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Special Feature

Contributions to Society Through Human-flow Analysis

Initiatives Supporting COVID-19 Countermeasures and Contributing to Society Using Dynamic Population Analysis from Smartphone Location Data

Analyzing Population Flows Using Mobile Spatial Statistics and Contributions to Society During the COVID-19 Pandemic

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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.

Initiatives Supporting COVID-19 Countermeasures and Contributing to Society Using Dynamic Population Analysis from Smartphone Location Data

Kazuhisa Shibayama
President & CEO
AGOOP Corp.

1. About AGOOP Corp.

Agoop was established as a wholly owned subsidiary of SoftBank in 2009, as an enterprise specializing in location Big Data. We have contributed to SoftBank Mobile Corp. (now SoftBank Corp.) becoming the "No. 1 Smartphone for ease of connection" in 2012, by collecting and analyzing smartphone packet connection rate data, using GIS to identify areas with poor connectivity and helping to improve wireless service efficiently. Since 2014, we have conducted analysis using our own technology to collect location and sensor data with a smartphone application, developed dynamic population data to visualize the movements of people, and provided valuable information that brings new perspectives to business in a wide range of fields, including disaster response, tourism and marketing.

In 2018, we started a new service called "Kompreno," which provides real-time visualization of dynamic population data. This was followed by other services including the "Papilio" service in 2019, which makes it easy to know the population staying by time of day at locations such as train stations and touristic sites throughout Japan, and "Population-flow statistics reports" in 2020, which provide detailed analysis and visualizations according to customer requirements. In 2022, we also began providing "Machi Repo," which is a dynamic population marketing tool that enables free definition of areas to be investigated, so visitors to that area can be studied.

2. Initiatives supporting COVID-19 countermeasures

2.1 Overview

To support countermeasures for the COVID-19 pandemic, we have provided dynamic population analysis reports from major areas throughout Japan (major train stations, commercial and touristic areas) to government agencies (Cabinet Secretariat, MIC) local governments and the media throughout Japan since April 2020. Providing such dynamic population analysis reports to each local government and administrative agency enables them to quickly understand changes in population flow at a regional level, due to factors such as the declarations of emergency and requests for residents to constrain their movements, and has been helpful in verifying the effects of countermeasures taken and in planning further measures. By also releasing dynamic population reports to the media free-of-charge, conditions of people going out was reported daily, increasing residents' awareness of COVID-19 and contributing to suppressing spread of infection.

2.2 Features of dynamic population data

(1) Graphs of dynamic population trends in 20,000 locations throughout Japan

The dynamic population data used for COVID-19 countermeasures consisted of statistics based on smartphone

Figure 1: Major train station example (Tokyo station)

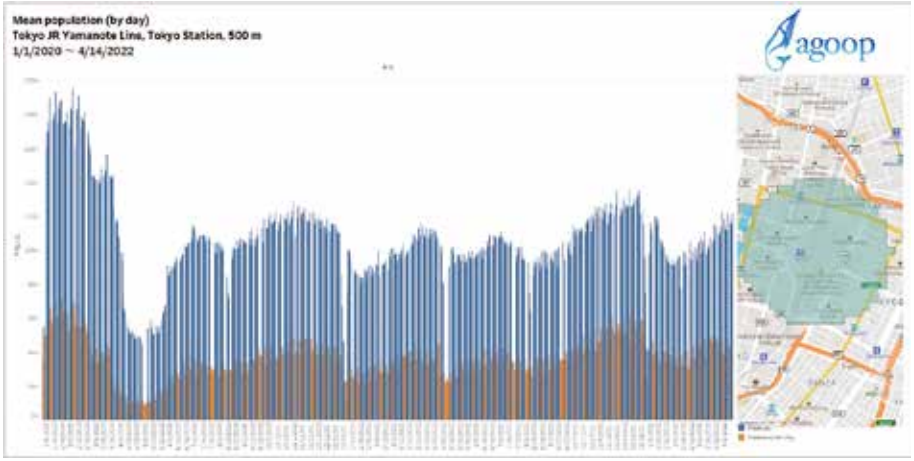


Figure 2: Major touristic/entertainment area example (Kyoto, Arashiyama)

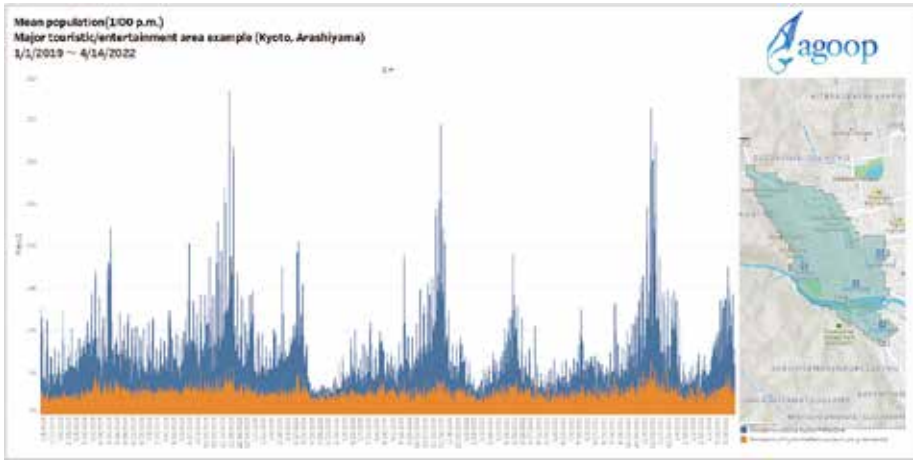
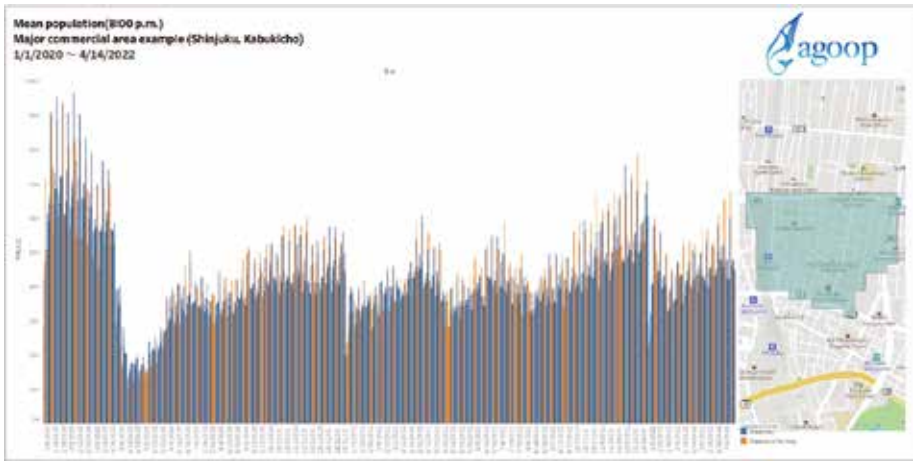


