyo, but for this rally event most of the participants lived in Saitama prefecture. At the same time, the data also reveals that 60% of the visitors came from outside Saitama, which shows that the event successfully motivated people from other prefectures to take part in the event even though the theme was focused primarily on Saitama. Roughly 8,000 photos were posted to social networking sites while the event was in progress, and this generated enormous attractive interest in the prefecture.

Over a six-month period, the average stay to participate in this event was 2.74 days. In other words, fans coming for the event spent close to three days in Saitama. Through participation in this Saitama-oriented cross anime/manga event, visitors observed Saitama's beautiful landscape first hand, developed a close fellow-feeling with the locals, and naturally this encouraged them to come back to Saitama prefecture again as a repeat visitor. We realized that this kind of event did indeed have great potential.

5. Law for Generating Repeat Visitors

In order to become a true anime pilgrimage site, the site must somehow inspire fans and visitors to come back again. We came up with a solution using *Butai Meguri* by working with multiple sites around the country.

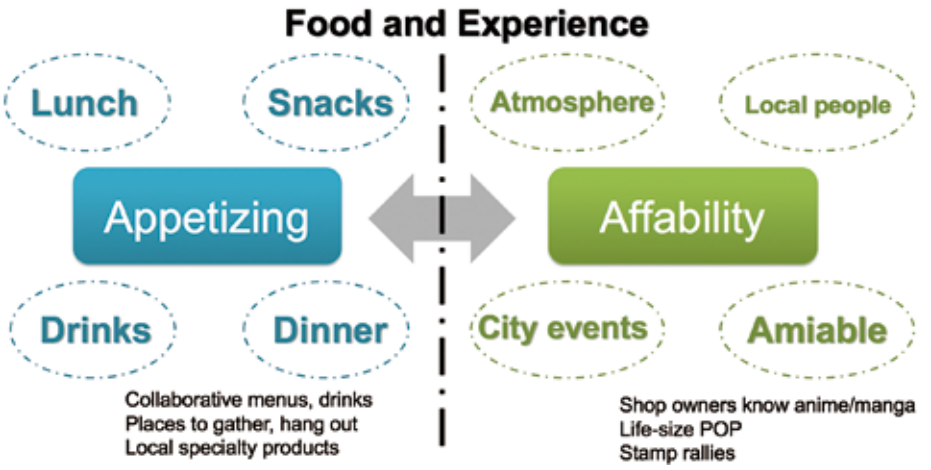
In order for a site to emerge as a successful pilgrimage destination, the environment or atmosphere of the location is more important than the success of the anime or manga content associated with the site.

Fans who appreciate anime or manga content deserve the emotional experience seeing the scenes from the comics or anime before their own eyes when they make a pilgrimage to the actual site inspiring the story, and most first-time visitors to pilgrimage sites in particular hunger for this kind of emotional experience. The more popular content inevitably attracts a huge fan base, which translates into a correspondingly large number of first-time visitors. Consequently, first-time visitors come to pilgrimage sites in droves, which makes these sites look like genuine *seichi junrei*, yet most of these fans only visit the site once and don't come back a second or third time.

But the real *seichi junrei* success stories are those sites that attract a certain number of fans to make more than three visits. These fans come back to the same site over and over again to relive the experience of their first visit. But they also find other reasons for coming back; they discover the novelty and charm of visiting new places, and spread word of the site to friends and acquaintances through social media to create other repeat fans.

These sorts of sites generally have two factors in common (see Figure 7).

Figure 7: Tips for attracting people back to your town



- First, they offer *appetizing food*: Usually when traveling, you will be eating in restaurants, and appetizing food makes for a good mood. It's important to find decent restaurants and pleasurable eating experiences at pilgrimage sites that motivate favorable tweets about the experience on social media.
- Second, the sites provide *affability*: For fans who are into anime and manga, they are looking for a place where they will be fully accepted. It is important that pilgrimage sites make fans feel welcome by showing interest and support for the anime and manga associated with their towns.

I think the proper term here would be *self-affirmation*, the idea of giving anime fans exactly what they want, and something they can write home about: make the fans feel safe and content just to be in the place associated with their favorite characters.

Or conversely, towns can attract repeat visitors by merely making these conditions available. When revitalizing cities by leveraging content, we recommend taking both of these factors into account—offering visitors appetizing food and pleasant affability.

6. Transition from "Moving Things" to "Moving People"

A major initiative in the regional revitalization effort is the hometown tax deduction system, known as *furusato nozei*. Basically, this allows taxpayers to make donations to municipalities and prefectures of their choice, and thereby qualify for deductions up to a certain limit on their income and residential taxes. The cities then hand out return gifts to the people who contributed to the hometown tax, but these gifts sometimes miss the mark. Local specialties are sometimes offered as return gifts such as meat or rice, but these products offer little in terms of PR value for the local communities.

This led us to come up with a new *Butai Meguri* initiative in September 2016 called "*Ikeru! Furusato Nozei*." We devised a more popular slate of return gifts including content-related goods and *Butai Meguri* experience tickets and coupons that give users access to original stories about the local community, which encourages the recipients of the gifts to actually come and visit the community. In effect, this scheme channels donations to municipalities through the hometown tax deduction system, but also brings money directly into the community when donors visit and make purchases in the community (see Figure 8). The town of Oarai in Ibaraki prefecture has already taken in ¥30 million in donations during the first year after this scheme was rolled out.

7. Conclusions

Anime pilgrimages (*seichi junrei*) and content tourism have enormous potential for revitalizing local economies. But just trying blindly to attract content to a community is not enough, for it is only by bringing together a fan's plan to explore a local area and a platform that can provide such a plan that one can achieve continuous success.

App-type platforms are clearly an effective scheme for revitalizing local economies, and we can expect to see many revitalization schemes based on this approach in the years ahead. But when this happens, we cannot just depend on empirical rules. Rather, we must be capable of visualizing and quantifying user behavior in real numbers in order to come up with continuous, sustainable regional development plans. This is the real secret of success. If we can figure this out, then we will be poised to address the issue of how to produce repeat visitors—that is, how to achieve *seichi junrei* or anime pilgrimage sites—for any regional community.

Figure 8: Ikeru! Furusato Nozei

Transformation of the Philosophy of City Walking

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1. Introduction

In February, I had four days to stroll the streets of Bangkok. I was coming back to Bangkok for a short stay in April, so instead of visiting the more usual places, I was avoiding the touristy districts in search of lodging. There were lots of stations along the elevated BTS line where I had never been before, so I was visiting residential districts where I had never set foot. Bangkok is wonderfully calm and peaceful. I visited Manila a number of times during its remarkable economic growth, but Bangkok had a very different feel about it, none of the strained tension in the atmosphere that one experiences in other places.

