

Smart City Guidebook

Cabinet Office

Ministry of Internal Affairs and Communications

Ministry of Economy, Trade and Industry

Ministry of Land, Infrastructure, Transport and Tourism

Smart City Public-Private Partnership Platform Secretariat

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Separate Volumes

- 1. Main Services Introduced Through Smart City
- 2. Policies / Reference Materials Related to Smart City
- 3. Glossary

Objective of This Guidebook

In order to support smart city initiatives by local governments, councils etc., we have compiled information, including the significance of / need for smart city, effects of its introduction and ways to proceed it, into this Guidebook on the basis of the successful / unsuccessful experiences of regions that have already embarked on smart city projects.

We hope that this will serve as an introduction that provides the knowledge and awareness of smart city initiatives for people, including heads / staff members of local governments, who are interested in smart city but hesitant about starting it by saying, 'What is smart city? What effects does it have' or 'What should I start with?'.

Intended Readers of This Guidebook

This Guidebook is primarily intended for heads / staff members of local governments that are going to embark on smart city initiatives, but also for personnel at private companies, universities etc. that can be local governments' partners.

Structure of This Guidebook

- **Chapter 1** provides an outline of smart city, including its significance, objectives and basic philosophies.
 - The separate volume 'Services provided through smart city' lists examples of services provided for each area. Referring to this while reading Chapter 1 will help you understand what are achieved through Smart Cities in each city / region.
- **Chapter 2** provides procedures / processes for implementing smart city initiatives for each stage, and summarizes key challenges.
 - Chapter 2 comprehensively describes 'ideal procedures' in a sense. Depending on the situation surrounding each region, the approach of starting with what you can do, instead of doing all the matters described, will also be effective.

STEP 1

For those with the question: 'What is Smart City?'

Chapter 1 Basic Concept of Smart City -> p. 4

The definition and effects of smart city as well as the concept of smart city initiatives are described.

Separate Volume: Services Provided Through smart city -> Separate Volume ①

Examples of smart city projects across the country are provided for each project area. Find out examples that you would like to follow in your town.

STEP 2

For those with the question: 'I am interested in smart city but what should I start with?'

Chapter 2 1.How to Proceed with Smart City -> p. 19

Procedures / processes for considering actual smart city projects are provided along with examples of actual projects.

STEP 3

For those with the concern: 'I am proceeding with smart city but have problems.'

Chapter 2 2 Key Points in Proceeding with Smart City and Ways to Address Them -> p. 45

Concerning major challenges in proceeding with smart city (i.e. driving structure, financial sustainability, public participation, introduction of data platform and KPI), key points to address those challenges are described along with examples of projects.

Chapter 1

Basic Concept of Smart City

1-1 Significance of / Need for Smart City Initiatives

1-1 Significance of / Need for Smart City Initiatives

- We understand that cities / regions in Japan are pursuing the creation of attractive communities where their residents (visitors) can work, raise children and live without anxiety.

However, various social challenges, including rapid progress in aging, Tokyo centralization with the decline of rural areas, frequent major disasters, the risk of a new infection, may be weighing heavily on your efforts to create attractive communities.

- Meanwhile, against a backdrop of the spread of COVID-19, digitalization is rapidly progressing in various situations in civic life and economic activities, which includes the expansion of e-commerce and the spread of remote work.

A new trend in which these new technologies and various data are utilized may bring new rays of hope in solving a range of social challenges that may become even more serious in the future.

- ✓ Improving services to meet individual needs in fields such as health, medical care and tourism
- ✓ Improving the capacity to respond quickly on the basis of real-time data in disaster prevention etc.
- ✓ Streamlining operations / processes / procedures etc. in administrative and other fields
- ✓ Optimizing operations in the fields such as traffic and energy

For example, increasing regional disparities against a background of Tokyo centralization pose a very serious challenge in rural areas.

Meanwhile, the ongoing COVID-19 crisis has significantly changed people's lifestyles and business styles, causing some people to move to rural areas on the precondition that they work online.

Taking this opportunity to pursue 'Smart Local', which is an initiative to revitalize regional cities and communities where residents can enjoy a high quality of life in a rich natural environment while making the most use of data and new technologies, will greatly contribute to solving the social challenge of improving regional disparities.

1-1 Significance of / Need for Smart City Initiatives

- Smart city initiatives, which incorporate these new technologies and data into community development, have already begun and are spreading in and outside Japan.

So far, few cities / regions have 'achieved' their initiatives and few services have directly met the needs of residents, which directly affect residents' lives, and most residents have yet to realize the effects of smart city; however, project examples have steadily been accumulated.