Figure 3: Major commercial area example (Shinjuku, Kabukicho)



Figures 1-3 are excerpts from "Analysis of dynamic population changes with the spread of COVID-19" on the Agoop web site (https://www.agoop.co.jp/coronavirus/)

location data, which is converted to a mesh covering the entire population of Japan. It can be used to display graphs of hourly dynamic population trends at 20,000 locations throughout Japan, such as major train stations, commercial and touristic locations, from January 2020 till the day before the service started. Dynamic population analysis reports from over 100 selected train stations, commercial and touristic locations for every day since April 2020 are summarized and published free-of-charge on our web site.

(2) Visualization of visitors' areas of residence

Visitors can be aggregated based on their area of residence (in city/town/village, in prefecture, or outside prefecture), so that population flows can be known at finer detail than the prefectural level. These can be used to show changes due to COVID-19 countermeasures or seasonal fluctuations in the in-flow to major touristic areas from other prefectures.

(3) Adjustment of areas

For major commercial and touristic areas, which cannot generally be designated with concentric circles, polygon data was prepared to define the optimized ranges for these areas. Major areas throughout Japan, such as Kabukicho (in Shinjuku, Tokyo), were defined so that they can be analyzed using optimized areas.

2.3 Issues with providing and publishing data and how it is handled

In the past, use of Big Data required data scientists because expensive analytical tools had to be purchased and were difficult to use. To actively promote utilization of data, we have moved from providing data to providing results of analysis, and attempted data-use in a wide range of fields. We have prepared population-flow trend graphs in PDF files that can be viewed easily, so that difficult tools and other systems that were required for data utilization earlier are no longer needed. We have also implemented Robotic Process Automation (RPA) for all operations in dynamic population analysis, so that information can be provided reliably

at any time, for any time period and regardless of weekday or holidays. By implementing RPA, we can provide the information needed, quickly and at low-cost, without the need to purchase expensive analytical tools or employing data scientists, and have built a new information service providing analysis reports.

2.4 Seed technologies

Seed technologies used for dynamic population analysis include a location data collection software development kit (SDK), data collection applications, a Big Data processing cloud platform, RPA implementation, data anonymization technology and data scientists.

(1) We have developed our own software for smartphone applications (an SDK) for collecting comprehensive GPS data using very low-power computation, for safe collection of GPS data that is the basis of dynamic population data, without collecting personal information from any individuals.

(2) GPS information is privacy data, so obtaining agreement from users in a form that is easy to understand is a major assumption. We also develop applications and when incorporating functions that use GPS, our applications obtain agreement to collect GPS data at the time the application is launched for the first time, before using such data.

(3) Technology for building a cloud-based processing platform to rapidly accumulate, process and analyze at high speed, the large amount of GPS data sent from user terminals.

(4) Technology for building systems that analyze and process GPS data in various ways, to generate dynamic population data and implement RPA without the need for human intervention.

(5) GPS data itself contains privacy data with potential for identifying individuals, so we have technology for anonymization, which masks information regarding individuals' range of movements (their homes, etc.).

(6) Our internal data scientists are also an important technology seed (HR), with their ability to produce analysis suitable for each objective by trial and error, and derive results that convey to correct meaning to users.

These six points are important seeds for providing value, starting with data collection and including everything from storage, processing, analysis, and report generation. In particular, the most important things when handling Big Data are not to have large amounts of data, but to have a wide range of data that can be analyzed from various perspectives, to have technology that can process and provide it quickly, and to have personnel that can perform analysis and development quickly in rapidly-changing crisis conditions.

2.5 Publishing analysis supporting economic recovery from COVID-19

We have published reports of analysis to support economic recovery after the prolonged economic suppression due to COVID-19 on our web site. With all of Japan operating in a self-restraint mode, business districts, large-scale commercial areas and touristic areas experienced dramatic decreases in visitors, and many areas suffered economic distress. We are providing evidence for solutions to this issue, with quantitative dynamic population data that shows the movements of people. These can be used for a new type of area marketing based on changes in people's movements.

Figure 4: Changes in staying population and demand as COVID-19 spread

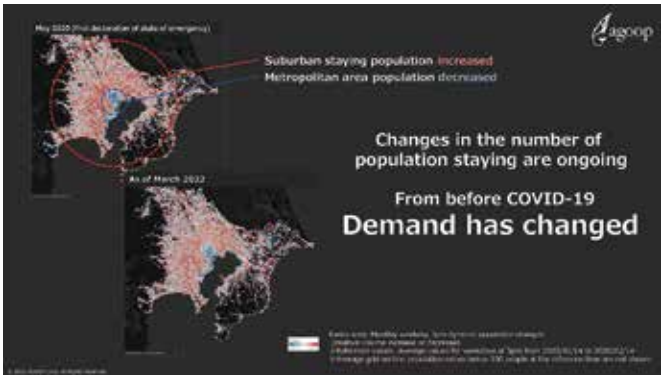
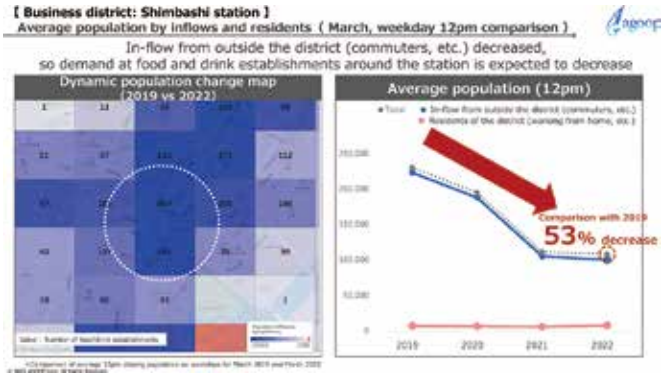