I used to visit cities in the U.S. and in Europe, but over these past five or six years city walking has really taken root here in Asia. I really got into it, and found myself roaming the back streets of cities with map in hand. One discovery after another, though of course, countries are all different. Exploring a city at street level to see what one might find, while contemplating what one discovers. This is my preferred way of touring a city.

I have long been interested in cities, more particularly in the bawdy vulgar spaces one finds on narrow streets and alleyways. Although they are gradually disappearing from cities around the world—and from Japan's cities as well—these sorts of leftover spaces that exude a disordered, confused atmosphere still exist, and are a constant font of some sort of activity or movement. One could say that these disordered, confused urban spaces have played some sort of incubation role. These places have always been confined to actual real places, actual cities, but now we are seeing the emergence of virtual cities on the Internet.

Times change, and inevitably people behave differently to accommodate those changes. A mere twenty years ago the Internet was scarcely known, and the same could be said for mobile phones. People back then would be astounded to see how the information environment has evolved today. We have seen a new development in city walking with the release of the location-based game *Pokémon GO* in 2016. Providing convergence between the real and the virtual, *Pokémon GO* became a global phenomenon by exploiting augmented reality (AR) technology.

As a collaborative venture between Niantic and the Pokémon Company, *Pokémon GO* is a GPS location-based, augmented-reality mobile game for smartphones based on popular Pokémon characters and the mobile game *Ingress*. Players use GPS features on their phones to locate, capture, train, exchange, and battle virtual pocket monster characters on the screen as if they were in the same real-world location as the player. *Pokémon GO* is free-to-play, but also supports in-app purchases of additional in-game items. Here in Japan, *Pokémon GO* has tie-ups with Aeon Group and a host of other partners.

One can appreciate from the emergence of *Pokémon GO* that a new mode of city walking has developed out of old conventional city strolling in a real city. Here I will provide a chronological timeline showing some of the new threads of city walking now emerging from the conventional practice of exploring cities on foot.

2. Philosophy of City Walking

In my book "Back Streets Create Culture: Transformation of Narrow Streets and Neighborhoods" published in 2012, I observed that "the growth of cities is not necessarily a virtue," and eulogized the appeal and significance of back streets and alleyways that so often disappear during urban renewal projects. Of course I did my homework, and wore out several pairs of shoes exploring cities on foot. I limited myself to domestic cities, so I walked the length and breadth of Tokyo, Osaka, Kyoto, Kobe, Sapporo, Fukuoka, Hiroshima and other cities several times over. This was at the beginning of my preoccupation with *content tourism*, and before that I was very interested in *theories of place*.

Theories of place are theoretical attempts to identify people with places or spaces, and can be traced back to Aristotle's "Physics." There is a well-known interpretation of Aristotle by Henri-Louis Bergson, but Bergson defines place as a container-like boundary that holds an object, and objects must occupy some particular place. As human beings became conscious of sanctified sites and hallowed ground, we find that certain tracts of land have a unique "spirit of place" (genius loci). Hiroyuki Suzuki (1990) eloquently described genius loci in terms of historical background and ambience of various sites.

Exploring the way humans recognize place using perspectives of history, anthropology, and other disciplines, geographer Y.F. Tuan (1992) carved out a new discipline called *phenomenological geography or place theory*. By conducting a structural analysis of love of place, his position had an enormous impact on everything from thinking, philosophy, and psychology to environmental theory. Edward Relph claims that, in this modern era of pervasive mass production and commercialism, we would expect the significance and diverse environmental compatibility of place to be largely lost, and replaced by rampant *pseudo places* dominated by *placelessness*. While focusing on the characteristics of modern placelessness—Disneyfied, museumised, futurist—Relph nevertheless does not reject *placelessness* out of hand.

There has been a good deal of discussion around the notion

of place, but today no discussion of place can ignore virtual space. Virtual space is set up in opposition to real space. A community organized in virtual space is obviously very different from a group in real space, but information is shuttled back and forth in a timely and appropriate manner. Japanese tend to prefer anonymity, so forging face-to-face relationships in virtual space can be difficult. Forging individual bonds of trust in virtual space is decidedly different from forging such bonds in real space, yet one cannot talk about society without including virtual space.

Much like close relationships with other people, places are also critically important—even essential—for most of us. When we find ourselves in such places, we are very much under the influence of the place. As living breathing entities that exist in reality, human beings cannot exist apart from the places they inhabit. Throughout their lives, humans always exist somewhere, they live in relation to specific places.

Wajiro Kon, renowned as the father of *modernology*, a branch of sociology which studied the changes in cityscape in the prewar years, later joined forces with the Roadway Observation Society (ROJO Society) in the context of this theory of place. The primary emphasis in on observation, but this too is a form of city walking to explore layers of the city's urban fabric often drawing upon Edo kirie-zu, detailed woodblock print maps of Edo era districts. Behind this boom is the popular NHK TV program *Bura-tamori*, in which TV personality Tamori walks through towns while talking about the history and culture of the areas he visits. This highlights another aspect of city walking by enabling strollers to envision the activities of people who lived in the places visited. My interest in content tourism also derives from the envisioned activities of times past.

In the growing literature on city walking, I am particularly taken by a book written by Kiyokazu Washida, a philosopher and prolific author: "Kyoto Normal Temperature: Philosopher's Guide to the City" (2007) (see Figure 1). Quite literally, the book describes a philosopher's stroll through Kyoto. First, we are taken on a tour of the old Kyoto metro bus service route 206 (now discontinued) that used to circumvent the city. Leaving Kyoto Station, the bus heads east on Shichijo-dori, then turns north on Higashi-oji. The bus passes Gion, Okazaki, Hyakumanben, and Takano on its way to Shimogamo via Kitayama-dori. The bus now crosses the city to Murasakino in the west, and turns south on Sembon-dori. Finally, the bus closes the loop by returning to Kyoto Station by way of Shimabara and Nishi-Honganji temple.

"Morally questionable activities are pushed to the edge of the city. And once they reach Yasaka Shrine, they are already pressed against the foothills with no where to go. With no where to go, these dubious activities steal furtively back into the city, but Kyoto pushes them back again toward the edge. These morally dubious activities occupy the interstices between city and country, between Gion and the city proper where they lead a glittering existence—which is to say, drab and stagnating" (p. 67).

Parts of any city are definitely disordered and confused. Washida employs the term *morally questionable* for what is more

Figure 1: "Kyoto normal temperature: philosopher's guide to the city," by Kiyokazu Washida, Kodansha, 2013.

generally referred to in urban theory as the *entertainment district*. And his notion of *edge* is oddly familiar. While not all cities have this *edge-like* aspect, most do have an entertainment district, and Kyoto in particular does have an *edge*.