- Regarding the concern that progress in social digitalization may lead to the concentration of personal information and behavior information at certain entities, international discussions as well as activities to gain a common understanding have begun from the perspectives of security, trust and public hygiene. This indicates that an environment in which smart city is socially accepted is gradually being created.
- With the entire social economy irreversibly shifting to digitalization in the future, it is essential to dramatically transform all the urban functions, including traffic, commerce, business, energy and administration, to make them compatible with digitalization (DX: Digital Transformation).
- Under these circumstances, the government is also strongly promoting the digitalization of administration. We propose that we take this opportunity to advance smart city initiatives that promote DX in the entire city / region.
- The government aims to realize Society5.0 in order to achieve SDGs and solve various social challenges. Because smart city should be a showcase of this Society5.0, the government will strongly support the promotion of smart city in cities / regions by combining forces with related ministries and in collaboration with all participants in smart city initiatives.

* In 2020, the government adopted a policy to advance both the effective use of IT for the prevention of the spread of COVID-19, and the reform of social structure / behavioral transformation of the entire society through strengthening of digital infrastructure. It was decided that the Digital Agency, which was to be newly established, would play a central role in the drastic improvement of the central and local governments' digital infrastructure as well as data utilization by public and private sectors.

Reference: Image of smart city

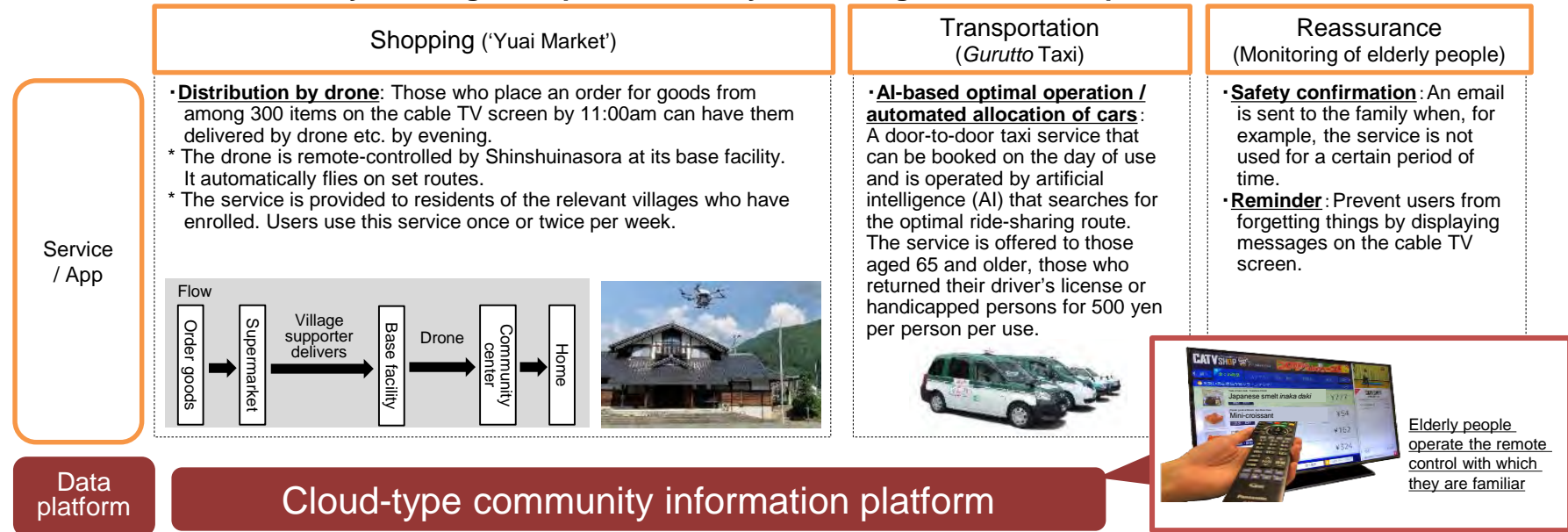
- In order to correct the overconcentration in Tokyo and resolve regional disparities, it is critical to revitalize regional cities and communities as a place for people to live as well as a cradle for innovation, by leveraging digital technologies.
- From this perspective, it is necessary to promote 'Smart Local' initiatives which advance the smartification of life services, including mobility, medical care and welfare, as well as creation of remote work environments, such as 'workation', aligning with the uniqueness / diversity of the region through collaboration between cities.

Services provided through a familiar cable TV remote control (Ina City, Nagano Prefecture)

* Selected as a data utilization-type smart city promotion project by the Ministry of Internal Affairs and Communications in 2019.