Figure 5: Shimbashi station average in-flow and resident populations



Figures 4-5 are excerpts from "Analysis supporting economic recovery" on the Agoop web site (https://www.agoop.co.jp/coronavirus/)

3. Initiatives contributing to society

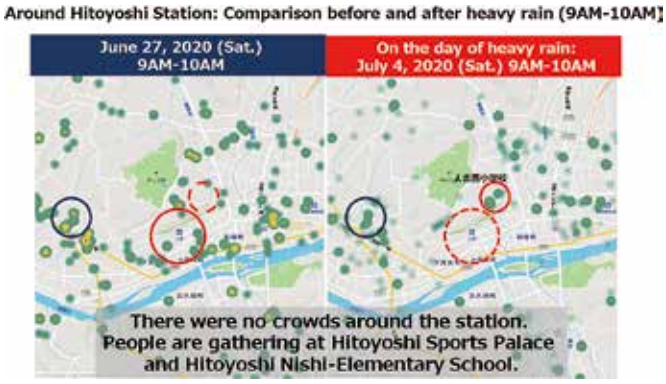
3.1 Use of dynamic population data during disaster

When heavy rains occurred beginning on July 3, 2020 in the Kyushu and Chubu regions of Japan, mainly in Kumamoto Prefecture, we published analysis of people gathering at refuge centers based on our dynamic population data, which was used for decision making in the initial stages of response to the disaster at the Japanese Red Cross Kumamoto Hospital.

Based on the analysis of evacuation conditions that we provided, the infrastructure support team, which handles improvements to the living environment at refuge shelters, decided to go to the Hitoyoshi-Kuma region for disaster response. This was one of the first cases in Japan, in which dynamic population data based on location data from smartphone applications was

used for decision making in the initial stages of disaster response.

Figure 6: Evacuation situation analysis provided to the Japanese Red Cross Kumamoto Hospital

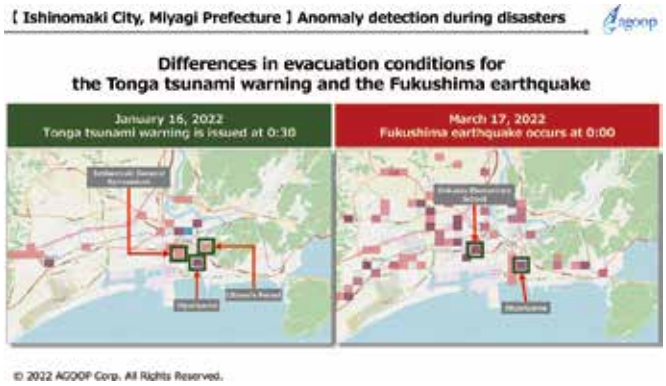


3.2 Research using AI to detect anomalies in dynamic population during disaster

In joint research with the National Research Institute for Earth Science and Disaster Resilience (NIED) (under the Public/Private R&D Investment Strategic Expansion PrograM (PRISM)), we are developing AI technology to detect anomalous increases and decreases in dynamic population. When a disaster occurs, sudden changes in population fluctuations to usual are detected as anomalies. Areas experiencing anomalies are selected by analyzing conditions 15 minutes prior. Other research is being done to support rapid initial mobilization, by quickly providing an understanding of operations at refuge centers, evacuation conditions to other locations, and other conditions such as blocked roadways, congestion at train stations that can delay evacuation.

As an example, we analyzed anomalies in Ishinomaki City, Miyagi Prefecture, during disasters. When the Tonga tsunami warning was issued on January 16, 2022, most of people did not evacuate, but after the Fukushima earthquake on March 17, 2022, people seeking refuge at refuge centers increased, showing that they were evacuating quickly. This may have been because when the Tonga tsunami warning was issued, it did not accompany an earthquake, so many people thought they would be okay without evacuating. For the Fukushima event, people felt the earthquake, resulting in mobilization of the affected people.

Figure 7: Difference in evacuation conditions in Ishinomaki City, Miyagi Prefecture disasters, detecting anomalies for the Tonga Tsunami warning and the Fukushima earthquake

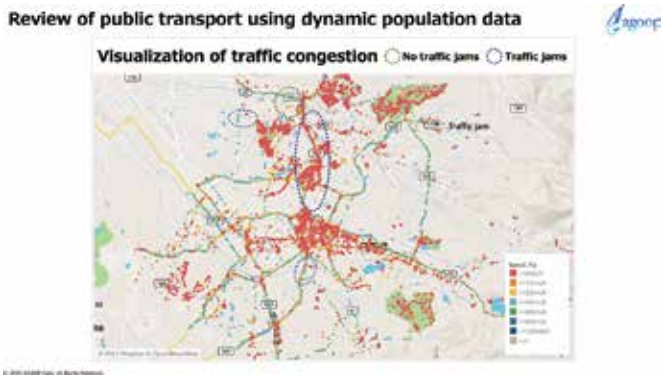


3.3 Carbon-neutral initiatives using dynamic population data

As a company facing the challenge of creating new value in the world with technology, we are all working together to solve problems for people and society and to contribute to SDGs that will realize a sustainable society. As such, we have set as our vision, to "Create mechanisms that bring happiness to people and society." One of the many problems facing society that we have chosen to prioritize is achieving carbon neutrality.

In urban and touristic areas that do not have much public transport, congestion occurs because tourists use rental cars and commuters use their own vehicles, and chronic congestion results in increased CO_2 emissions. To reduce CO_2 emissions, private vehicles need to be replaced with EVs and the environment must be reorganized to make transport easier, without being dependent on private vehicles. To study new means of mobility that will reduce CO_2 emissions, we are using dynamic population data on commuting to work and school as evidence supporting proposed improvement measures. By reexamining and studying public transportation using dynamic population data as an index, we hope to contribute to maintaining safe and secure lifestyles for people, with cooperation of regions and companies on measures such as changing modes of transport or staggering work hours based on data.