Jane Jacobs (2010) defined four conditions for city diversity that produce lively cities: (1) first, districts and as many subdivisions as possible must serve more than one primary function, (2) second, city blocks should be short to increase options for walking further than a block and turning corners, (3) third, buildings should be of varying ages and the scale of building in the mixture should be similar, and (4) forth, there should be a dense concentration of people. Note that all four of these conditions are necessary to generate urban diversity. I think that Jacob's argument undergirds many of Washida's observations.

"The notion that Kyoto is an *ancient capital* is of course a complete fabrication. Certainly, there are a few old building here and there, restrained in style and desolate. But, Kyotoites are unusual in that they like *seasonal goods* and *new things*" (p. 136).

One should not view Kyoto through the old stereotypical lens as an ancient capital. Indeed, Kyoto's streets are crowded with stylish cafés and hotels, and many of Japan's leading companies are located in Kyoto including Nintendo, Wacoal, Kyocera, Omron, Rohm Semiconductor, and many others. This is another dimension of Kyoto. Again, the charm and appeal of city walking

is the sense of discovery and acquisition of knowledge about a place. Looking for the old in the new and the new in the old on the back streets of Kyoto heightens the appeal of city walking.

But Washida's book goes beyond merely offering impressions and historical details of the author's meanderings through Kyoto, for the story is clearly told through the eyes of a philosopher.

"And it's not because Washida is brilliant and capable of writing a book—rather, it is because the book is readable and totally absorbing!" This accolade by Professor Kuwahara is a clear sign that the tired old prevailing views of Kyoto have been overturned" (p. 121).

The reader is thus led to ponder different things even as he is guided on a pleasurable tour of the cityscape. An interesting aspect of city walking is the way we are inspired to think as we contemplate the landscape. We find many examples of this in Washida's book. He reveals the importance of placing ourselves in a totally different context or environment. Consider our enjoyment at being inspired by a round of visits to places far from our usual haunts, even to strange foreign lands.

"Events carved into memory can be painful, as we churn over heartrending events in our minds. And as we process these events, we realize that this really touches the very core of our existence. Even *stories* that are firmly lodged in our memories can undergo a process of reweaving in a totally different direction. This can be a risky business, for memories can sometimes be replaced by an overly clever *rationalization* in an unguarded moment" (p. 253).

While presenting itself as a city walking guidebook for Kyoto, the discussion expands in all directions in a most fruitful way. Washida's book, "Kyoto Normal Temperature: Philosopher's Guide to the City," had an enormous impact on my own personal feeling toward the philosophy of city strolling. This is a book that I will take up and read again when the words begin to fade.

3. Content Tourism and AR City Walking

It is no coincidence that I was working for a record company when I first began exploring content tourism. Therefore, I routinely began my research with a local song, not an animated film. This led to a study of *literary tourism*. The goal of the first literary town tour was to identify the Iruka Hotel or the Dolphin Hotel (*iruka* is dolphin in Japanese) that figures in two of Haruki Murakami's novels: "A Wild Sheep Chase" and "Dance, Dance, Dance."

In "A Wild Sheep Chase," the unnamed narrator while at the Dolphin Hotel in Sapporo learns clues about a mysterious sheep, and eventually has a fateful encounter with *Sheep Man*. In the second half of the book, the protagonist and his girlfriend, who possesses magically seductive and supernaturally perceptive ears, travel to the north from Tokyo to Sapporo by plane. They get coffee at a coffee shop, go to a movie theater, then take a stroll in the evening, and go into a restaurant that they had noticed earlier.

To get to the Dolphin Hotel from the movie theater, you cross three streets to the west then go down one street to the south. The hotel is described as small and rather innocuous. Apparently, there is no actual Dolphin Hotel, but if it did exist, it would be situated along the short stretch between Minami Sanjo-dori and Susukino Street. The depiction of the neighborhood closely resembles the jumble of multi-tenant buildings at this location. "A Wild Sheep Chase" was published in 1982, so of course the author would be describing Sapporo before 1982. However, Murakami's sequel, "Dance, Dance, Dance," mentions the date March 1983 at the very beginning of the book, so there is clearly a gap of several years. We would also note that the Iruka Hotel is now described as the Dolphin Hotel (Figure 2).

I can't define exactly when it happened, but I found this investigative process very interesting, and stepped up my study

Figure 2: Iruka (Dolphin) Hotel, Kunio Nakamura and Hiroko Dozen, Rokujigen, 2014

of content tourism. Extending this approach to other areas of content, I published "People who Travel in the Story: What is Contents Tourism?" in 2010. At the time, rural distress was chronic and villages and towns were transitioning from a settled residential strategy to one of attracting new people into their communities. This same point is highlighted in the charter of the Academy of Contents Tourism, of which I am a founding member. The idea is to establish methods of harnessing content at the local level and build up sustainable strategic structures through surveys, analysis, and discussion within the Academy of Contents Tourism, and make this information widely available to as many people as possible.

In the year 2016, a great deal of interest was focused on "pilgrimages to all the sacred sites" associated with animation. We saw a great increase in the number of pilgrimage fans after the release of the highly successful animated film, "Your Name," and fans gathered at all the sites associated with the story. Indeed, the term "pilgrimage to sacred places" (*seichi junrei*) to describe this phenomenon was nominated as one of the top buzzwords for 2016. This suggests that content tourism—including fans making pilgrimages to sites featured in animated films—may be entering a new phase. Seven or eight years ago the whole concept of content tourism was little known, but today *seichi junrei* (pilgrimage to sacred places) is in everyone's vocabulary, and content tourism stands on its own.

Well-known cultural critic and novelist Hiroki Azuma stated "the fact that "Your Name" was such a smash hit proves that animation is no longer just the provenance of nerds and geeks (http://blog.livedoor.jp), but I think the show's popularity can also be attributed to the pilgrimage phenomenon." In other words, content tourism in the broader sense is no longer the minor tourism activity that it once was. At the same time, the influx of tourists from abroad provides an excellent opportunity for overseas visitors to learn more about Japan's unique culture attributes. While this involves challenges, I would still argue that content tourism could effectively bridge mutual understanding between Japan and other countries.

Content tourism has clearly entered a new phase. The fact that content tourism is no longer the minor nerd-oriented tourism activity it once was can probably be attributed to certain challenges and possibilities that have recently emerged. Certainly, "Your Name," the big hit of 2016, played a major role in the recent popularization of content tourism. More than 15 million people have seen the movie in Japan alone, so it has had a tremendous impact. Essentially, content tourism is tourism activity in which fans visit sites or places that are associated with a book or film. In other words, identification of specific places is what is important. Here we assume that the site is a fixed place such as a building or a store. But the rapid penetration of *Pokémon GO* in 2016 may necessitate a redefinition of content tourism. One could argue that this is linked to tourism activity that involves tracing the steps of celebrities or characters, a sacred place that in this case is mobile. Or if you go out into the city in search of a Pokémon character, this activity involves a whole new dimension of city walking. This new aspect of content tourism would require more space than I have available, so I will save it for another paper.