Background	<ul style="list-style-type: none">■ A situation in which those living in mountainous areas without a private car, including elderly people, have difficulty in moving around / going shopping■ An approximate 65% of cable TV penetration rate
Summary	<ul style="list-style-type: none">■ Introduction of services that only require the operation of a cable TV remote control with which elderly people are familiar (① shopping, ② transportation, ③ reassurance) -> To maintain communities, state-of-the-art technologies were introduced while involving humans

A community environment was created, in which residents can continue to live in the future, by building a simple versatile system using cable TV as a platform.



1-1. Definition and Effects of Smart City

Definition of Smart City

- Smart city takes various forms depending on the region or the challenge to be solved, but it can be broadly defined as below.
 - ① On the basis of the three basic philosophies and five basic principles mentioned later (Concept)
 - ② By providing services to support each one of residents using new technologies, such as ICT, and various public and private data, and by enhancing management in various fields (e.g. planning, development, management / operation) (Means)
 - ③ Solves challenges faced by cities and regions, and continues to create new value (Action)
 - ④ Being a sustainable city / region where Society 5.0 is realized ahead of the others (State)
- Smart city initiatives are not only for specific cities or regions. It is a policy that can be carried out by all local governments across Japan, with its objectives ranging from the strengthening of international competitiveness for urban areas in large cities, to community development that allows residents to live with rich nature for regions with satoyama / satoumi ('mountain villages' and 'coast villages') that can lead to cyclical symbiotic community in the region (Smart Local).
- Smart city alone will not solve all of the challenges. An ideal image of a city / region can be realized only when it is integrated with policies of various areas, including welfare policy, environmental policy, education policy, industrial promotion policy and urban policy.
- Not only large projects constitute smart city initiatives. Urban and local cities have their respective challenges.
A project that addresses the situation of the region or that meets the needs of the residents can be considered smart city however small it may be.

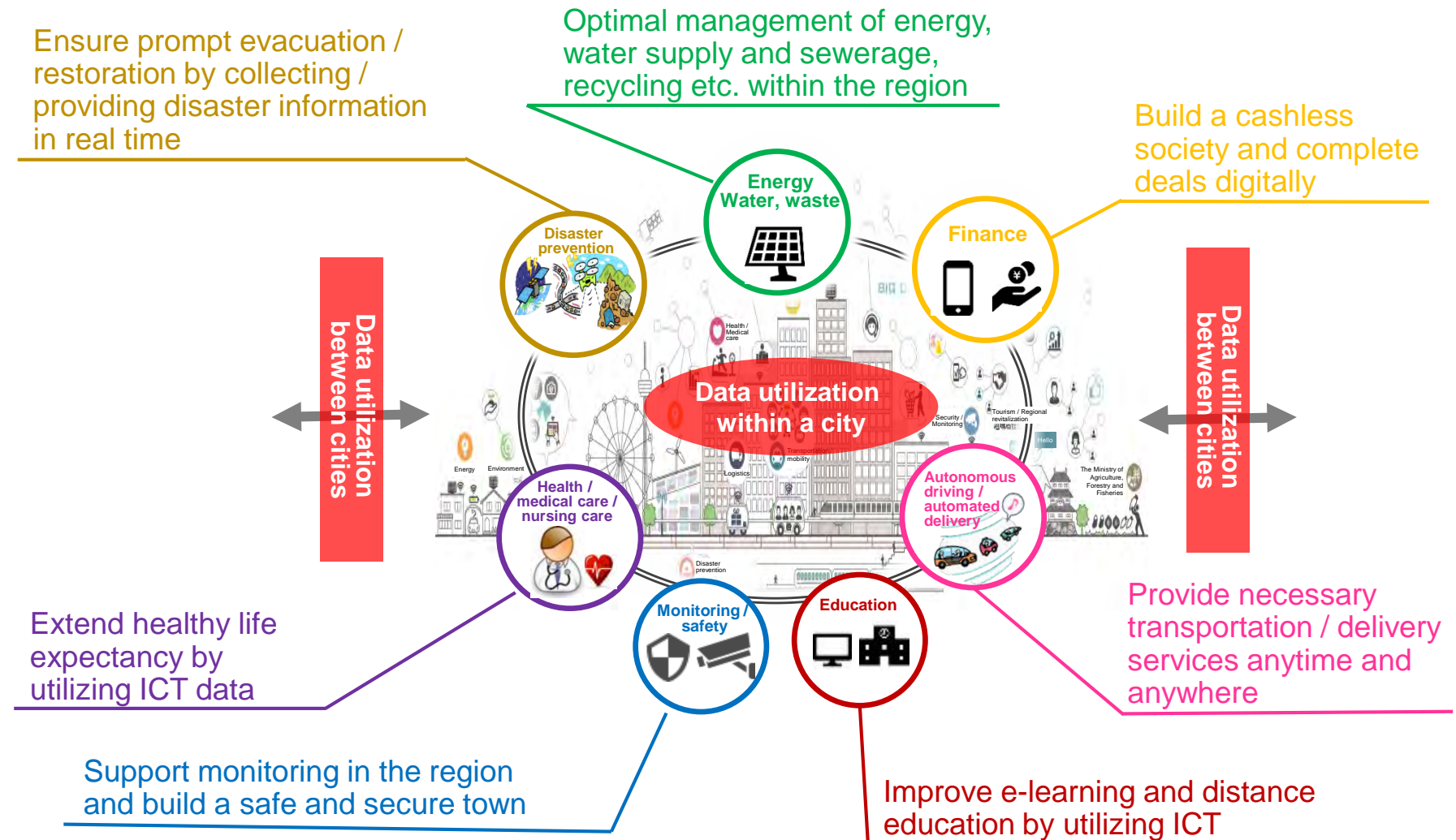
1-1. Definition and Effects of Smart City