Figure 8: Reviewing public transportation using dynamic population data



Analyzing Population Flows Using Mobile Spatial Statistics and Contributions to Society During the COVID-19 Pandemic

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1. Introduction

It has been approximately two years since the novel corona virus (COVID-19) began to spread, drastically changing the patterns of our lifestyles and activities. As variants more infectious than before raged around the world, the citizens of Japan, together with government and private enterprise mounted their response. Although the rates of serious cases are decreasing as vaccination rates increase, it is still not clear how infection rates could change in the future.

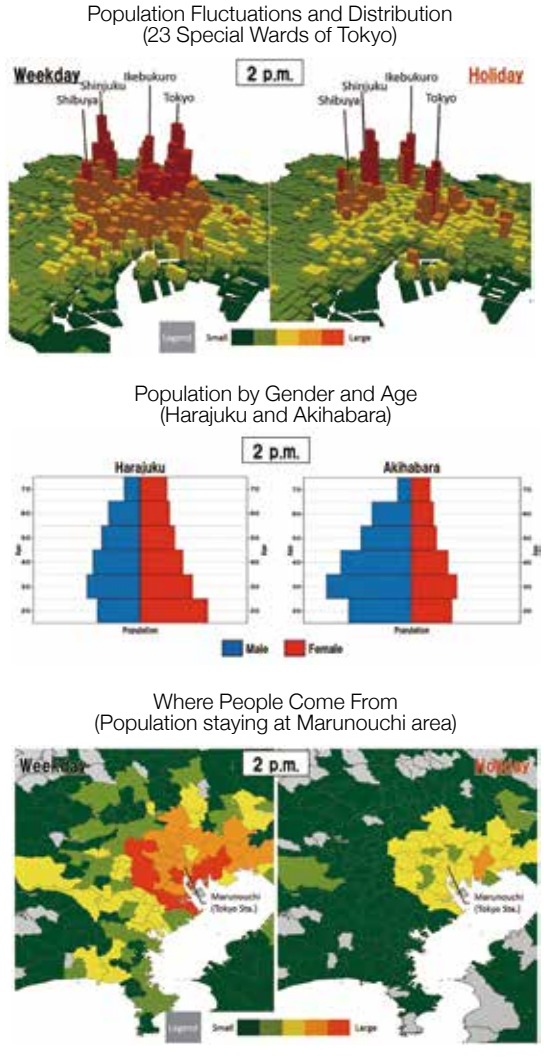
Understanding movement in the population and adopting measures such as the "Three Cs" to reduce spread were important social efforts to limit expansion of COVID-19. As one tool to address such issues, Big Data techniques utilizing location data from mobile devices have attracted much attention. Typical examples of this are the population maps utilizing Mobile Spatial Statistics (MSS). This service provides real-time knowledge of fluctuations in population throughout Japan, and by comparing with results from the previous year; it can provide an understanding of changes in population flows. As an initial use of this service, the Cabinet Secretariat and public organizations in Tokyo and other regions are using MSS to propose policies to counter the spread of infection and to measure the effects of such measures. It has also been used in research to elucidate the relationship between spread of infection and population flows, contributing to society daily.

Section 2 of this article gives an overview of MSS, and Section 3 shows the important role it plays in society, in measures taken to counter the spread of infection. Section 4 describes how it is being used actively to research population flows related to COVID-19, together with some concrete examples. Finally, Section 5 describes how MSS employs differential privacy to ensure robust privacy protection.

2. Overview of MSS

MSS provides statistical data of the population in all areas of Japan, hourly, 24-hours-a-day and 365-days-a-year, based on data from phones and other mobile devices operating on NTT DOCOMO's network (Figure 1). The statistics are computed

Figure 1: Overview of MSS



using a very large sample encompassing the approximately 82 million devices of Japan residents and 12 million belonging to foreigners visiting Japan, generating results that are highly-reliable statistically. For Japan residents, population estimates by attributes such as sex, age-bracket and area of residence can also be computed based on mobile phone subscriber information. Statistics are available geographically on a 500 m mesh covering the entire country*, in age brackets down to five-year increments, and by residential area down to villages. In each base-station area, the mobile devices being served are reported periodically, and based on aggregate numbers of mobile devices; estimates are made taking the market-share of NTT DOCOMO mobile phones into consideration.

One of the most important characteristics of MSS is that data is maintained over a long period of time. Data has been accumulated since services for residents of Japan began in October, 2013, so comparisons with past data can be done. A second characteristic is that data is very fresh. The real-time version of domestic population statistics can provide data as recent as one hour old, which is near-real-time, so it was used to understand population flows during recent measures taken for COVID-19, which changed greatly from day-to-day.

MSS are generated in three processing steps. The first step is "de-identification," which converts mobile phone data to a form from which individuals cannot be identified. The second step is "aggregation," which computes total numbers of phones according to various attributes and then increases the values according to the market-share of NTT DOCOMO to create results that also consider the population that are not NTT DOCOMO users, and the third step is "anonymization," which removes values for areas that have very few people. Thus, personal information and privacy are protected by using statistical processing so that individuals cannot be identified. A conference on "Development of Society and Industry using MSS," was held by experts and guidelines for public and industry use were published, and since the service began in 2013, it has been used in many fields, both government and private, while also ensuring protection of privacy.

For the real-time domestic population distribution statistics currently being used the most for COVID-19 related population flow analysis, "differential privacy" has been used, which is discussed in Section 5.

3. Infectious disease countermeasures using MSS

As mentioned in Section 1, the strong threat of COVID-19 resulted in a social demand to restrict the movement of people. Then, in May 2020, MSS began publishing data on a web site in the form of population maps. The population maps showed heat maps of population in real time on a 500 m mesh covering the entire country. These could be used for various purposes such as checking conditions in congested areas, requesting residents not to leave their areas, or verifying the effects of measures taken (Figure 2). MSS were also used on the Cabinet Secretariat's "Novel Corona Virus Infection Countermeasures" dedicated web site[1]. The site was established to understand population flows for avoiding the Three Cs, and to measure the effects of infection countermeasures. When it was first published, it provided a way to check the ratios of population increase or decrease relative to the population at a reference point in time, the day before or before the state of emergency was declared. It provided comparisons of populations at around 3 pm in representative locations in each prefecture, such as around the Sapporo train station, in Shinjuku, and the Shibuya Center shopping area. As of May 2022, it displays graphs of one-year population increases and decreases for every day, using the peak values for each time period in all of 2019 as the basis (1.0), and for major locations and entertainment areas in every prefecture (Figure 3).