In 2016, Hosei Graduate School of Regional Policy Design (the author's school) joined forces with the University of Tokyo's Hirose-Tanikawa Research Lab and Koto City Tourism Association to develop and AR-based walking tour around Fukugawa (Koto-ku, Tokyo) that permits viewers to superimpose the current cityscape on top of the same views from 57 years ago around 1960 (see photo). While only a few people can take the tour at a time because we could only build a limited number of hand-held terminals, the participants were all quite pleased with the tour. This too should be regarded as a new dimension of content tourism.

But since this city walking tour is actually accompanied by guides, it represents a first trial demonstration. There is still much room for improvement on the implementation side, and we are now considering other walking tour destinations in addition to Fukugawa. This city walking tour also permits participants to navigate through historical fragments and explore layers in the city's history. We also intend to give participants a sense of the passage of time and experience historical changes by superimposing real-world reality over a virtual reality.

While today this can hardly be considered a truly novel approach, in terms of implementation it was quite experimental, and represents a new type of city walking tour proposal. And looking further ahead, we can envision all sorts of variations on this approach. For example, in my particular area of content tourism interest, applications are already being developed that

Figure 3: AR-based walking tour (photo by the author)

leverage AR through animation. And we needn't confine ourselves to animation, for eventually content tourism will find ways to harness books, music, and other manifestations of popular culture.

We can expect these developments to unfold in the future, but first we need to perfect plain-old AR-based city walking. There are still many enhancements to be implemented, and I would like to interview some of the participants who took part in the first experimental city walking tours. In my own mind the wheels are turning, for I am trying to come up with improvements to the Koto City walking tour. Helping people rediscover the cityscape around them is the primary objective, but if people could somehow draw inspiration from the landscape as they participate in these walks, that would be ideal.

Contemplative strolls through the city offers a way of directly communing with the cityscape. Certainly the style of interaction will change somewhat with the introduction of AR. While certainly we must continue to explore the value added pleasure of incorporating AR in city walking tours, we must also pursue case studies of other cutting-edge AR technologies as they become available. And no doubt there are other case studies in other countries that we should consider, and we must recognize that advances in civilization always preceeds in tandum with technological innovation.

3. Conclusions

There is much more to say, but I have used my allotted space, so I will conclude with a very brief recap. Although the title of the paper is "Transformation of the Philosophy of City Walking," at this point I cannot probe any deeper. Only to note that city walking can be likened to taking a miniature journey. The true baseline of a journey is the dialog one has with the landscape. For example, this involves altering your usual path through everyday life, then looking back to see what is different, what is changed. You often hear that life is like a journey, but perhaps it's more accurate to say that one's everyday existence is the journey itself. And if you make little discoveries along the way, then you are forever immune from boredom. Shuji Terayama counseled "throw away your books, and run into the streets!" No truer words were ever spoken, for urban spaces are perennially fascinating.

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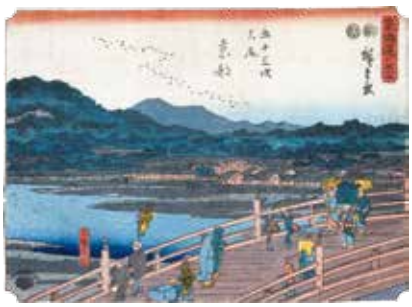
Cover Art



Tokaido gojusantsugi Taibi Kyoto Sanjo Oohashi (The Great Bridge at Sanjo (Keishi, Sanjo ohashi), from the series "Fifty-three Stations of the Tokaido)

Utagawa Hiroshige (1797-1858)
Collection of the Art Research Center
(ARC), Ritsumeikan University
Object number: arcUP2395

Geographic Information Standardization and Potential Applications in Tourism

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1. Introduction

Geographic information standards are the set of standards established for sharing geographic information, which refers to any information regarding phenomena on the earth. ISO/TC 211 began standardization activities in 1994, and has created the ISO 19100 series of standards. The author was directly involved in this standardization work for ten years starting in 1995, and since then has been a member of the Japanese domestic committee to ISO/TC 211, and also a leader of several working groups established under the domestic committee to create corresponding JIS standards. This article begins by giving an overview of geographic information standards. It then describes knowledge systems for geographic information technology, which provide background for these standards. It then proposes a tourism data infrastructure, which applies these standards to the field of tourism.

2. Geographic information standards

In this section, we discuss what geographic information standards are, how they are used, and more specifically, how they are studied and used in Japan.

2.1 Geographic information standards and their application

Geographic information standards provide a framework for creating geographic information specifications and systems that use them. The goal of this standardization activity is to enable specification of geographic information management, including definition and description; tools; services; data acquisition, analysis, search, and representation; and transmission of data among different users, systems and locations.

For example, in 2007 the European Union (EU) enacted a directive called the Infrastructure for spatial information in Europe (INSPIRE) and participating EU countries are each creating their own domestic laws for geographic information standards in conformance with this directive. It is establishing a geographic spatial data infrastructure that will enable sharing of geographic data. Today, most countries in the EU region publish spatial data conforming to this directive. The International Hydrographic Organization (IHO) has also established profiles for the ISO/TC 211 standards (S57, S100, etc.), and many countries are using product standards based on them to create global electronic navigation charts. The Open Geospatial Consortium (OGC), an NGO, is also leading the creation of many international specifications. For example, OGC has submitted a standard proposal called Geography Markup Language (GML) to ISO/TC 211, and has published specifications based on it, including City GML, for describing 3D city models and Indoor GML for describing indoor models. OGC has also published the "14-083r2 Moving Features Encoding Part I: XML Core," specification for describing the motion of objects such as people and vehicles within XML documents, based on the ISO standard for describing moving features. The project leader for this specification was Professor Ryosuke Shibasaki from The University of Tokyo.

2.2 Geographic information standards study systems

As of March 2017, there are more than 51 standards for geographic information. There are 39 voting member countries participating in creating standards, and a further 28 countries with observer status. Collaborating organizations include 25 within the ISO, 35 other international agencies, and two others. Japan has participated as a voting member since TC 211 was established in 1994. Deliberation within Japan is done under the Association of Precise Survey and Applied Technology (APA).

In Japan, a geographic information JIS standardization committee was formed under the domestic committee, to translate ISO standards as needed and to work on the JIS X 7100 Japanese industrial standards. To promote these standards, the Geospatial Information Authority of Japan (GSI) has established the Japan Profile for Geospatial Information Standard (JPGIS) for terrestrial geographic information, specifications are being created based on it for geographic information provided by government and other public agencies, and the Japan Hydrographic Association (JHA) is providing electronic navigation charts according to IHO specifications (S57, S100, etc.), which conform to geographic information standards. The Japan Institute for Promotion of Digital Economy and Community (JIPDEC) is also working to create geographic information standards in Japan, and has already created the Geographic information Place Identifier (PI) architecture, standardized as ISO 19155:2012.

3. Geographic information technology knowledge systems

Here we discuss geographic information technology, which provides background for geographic information standards, and then give an overview of related systems and the knowledge domains which are their constituents.

3.1 What is geographic information technology?

The Harmonized Model Maintenance Group (HMMG) was created within ISO/TC 211 to check the consistency and

ensure compatibility between standards systems. As such, creating a mapping between the knowledge underlying different sets of standards should make it possible to derive knowledge systems required to process geographic information related to these standards. Here, we refer to this collected knowledge as Geographic Information Technology (GIT).

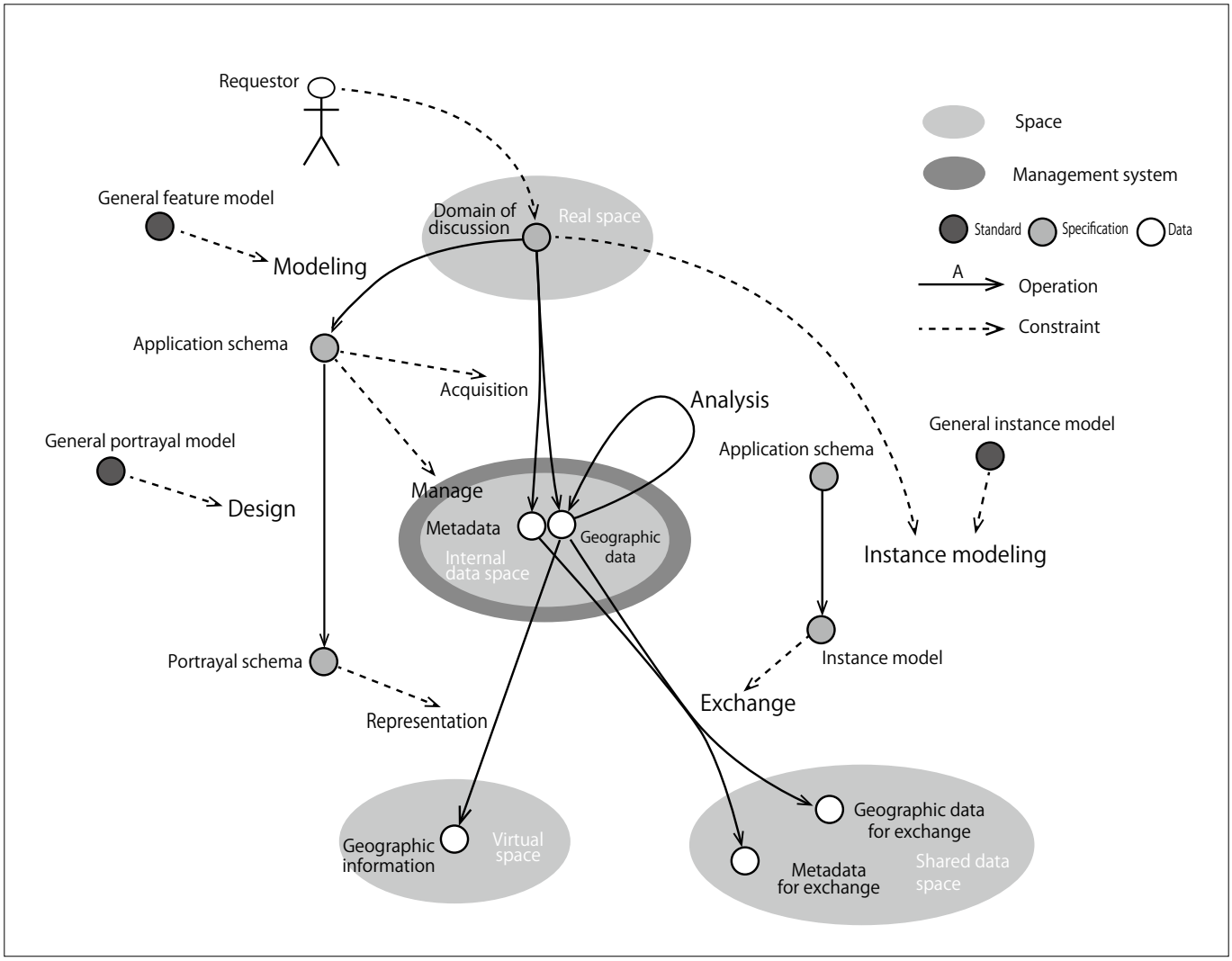
According to the Oxford English Dictionary, "knowledge" is defined as, "facts, information, and skills acquired through experience or education; the theoretical or practical understanding of a subject."

According to this definition, there are two types of knowledge, namely facts or information, and skills. These are generally called propositional and procedural knowledge respectively. Most provisions in a standard have the form "In order to A, follow a." For example, expressions such as "To encode a location in physical space, use the point as a geometric primitive," so such provisions are called propositional knowledge. On the other hand, skills required to behave according to the provisions include ability to develop and operate information systems conforming to the provisions. Both are collections of knowledge for use in society, and can be considered to be elements of GIT.

3.2 Geographic information technology knowledge systems

Information processing can be regarded as basically sequences converting input data to other data. Such sequences can be expressed as directed graphs, with nodes representing data and the knowledge required to convert it, and arcs connecting them. These directed graphs comprise systems of propositional and procedural knowledge. From this perspective, the GIT Body of knowledge, including geographic information standards, can be illustrated as shown in Figure 1. This is based on the following declaration, appearing in the scope of the geographic information

Figure 1: Knowledge systems of geographic information technology conforming to geographic information standards



standard, "The geographic information standard regulates the management, acquisition, processing, analysis, search, representation and transmission of geographic data, including its definition and description." If we consider the definition and description of geographic data as "modeling", processing and analysis as "spatial analysis", and search and transmission as "exchange", we can say the geographic information standards are based on the knowledge domains of modeling, acquisition, management, spatial analysis, exchange, and representation. These domain categories are also used as the framework for the GIS&T Body of Knowledge published by the University Consortium for Geographic Information Science (UCGIS) in the United States. As such, the geographic information technology knowledge underlying the standards can be organized by matching the knowledge domains of each of the standards. Below, we discuss the main standards and the technical knowledge underlying them for each of the knowledge domains.

3.3 Modeling

Modeling is the activity of examining objects and phenomena of interest occurring in the real world (the domain of discourse) and summarizing them in a conceptual model. To do so requires a meta-model to express the structure of the conceptual model. Within the geographic information standards, this is called the General Feature Model (GFM) and its structure is specified in ISO 19109-Rules for application schema (JIS X 7109). The conceptual models output as a result of modeling use a schema formulated for a specific field of application, so they are called application schema. City GML, mentioned earlier, is one such application schema. To understand modeling requires knowledge of a schema language for describing the model. The Unified Modeling Language (UML) is used in the geographic information standards. Knowledge of the application domain is also required in order to create an application schema.