MSS are provided to the national government as well as the Tokyo metropolitan government and other regional public organizations. For example, in Tokyo the state of congestion in major commercial areas such as Shibuya, Shinjuku and Ginza

Figure 2: Population map

Figure 3: Graph of population rates of fluctuation in major locations and entertainment districts, posted on the Cabinet Secretariat web page

* Some areas are covered with a 125 m mesh, and others are covered with a 250 m mesh.

was represented with pictograms and used to warn and encourage citizens to avoid the Three Cs[2].

Previously, MSS has been widely used for purposes such as disaster-prevention planning, community building efforts, and tourism promotion, but in this case it was used broadly for COVID-19 as an index of levels of congestion in public areas, to avoid the Three Cs, thereby contributing to society with measures to reduce movement of people and spread of infection.

4. Population-flow research using MSS

MSS are generated for events like COVID-19 that have had a major effect on society, and have been extremely useful for understanding macro-level changes in population flows. There has been much research using this data, and it has elucidated the relationships between COVID-19, related policies, and population flows, with resulting contributions to society.

Measures to suppress movement of the population, especially during the first declaration of a state of emergency in 2020, had a huge effect on people's movements, and MSS showed this clearly. ARIMURA et al. used MSS to analyze changes in population density in Sapporo after the first declaration of a state of emergency in Japan. Their results showed that during that period, the number of people staying home increased, those travelling to the center of town decreased, and this resulted in decreases of up to 90% in the population density in normally-congested areas[3].

Analysis using MSS has also been used to show behavioral characteristics of Japanese citizens. HARA et al. showed that during COVID-19, people were refrained from taking vacations or traveling between prefectures, even without strong government regulation, resulting in reduced population density in areas that are usually crowded. They also suggested that, based on this, the return of population flows was gradual after the state of emergency was rescinded [4]. KAJITANI et al. also conducted analysis in eight prefectures where infection rates increased, showing a correlation between rates of mobility and infection risk. They also combined this with business data, showing a correlation between potential for contact in each business type and the effective reproduction number [5].

There has also been research comparing the effects of the multiple declarations of a state of emergency. TSUBOI et al. analyzed population flows under two declarations of emergency, using MSS to show that suppression of population flow was smaller during the second declaration than it was during the first declaration[6].

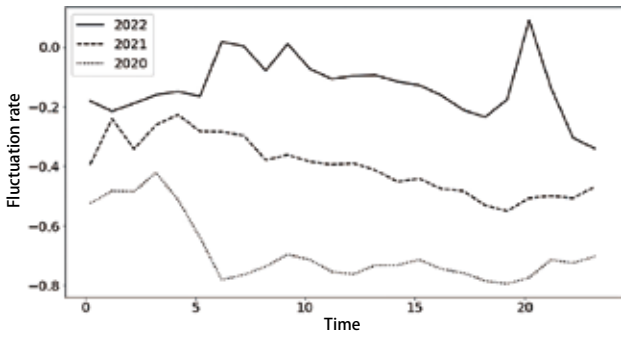
Note that statistical data such as MSS, based on base station positioning, is superior to point-based population-flow data such as GPS, for understanding macro-level behavior [7]. With GPS, the sample only includes users of the application, producing biases by region and other attributes, but MSS is able to obtain data from base stations deployed throughout Japan and makes estimates using NTT DOCOMO's large-scale sample data, so it can produce more-reliable population statistics data.

Finally, MSS was used to observe people's activities during Golden Week (GW) in 2022, compared with prior years. For the five-day period starting April 29, which is Showa Day, the population in the area surrounding Haneda Airport was compared for 2019 (before COVID-19) and the following years (during COVID-19). The conditions for the computations are shown in the table. The populations for each year were represented by peak population values in each hour of the day during the five days of each GW, and rates of increase or decrease were evaluated relative to the peak values at each time in 2019. Results of the computations are shown in Fig. 4. The solid line is for 2022, the dashed line is for 2021, and the dotted line is for 2020, showing rates of increase or decrease each year. 2020 was during the first declaration of a state of emergency, with daytime populations greatly reduced by up to almost 80%. 2021 was also under a state of emergency, but it was the third such declaration, and reductions were not as great as in 2020. Compared with before COVID-19, daytime population was down almost 40%, indicating that people were restraining themselves from taking vacations. Then, during GW in 2022, with widespread vaccinations and removal of restrictions on movement, daytime populations were only reduced by at most approximately 20%. For the time periods around 8 am

Table: Computation conditions

Item	Description
Reference year	2019
Comparison years	2020, 2021, 2022
Time period	Five days starting Apr. 29 in each year
Area covered	A 500 m mesh surrounding Haneda Airport Totals: 53392652, 53392653, 53392662, 53392663

Figure 4: Fluctuation rate trends by comparing peak values



and 8 pm, when many people go out or arrive home, the rates had almost completely recovered. Using MSS in this way, to show statistically how movement of people changes from one hour to the next, is an extremely powerful technique.

5. MSS and protecting privacy

NTT DOCOMO considers protection of user privacy to be of the utmost importance, and has published guidelines to be observed in the production and provision of MSS. MSS are strictly population statistical data and do not provide any information that can be related to individual people. For this reason, information that can identify individuals, such as phone numbers, are not used. Information is also summarized in creating statistics, such as by converting birthdays into age brackets, and addresses into cities and towns. However, summarizing information and creating statistics cannot guarantee that customer privacy is 100% protected. For example, if an attacker knows that there is only one 15-year-old female in a given region, there is potential to discover that female's activity from the real-time version of the domestic population distribution statistics. In this way, there is a danger that existing privacy protection techniques may not cover cases such as when an attacker has access to background information, or a new method of attack is discovered.

To address such issues, NTT DOCOMO has focused attention on a technique called differential privacy[8] which was proposed in 2006. Differential privacy is a technology that is being implemented by Google and Apple, and is also reported to have been used for the 2020 USA national census[9]. In simple terms, a small amount of noise is added to statistical data to satisfy differential privacy criteria. An important feature of differential privacy, in contrast to conventional privacy protection criteria such as the k-anonymity[10], is that the safety of privacy can be guaranteed mathematically. Safety from an attacker with any background information or a new method of attack is given mathematically, which may provide a way to avoid the cat-and-mouse game with respect to privacy protection.