3.4 Data acquisition

Data acquisition is the activity of observing something and creating geographic data according to an application schema. There are many ways to acquire data, such as GPS positioning, indoor positioning, photogrammetric measurements, and remote sensing. Standards directly related to data acquisition include those related to spatial reference (ISO 19111, ISO19112) and those related to data quality (ISO 19113, ISO 19114). Underlying these standards is geodetic knowledge and knowledge of statistics and error theory. Knowledge of the actual techniques used to collect the data is also necessary.

3.5 Data management

Data management is the activity of systematically storing the acquired data and providing it to users as needed. Management information technology is not necessarily specific to geographic information, but among the geographic information standards there is a metadata standard, ISO 19115-Metadata (JIS X 7115) for describing geographic information. Data search mechanisms for indexing geographic metadata are variously called geographic information clearing house, geolibrary, or geographic data catalog. Geographic extents are also used to search this data, so services displaying background maps are needed so that the location of these domains can be seen at a glance. In Japan, the Geospatial Information Authority provides its GSI Maps, which is this type of service, and there are also non-governmental organizations providing services, such as Google Maps and Open Street Map, and geographic knowledge is required to implement these services.

3.6 Data analysis

Data analysis is the process of taking input geographic data and converting it to information that is meaningful for users. This is generally called "processing", but the word processing is also used for modeling and data management, so we use "analysis" here to distinguish from these other activities. There are no geographic information standards for specifying analysis algorithms. For example, among application schema, even though the expression "shortest path" appears, specific analysis methods are implemented by the system developers. In fact, the standard notation for showing analysis as an operation within a class in a UML class diagram is an Application Programming Interface (API), according to the general object model. As such, knowledge for selecting and developing algorithms according to the requirements shown in an application schema is part of geographic information technology.

3.7 Data exchange

Data exchange is the service of sending managed geographic data to clients. A server encodes geographic data in some intermediate format according to an instance model, which is the interface, and the client decodes and uses it. In the geographic information standards, geographic data conforming to an application schema is exchanged in the form of Extensible Markup Language (XML) documents. ISO 19136-Geography markup language (GML)(JIS X 7136) has been standardized as a meta-model conforming to the general object model, to encode these XML documents, so that geographic data can be exchanged in that form. Thus, to understand this knowledge domain requires an understanding of XML, but there are also many other data formats such as JSON (ECMA 404), CSV, Shape and DXF, so knowledge is also required to convert between these formats.

3.8 Geographic information expression

Expressing geographic information is the process of taking geographic data as input and expressing it in a form that has value for the user (mapping, conversion to speech or documents, etc.). One standard for visualizing geographic data using maps is

ISO 19117:2012-Portrayal. This standard gives a general model for depicting functions and symbols, for converting geographic features into symbols to be displayed on a map (such a place-name labels). Design for expression is the process of creating a portrayal schema for the geographic information being created, according to this standard. Note that today, expression of geographic information is not limited to ordinary maps, but includes diverse means of expression such as statistical maps, interactive maps that can be searched for local attributes after specifying a location, walk-through videos, and 3D maps. As such, a more comprehensive initiative is needed to organize this knowledge and standardize these sorts of expression.

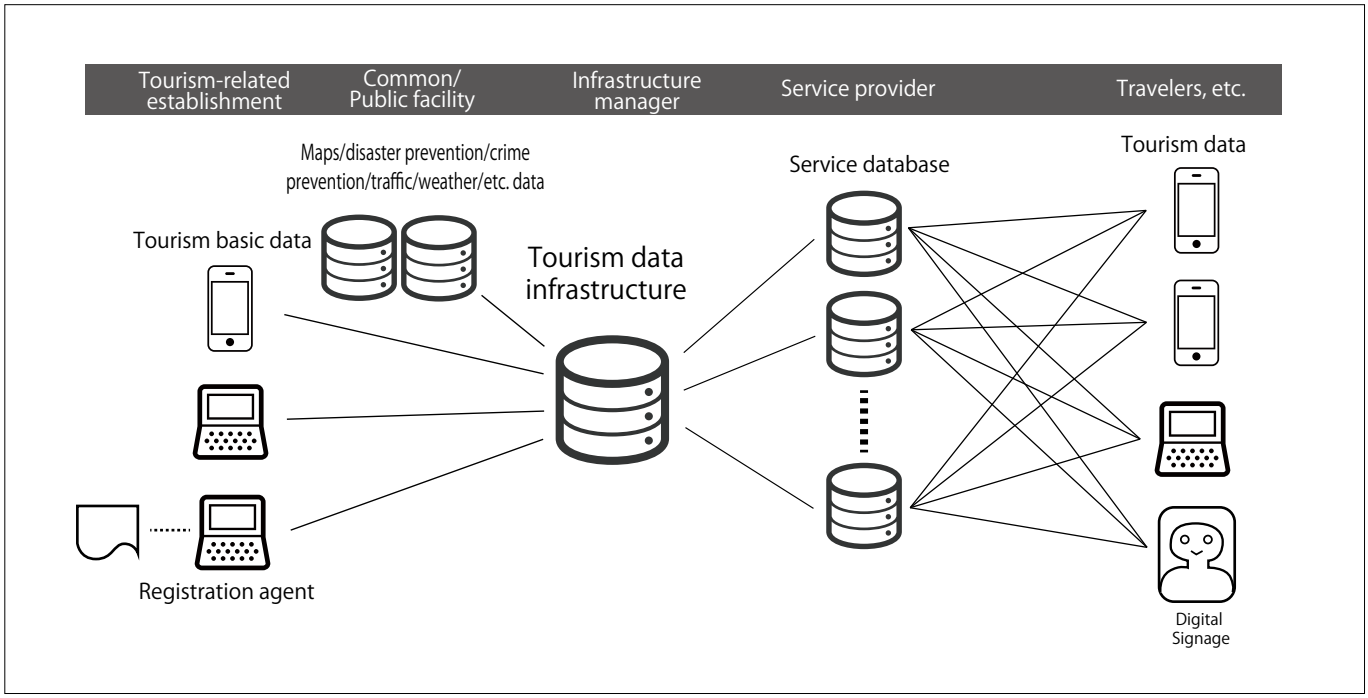
4. Potential for applications in tourism

Tourism is not the specialty of the author, so there may already be a similar service, but we propose a potential application below. There is a need for both competitiveness and collaboration in tourism information services. As an example, services for introducing and selecting tourism-related facilities would be expected to have different content depending on the nature of the site, but if information such as business hours was different, it would cause confusion for users. On the other hand, it is difficult for a touristic facility to know all of the sites that provide information about it, so when the business hours are changed, it is difficult to ensure that changes are made comprehensively on all sites. This suggests that some of this basic data that needs to be common, such as location, could be managed centrally by an intermediate organization, facilities could register their own data there, and information services could reference and provide that information to travelers or other entities that need it.