NTT DOCOMO is continuing to study ways to apply differential privacy to large-scale geo-spatial data[11], and using them for privacy protection in the real-time version of domestic population-distribution statistics. This enables us to provide statistical information with levels of both safety and usefulness that are difficult to achieve with simple statistics or conventional privacy protection technologies.

6. Conclusion

This article has described examples of analyzing population flows and their contribution to society, particularly during the COVID-19 pandemic, using MSS, which estimates populations based on mobile phone and other mobile device data from base-stations. Although the situation is improving with increasing vaccination rates, the effects of COVID-19 on society in the future are still not clear, and statistical data on population remains an important tool for refining countermeasures. We hope that MSS will continue to play a role in society, increasing safety for residents of Japan and helping with development of society and industry.

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Cover Art

Naruto Whirlpool, Awa Province, from Famous Views of the 60 Provinces

Utagawa Hiroshige (1797-1858)

Source: National Diet Library, NDL Image Bank (https://rnavi.ndl.go.jp/imagebank/)

APT Training 2022

— Developing fundamental network planning skills in regional communities to bridge the digital divide —

The ITU Association of Japan
International Cooperation Department

Since FY2017, the ITU Association of Japan has been conducting courses to eliminate information disparity between urban areas and communities in depopulated area of developing countries as part of a program*1 to support training of human resources in the Asia-Pacific Telecommunity (APT). The objective of the training is to build skills enabling people to analyze communication network conditions in their own countries, to decide on measures to solve problems, and to do overall communication network design as a way to solve problems.

In FY2022, over an eight-day schedule*2 from November 28 to December 8, courses were held fully online, continuing the pattern from last year and the year prior. Considering the difficulty of maintaining concentration when taking online courses, classes were kept short, to about two or three hours per day. This year, 20 students participated, which is more than previous years. With cooperation from the APT secretariat, students were recruited with a target of 20 applications. A total of 19*3 diverse applicants participated from 11 countries including Afghanistan, Cambodia, China, Mongolia, Myanmar, Nepal, Palau, Samoa, Solomon Islands, Bhutan, and Sri Lanka.

The three objectives of the training program were as follows.

(1) To understand any issues with the communications networks in your own country, and to learn methods for proposing concrete plans to overcome the digital divide between regions in the country.
(2) To understand the importance of government having clear policies regarding construction of networks.
(3) To acquire skills for proposing and evaluating solutions to various issues on your own country, through lectures and presentations.

On the first day of the course, Secretary General of The ITU Association of Japan Kazuhiko TANAKA gave a presentation on the current state of ICT in Japan. There was also a lecture on basic network design concepts, given by Takayoshi HAMANO, who started as a lecturer last year and previously worked at Nippon Telegraph and Telephone Corporation (NTT).

On the second day, each participant gave a presentation based on a pre-compiled country report, summarizing the current state of ICT and related issues in their country or particular regions within their country. After the presentations, there was a time for exchanging ideas on the presentations, providing an opportunity for participants to gain a deeper understanding of conditions in other countries. The instructor, Mr. HAMANO, also described activities for the following three days, conducting drills that are a major feature of the training course.

Days three to five were for practicing various drills. Each day, participants would work intently on a particular drill, learning communication network design methods in three types of drill. For each drill, a model of a typical remote area such as in the mountains would be presented, and participants would analyze geographic and other conditions, and study network design methods suitable for such a region, and ways to organize ICT services and environments needed in the region.

Day six was set aside for discussion

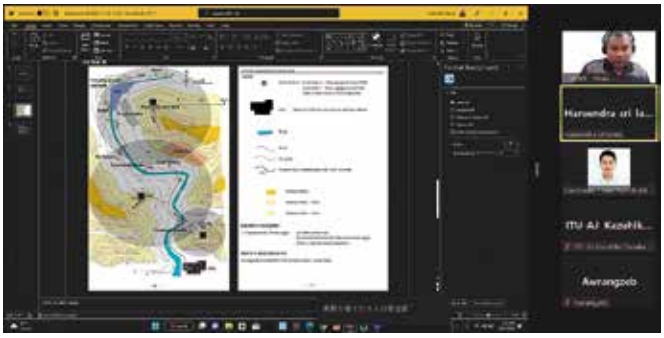
Meeting screen shot

Presentation of a country report

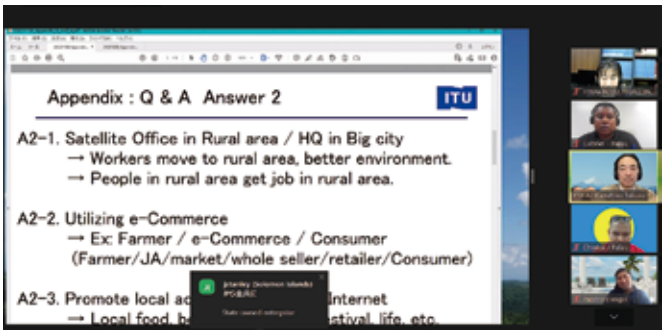
*1 A training program to convey Japanese technologies and services to communications technologists and government-related people in APT member countries, using funding contributed by the Japanese government.
*2 A one-day break during the week has been added.
*3 Due to circumstances, one of the applicants was unable to participate.

Drill group discussion

Drill group discussion



Free discussion screen shot



on a free theme. The discussion theme was ultimately decided according to participants' progress in the course. In this instance, the instructors gave detailed explanations for questions from participants that arose during the drills, and then further discussion was held regarding those responses.

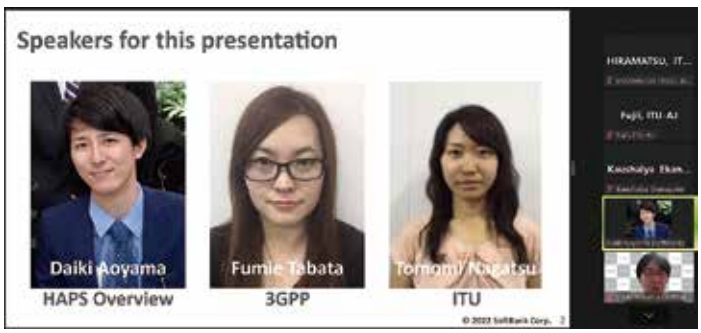
On day seven three lecturers from SoftBank Corp. gave lectures on themes related to HAPS (High Altitude Platform Station). The lectures included an overview of HAPS and related initiatives at SoftBank, as well as standardization activities for HAPS at WRC-23 (World Radiocommunication Conference 2023) and 3GPP (3rd Generation Partnership Project). During the lectures, many questions were submitted through chat, leading to a lively discussion, so it seems that the topic was very interesting for the participants.