If this sort of tourism data infrastructure is to be built, it would be preferable to provide the data and APIs for manipulating it according to an international standard and in a common international format. This would enable the data infrastructure to be opened to services around the world, and not just domestically.

As shown more concretely in Figure 2, a database for the tourism data infrastructure would need to be studied, selecting data items appropriate for the common platform. The results would be shared with stakeholders, defining the scope of discussion, and agreements reached on aspects such as application schema and metadata describing data providers. Based on the agreements, data would be acquired, the database system would be developed, and the formats and service APIs for the data being provided would be published. Providers of the data registered in the tourism data infrastructure could freely update their own data, and service providers could reference the shared data and use it in providing their own services. Considering issues like the digital divide and multi-lingual data, data registration agency services would also be needed. This would enable travelers to receive personalized information services, based on data free of inconsistencies, and better services could be provided through collaboration with tourism-related agencies such as police, fire prevention, traffic management, and mapping facilities.

Figure 2: Proposed Tourism data platform organization



Report on Disaster and Crisis Management ICT Symposium 2017

Eimatsu Moriyama
Managing expert
Planning Office, Applied Electromagnetic Research Institute,
National Institute of Information and Communications Technology

On February 2, the National Institute of Information and Communications Technology (NICT) together with the ICT Forum for Security and Safety (Chairman: Prof. Hajime Fukuchi, Tokyo Metropolitan University) held the "Disaster and Crisis Management ICT Symposium 2017: Information Gathering and Distribution during Disaster," *1 at the Pacifico Yokohama Annex Hall. This symposium was positioned as a seminar in conjunction with the "21st Earthquake Countermeasures Expo Yokohama," held on the same day, to introduce ICT for realizing a safer, more secure society, and to collect ideas from the participants. This was the tenth time the symposium has been held since 2007.

The day began with greetings by Forum Chairman Prof. Hajime Fukuchi and by MIC Research Promotion Office Director Kazunori Echigo, which were followed by six lectures. It was attended by approximately 130 participants from local governments, government disaster prevention agencies, universities and disaster prevention equipment manufacturers. The theme of the symposium was "Information and communication during disaster."

Mr. Kubota's lecture featured a demonstration of VoiceTra*2 customized for emergency responders, while Mr. Miura and Mr. Uratsuka introduced some of the latest research results from NICT initiatives. All of the lectures were aimed at all attendees, and not just the technical specialists. There were many questions from the broad range of interests of attendees, such as the effects of the results, costs of deploying them, and what support structures were needed. Survey results were also positive, mentioning the broad range of lectures and easy to understand hand-outs, and many were looking forward to plans from the panel discussion.

Many people interested in earthquake countermeasures attended the Earthquake Countermeasures Expo, so it was a perfect opportunity to hold this symposium on current disaster and crisis management technology. We hope to hold this symposium, coordinating with the content of the Earthquake Countermeasures Expo, again in the future as well.

*1 Symposium Web site: http://ictfss.nict.go.jp/yokohama2017/index.html
*2 VoiceTra is a multilingual speech translation application.
Web site: http://voicetra.nict.go.jp/en/index.html

Disaster and Crisis Management ICT Symposium 2017
– Information Gathering and Distribution during Disaster –

Program

Date/Time: February 2, 2017 (Thu.) 10:30-16:00
Location: Pacifico Yokohama Annex Hall F205
Sponsors: NICT, ICT Forum for Security and Safety
Co-sponsor: Research Promotion Council of Keihanna Info-Communication Open Laboratory
MC: Prof. Nobuhiro Takahashi (ICT Forum for Security and Safety, Sensing Technology Division Chair; Nagoya University)

Time	Description
10:30	Greetings ICT Forum for Security and Safety Chairman: Hajime Fukuchi, Tokyo Metropolitan University
10:35	Guest Greeting MIC Global ICT Strategy Bureau, Technology Policy Division, Research Promotion Office Director, Kazunori Echigo
10:40	Lecture 1 "Supporting 'Reporting'" NICT Social Innovation Unit, Resilient ICT Research Center Basic Research Laboratory Senior Researcher, Masaki Shiraiwa
11:20	Lecture 2 "Multi-layered Disaster Information Distribution using Various Communication and Broadcast Media" NTT Data Corp., Second Public Sector Unit, Disaster Prevention Solutions Manager, Hiroshi Sakurauchi
(Lunch)	
13:00	Lecture 3 "Work on Radio Issues in Unmanned Aircraft Systems for use During Disasters" NICT Wireless Networks Research Center, Executive Researcher Ryu Miura
13:40	Lecture 4 "Supporting Mobility during Disasters by Integrating Diverse Data" Tohoku University Graduate School of Information Sciences Professor, Masao Kuwahara
14:20	Lecture 5 "Gathering and Distributing Information from Injured Foreigners -- A multi-lingual speech translation applet for emergency responders --" National Research Institute of Fire and Disaster Earthquake and Natural Disaster Laboratory, Director Katsuaki Kubota
(Break)	
15:15	Lecture 6 "Assessing Damage Conditions at the Kumamoto Earthquake using Airborne SAR" NICT Applied Electromagnetic Research Institute, Managing Director Seiho Uratsuka
15:55	Closing Remarks NICT, Vice President Mizuhiko Hosokawa


Prof. Takahashi MC


Chairman Fukuchi Greeting


MIC Research Promotion Director Echigo Greeting


Mr. Shiraiwa Lecture


Mr. Sakurauchi Lecture


Mr. Miura Lecture


Prof. Kuwahara Lecture


Mr. Kubota Lecture


Mr. Uratsuka Lecture


VP Hosokawa Closing


Symposium venue

= A Serial Introduction Part 1= Winners of ITU-AJ Encouragement Awards 2017

In May every year, The ITU Association of Japan (ITU-AJ) proudly presents ITU-AJ Encouragement Awards to people who have made outstanding contributions in the field of international standardization and have helped in the ongoing development of ICT.
These Awards are also an embodiment of our sincere desire to encourage further contributions from these individuals in the future.
If you happen to run into these winners at another meeting in the future, please say hello to them.
But first, as part of the introductory series of Award Winners, allow us to introduce some of those remarkable winners.

Mamoru Ishii
National Institute of Information and Communications Technology
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Fields of activity: Space weather

International Standardization of Ionospheric Propagation

It is a great honor to receive the ITU-AJ Encouragement Award. NICT has been monitoring ionospheric propagation for more than 60 years. The study of ionospheric propagation, especially long distance high-frequency propagation, has been discussed for many years and many people have believed there is nothing new to learn. However, this research field has become more popular than ever with demand to increase the utility of global navigation satellite systems (GNSS). GNSS are used in various fields and have become part of the social infrastructure, but satellite positioning using only a single frequency can be affected by ionospheric disturbances resulting in error of up to 70 m. It is important to monitor ionospheric conditions for stable use of GNSS.

As described above, GNSS using a single frequency can be affected by ionospheric perturbations, but on the other hand, it is possible to estimate the total electron content (TEC) along the path between the satellite and the receiver using a multi-frequency GNSS receiver. Using a network of special GNSS receivers, we can estimate the two-dimensional distribution of TEC. This technique has given many fruitful scientific results in ionospheric research.

For this study it was important to collect as much GNSS data as possible. However, in some cases, owners of the receivers do not like to release their data because it is considered to be a kind of social security information in some countries and regions. To avoid this issue, we proposed a new format in which precise positioning information is removed to facilitate data exchange. The format, named "GTEX," has been successfully included in ITU-R P.311.

Another topic in ionospheric propagation is long-distance low frequency (LF) propagation. LF is widely used for transmission of standard time and frequency signals for broadcasting. As the propagation distance for LF is very long, transmission power must be negotiated among neighboring countries. For this negotiation, it is important to know an estimate of LF electric field strength attenuation over long distances. NICT, has observed the electric field strength from the Shirase, an Antarctica exploration ship, to estimate an empirical propagation model along a North-South baseline. The measurement results have been used for revision of ITU-R P.684. The observed data was also added to the ITU databank in 2015.

Ionospheric information will become more important with more advanced use of these applications and we will continue efforts to contribute to the standardization of this information.

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Fields of activity: 3GPP

From HSPA and LTE/LTE – Advanced Standardization to 5G Standardization

I am extremely honored to receive this encouragement award. I would like to thank everyone at the ITU Association of Japan and all related persons. I would like to take this opportunity to review my past activities related to standardization at the 3GPP.

When I first began participating in 3GPP standardization meetings, 3GPP was studying HSPA as enhancements to the W-CDMA standard specifications, and the specifications for HSDPA on the downlink and HSUPA on the uplink were released in 2002 and 2004 respectively. I contributed to creating the HSUPA radio interface standard specification.

Later, 3GPP released the LTE and the LTE-Advanced specifications in 2007 and 2010 respectively. I also worked as an editor, implementing specifications for LTE standardization, and it was a very good experience to be involved, from basic studies for the new system, through to completing the specification. I learned the importance of having both technical and negotiation skills, in putting together a standard specification amidst various claims of each company, and in negotiation, to clearly convey my own claims while understanding the underlying intentions of others' claims.

3GPP is currently creating 5G standard specifications, with the first specification scheduled for release in December, 2017. 5G expectations are high, and there is demand to realize advanced requirements and support a wide range of use cases. I am serving as rapporteur for the group studying radio access network architecture, and will work to complete a 5G standard specification satisfying all such requirements.

Memiko Otsuki

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Fields of activity: Telecommunications Regulations, ITU-T SG3

Standing at the Starting Point
— International Standardization of Telecommunications Policies —

I am very honored to receive the ITU-AJ Encouragement Award. I would sincerely like to thank all of the people at the ITU Association of Japan and others that have supported me in these activities.

I have been involved in standardization activities, mainly in ITU-T Study Group 3, since 2009. SG3 is the only study group within ITU-T dealing with international standardization of non-technical issues. SG3's main role is to establish standards for tariffs for telecommunications, but in the past few years, research has expanded to a wide range of regulatory and policy issues related to ICT. I participated in the recent World Telecommunication Standardization Assembly (WTSA-16) as a member of the delegation of Japan and worked on many new and revised ITU-T resolutions. I also served as chairperson for drafting one of them, "Studies concerning the protection of users of telecommunication/information and communication technology services."

Reaching a consensus in negotiations among stakeholders with different interests at an international conference requires much time and patience. However, having members with totally opposite opinions gradually find compromise, and finally arrive at a unified goal to strive for is especially satisfying. Through my ongoing participation in these meetings, I've come to believe that open communication with members from the various countries, and a comprehensive understanding of their cultural and business background is very important in negotiations.

In the past, it was a goal of mine to engage in ITU activities. Now, after being involved for some time, and being impressed with the skills and character of many experts, I finally feel as though I have arrived at the starting point in this field. For the current study period in SG3, I plan to work on issues related to mobile financial services as an associate rapporteur. It will be a challenging role, but I intend to invest all of my effort so that I can continue to contribute to the development of global telecommunications.

Yuichi Kusakabe

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Fields of activity: Ultra-High Definition Television (UHDTV)

Standardization of Real-time Serial Digital Interfaces for UHDTV Signals and Image Parameter Values for High Dynamic Range Television

It is a great honor to receive the ITU Association of Japan Encouragement Award. I wish to express my deep gratitude to all those who have supported me.

Since 2014, I have taken part in meetings of ITU-R SG6 (WP6B and WP6C), and have been responsible for the standardization of real-time serial digital interfaces for ultra-high definition television (UHDTV) signals and image parameter values for high dynamic range television (HDR-TV).

The recommendation on UHDTV image parameter values (Rec. ITU-R BT.2020) was established in 2012. Shortly thereafter, the then-WP6B chairperson expressed his opinion that developing UHDTV interfaces to promote UHDTV program production was urgent. My first task was to contribute the UHDTV interface developed in Japan to ITU-R and establish it as an international standard. Two other proposals were offered from outside Japan, and the task of unifying the three proposals, each with their different features was quite difficult. Ultimately, the recommendation (Rec. ITU-R BT.2077), which includes all three proposals, was established in 2015.

The second task was to develop a recommendation for HDR-TV. The discussion was based on an American contribution that proposed a completely new transfer function, the perceptual quantization (PQ) system, for a new HDR television system. We had concerns that the proposed system was not suitable for broadcasting, while simultaneously acknowledging the advantages of the proposal. Thus, we developed another HDR system suitable for broadcasting, the Hybrid Log-Gamma (HLG) system, in cooperation with the BBC. Again, a long and tough discussion followed about how to unify the two proposals; each contributor insisted their proposal had the greatest number of advantages. The recommendation for HDR-TV image parameter values (Rec. ITU-R BT.2100) was finally agreed upon in a February 2016 meeting. UHDTV test broadcasting incorporating the HLG system was launched in August 2016 in Japan.

I have learned from these experiences that in addition to submitting technically superior proposals, negotiating and establishing trusting relationships are critical to developing standards. I am, as always, committed to standardization work and will continue to contribute to next-generation broadcasting services.

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Dear Sir/Madam,

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To be sure you will receive your kaleidoscope gift, I advise you to do the questionnaire at your earliest convenience.

Yours sincerely,

Editor of **New Breeze**
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Kaleidoscope samples

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