On the final day, each of the participants reported on their action plan. The action plans consisted of a proposal for how the participants could apply the skills they had learned in the course to solve a problem in their own country. After each participant's presentation, there was an exchange of ideas regarding the presentation, mainly with the instructor. The idea here was that participants would be able to learn more practical approaches by working on problems closer to their own situation. We expect that this series of experiences will certainly be useful in participants' work in the future.

This was the third time that drills were done in the online course. The course style focused on drills can encourage independence in participants, and promote communication between them. However, performing drill repeatedly can tend to reduce participants' desire to participate, so last year we reduced the number of drills by one, to three. On the other hand, we attempted a new activity by having a day to hold discussion with everyone based on the participants' progress. By having this day of open discussion, we provided an opportunity for participants that did not obtain adequate understanding in the drills to catch up on the material.

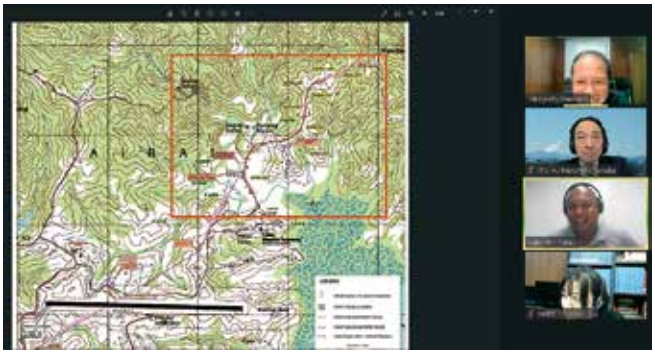
For the drill discussions, we used the "break room" feature of the Zoom web meeting tool, dividing participants into small groups. On the first day, discussions in some groups were more active than others, but the instructors worked to stimulate discussion by giving comments and suggestions to groups that were stuck. For each of the three times drills were done, the group members were switched around. This served to reduce this variation in discussion among the groups and also

SoftBank lecturers

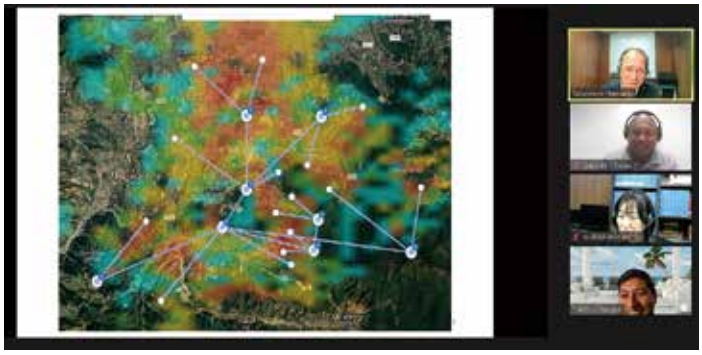


Many questions submitted to the chat during a lecture

Presentation of an action plan



Asking questions regarding an action plan



encouraged more interaction among the participants. This may have contributed to the fact that after the course was completed, members wanted to continue the interaction and the participants and instructors shared email addresses with each other.

Each time after group discussions ended, we asked a representative from each group to present the group's results, and the instructor evaluated their design draft, and gave suggestions such as possible alternative methods. Having a representative present the group's ideas also provided an opportunity for them to understand the drill content better.

Having participants present an action plan was a valuable opportunity for them to output the results of their training. Because of this, we allocated plenty of time for them to create their plan during this course, and scheduled a day without training before the presentation day. On the action-plan presentation day, the instructor gave suggestions suited to each individual proposal after the presentations, which was a good opportunity for participants to get more concrete information related to their own particular issues.

A new feature we tried this time was that almost every day after training finished, we provided an opportunity for participants to check any questions they had from the day's content with the instructors, and encouraged participants to interact with each other during an online free-communication time. We used a communication tool called GatherTown, providing a virtual meeting place environment that enables participants to move around virtually and have either group or one-to-one conversations. No particular theme was set, and members could participate freely, enabling participants and instructors to form deeper friendships.

To make it easier for a broader range of people to participate, this time we reduced the amount of self-study required before the training, and only had participants submit a country report before the training started. This may have contributed to the fact that we were able to attract 19 participants from 11 countries, and provide a good opportunity for discussion that overcame differences in nationality and types of skills. On the other hand, we also had greater differences in attendance rates, possibly because of the wider range of skill levels than previous courses. By having a day for open discussion, we were able to compensate for skill gaps to some extent, but this issue will require further consideration in the future.

As mentioned earlier, this course was held fully online, but by utilizing know-how gained in previous courses, we feel that we were able to deliver a richer course that earlier.

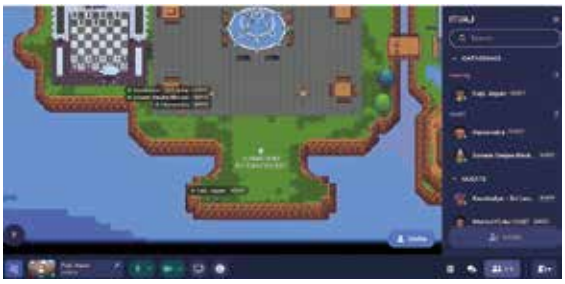
The online course has been offered three times since the year before last, and we have gained much knowledge regarding online training. We also felt a real disparity among the network environments in the various countries, so we hope for technical improvement in the future, but also will continue considering how online training should be done in the future.

We do not think there will be large changes in basic concepts of designing and building communication networks, but there have been considerable advances in communication technology recently, so the content of the drills will need to be reviewed, and we are studying ways to make the training more worthwhile.

Responses to the COVID-19 pandemic have changed greatly around the world recently, and Japan's border control measures have also relaxed greatly. It will still depend on conditions, but we hope to invite participants to come to Japan the next time we conduct this training.

Finally, we would like to express sincere thanks to everyone at the APT and MIC for their direction and cooperation in offering this training, to Instructor HAMANO for his efforts preparing materials and guiding the participants, and to everyone at SoftBank who presented lectures.

Gathering using GatherTown



55th Celebration of World Telecommunication and Information Society Day

The ITU Association of Japan
Planning Department

On May 17, 2023 the "55th Celebration of World Telecommunication and Information Society Day" was held by the ITU Association of Japan (ITU-AJ) at the Keio Plaza Hotel in Nishi-Shinjuku (Shinjuku-ward, Tokyo), attended by approximately 120 people associated with the Japanese Government and the telecommunications and broadcasting industries. Video excerpts from the ceremony are also published on YouTube.

Considering conditions with the spread of COVID-19, the event was somewhat larger than last year, and included a celebration reception for the first time in four years.

The ceremony featured congratulatory addresses from Mr. Hiroshi Yoshida, Vice-Minister for Policy Coordination at the Ministry of Internal Affairs and Communications, and Mr. Takeshi Akahori, Ambassador, Assistant Minister, Director-General for Global Issues at the Ministry of Foreign Affairs. A video message from Ms. Doreen Bogdan-Martin, who assumed the office of Secretary General of the ITU in January this year, made the event even more distinguished. This was followed by a report from Dr. Hideyuki Tokuda, Chair of the ITU-AJ Award Selection Board, of their selections this year.

The MIC Minister's Award was presented to Mr. Yoshio Miyadera, of Japan Radio Co., Ltd., who has made great contributions over many years, promoting and driving standardization of maritime radiocommunication technologies at international organizations such as the ITU and IMO, defining recommendations that reflect the latest technologies and frequency-utilization in Japan. The ITU-AJ Special Achievement Award was presented to the Starlink Team from SpaceX, for their contributions to eliminating the digital divide and providing critical telecommunications networks to areas that are dangerous or afflicted by natural disaster, with the world's first low-orbit satellite constellation providing high-speed, low-latency internet access.

ITU-AJ Accomplishment Awards were presented to 14 individuals and one organization and ITU-AJ Encouragement awards were presented to 15 individuals and one organization. These awards recognize the recipients' achievements in international activities related to information, communications and broadcasting, including contributions to ITU activities and activities in Japan related to the ITU, contributions to implementing the basic declaration and action plan for the World Summit on the Information Society, and contributions to international cooperation activities in the fields of telecommunications, broadcasting or the post.

After the ceremony, Ms. Lauren Dreyer, who received the Special Achievement Award on behalf of SpaceX Corp., gave an anniversary keynote presentation titled, "Starlink by SpaceX: Expanding boundaries, both epic and every day."

Photos from the ceremony are posted on the ITU-AJ web site (https://www.ituaj.jp/?page_id=29491, Japanese only).

From the right: Mr. Yoshida, Ministry of Internal Affairs and Communications; Mr. Akahori, Ministry of Foreign Affairs; Mr. Yamakawa, President of ITU-AJ; Mr. Tokuda, Chair of the ITU-AJ Award Selection Board

Commemorative group photo

MIC Minister's Award recipient: Mr. Yoshio Miyadera, Japan Radio

ITU-AJ Special Achievement Award recipient: The Starlink team, SpaceX

ITU-AJ Accomplishment Award recipients

ITU-AJ Encouragement Award recipients

List of the Award Recipients

MIC Minister's Award

Mr. MIYADERA Yoshio (Japan Radio Co., Ltd.)

ITU-AJ Special Achievement Award

Starlink team (SpaceX)

ITU-AJ Accomplishment Awards

Mr. ITO Yukio (NEC Corporation)
Dr. OTANI Tomohiro (KDDI Corporation)
Ms. OTSUKI Memiko (NTT DOCOMO, Inc.)
Dr. OODE Satoshi (Japan Broadcasting Corporation)
Prof. KAWANISHI Tetsuya (Waseda University)
Mr. KII Kango (BHN Association)
Dr. GUPTA Gyaneshwar Chandra (Oki Electric Industry Co., Ltd)
Mr. KOBAYASHI Satoshi
Mr. SHIBATA Tatsuo (Japan Cable Laboratories)
Dr. TAKAYA Kazuhiro (NIPPON TELEGRAPH AND TELEPHONE CORPORATION)
Prof. TSUZUKU Aiichirou (MEIJO UNIVERSITY)
Mr. NAGAE Yasuyuki (NTT e-Asia Corporation)
Mr. MIYAZAKI Makoto (Miyazaki Company Asia)
Mr. YAMAZAKI Takahiko (Mitsubishi Electric Corporation)
ITU Election Campaign Team (NIPPON TELEGRAPH AND TELEPHONE CORPORATION)

ITU-AJ Encouragement Awards

Mr. ANDO Kei (NTT DOCOMO, INC.)
Mr. IWASHITA Hidenori (NIPPON TELEGRAPH AND TELEPHONE CORPORATION)
Dr. KITO Chihiro (NIPPON TELEGRAPH AND TELEPHONE CORPORATION)
Mr. SATO Akihiko (Japan Broadcasting Corporation)
Mr. SHOJI Akihiro
Dr. SUZUKI Masaki (KDDI Research, Inc.)
Mr. SUZUKI Yuji (NTT DOCOMO, Inc.)
Mr. TACHIKI Masayoshi (NTT DOCOMO, INC.)
Dr. TANAKA Kazuki (KDDI Research, Inc.)
Mr. NAKAKITA Masamune (NIPPON TELEGRAPH AND TELEPHONE EAST CORPORATION)
Mr. MATSUMURA Yuki (NTT DOCOMO, INC.)
Mr. MIYAMOTO Hajime (KDDI Corporation)
Mr. YAMAGUCHI Satoshi (Fujitsu Limited)
Mr. YURUGI Toshikazu (KDDI Foundation)
Mr. WAMI Soichiro (NIPPON TELEGRAPH AND TELEPHONE EAST CORPORATION)
NICT Space-Time Standards Laboratory Standardization Team (National Institute of Information and Communications Technology)

通巻百三十九号

The ITU Association of Japan

定価　一冊　一、六五〇円（本体価格　一、五〇〇円、消費税　一五〇円）　年間購読料　六、六〇〇円（本体価格　六、〇〇〇円、消費税　六〇〇円）