Effects of smart city

- The primary goal of smart city is to improve well-being by providing services that support each one of the residents. Its effects range widely, and examples of expected effects are as described below.
 - ① Realization of a safe, high-quality residents' life / urban activity (Society)
 - The effect of realizing social inclusion that enables all the residents to enjoy an equal, convenient and affluent life through the provision of more efficient urban services in all areas, including administrative procedures, purchase, transportation, medical care, health and tourism, as well as the provision of the services that meet individual attributes and preferences
 - The effect of providing a safe and secure life by taking data-based prompt measures in emergencies, such as during a disaster or the spread of infectious disease, or by offering a new remote / real space for living / working in new normal life
 - ② Realization of sustainable and creative city management / city economy (Economy)
 - The effect of producing an environment in which a variety of services for residents and companies are created one after another using various data and new technologies, revitalizing the regional economy
 - The effect of moving a regional economy through the consumption and purchase of services by residents and visitors who come and go in a safe, convenient and comfortable town, as well as creating diverse innovations through interactions
 - The effect of increasing the efficiency of systems at companies and governments, improving productivity
 - ③ Realization of environmentally friendly cities / regions (Environment)
 - The effect of optimizing the use of energy / resources in line with the actual travel of people and goods in all situations, such as business operations, daily lives and travel behaviors, realizing a decarbonized society
- These days, the realization of SDGs 'No one will be left behind' is becoming a major social theme. Smart city is expected not only to have the effects mentioned above but also to play a role as a major policy tool in realizing SDGs.

1-1. What Will Smart City Improve?

- It is expected to improve comprehensive services by collecting / utilizing various data across a diverse range of sectors. (Described below are examples)
- In addition, it is expected to solve challenges with new frameworks through the involvement of academy, industry and government as well as residents from many cities / many fields.



1-2 Principles and Basic Philosophies of Smart City Initiatives

1-2 Basic Concept of smart city Initiatives

Three Basic Philosophies

➤ **Being resident-(user-)centric**

- It is important to understand that the main aim of smart city is to 'improve well-being' and take a demand side-driven approach, in which residents, i.e. primary users, take initiatives, instead of a supply side-driven one, in which governments and private companies take initiatives.

➤ **Being vision- / challenge-focused**

- In order for smart city to take root in cities / regions as sustainable initiatives, it is necessary to aim to provide services that meet the real needs of each city / region.
- From this perspective, it is essential to address smart city on the basis of the idea that 'utilize new technologies to solve challenges and realize visions' for cities and regions.

➤ **Attaching importance to collaboration among sectors / cities**

- Although smart city initiatives are beginning across Japan, most are still in the verification stage within individual cities / regions, and few have reached a continuous operation or implementation stage; this may be contributing to insufficient public awareness of smart city.
- It is expected that utilizing data from various fields in a cross-sectoral way will address compound challenges and achieve the total optimization of a city / region.
- From the viewpoints of addressing cross-regional challenges, eliminating regional disparities, reducing the cost of introduction etc. collaboration among multiple local governments is important.

1-2 Basic Concept of smart city Initiatives

Five Basic Principles

➤ **Ensuring fairness and inclusiveness**

- Aim to realize a smart city that allows all the residents to equally enjoy services regardless their level of digital literacy or other attributes, and allows organizations, including all companies, research institutions like universities and civic groups to participate.

➤ **Privacy protection**

- Utilize personal data, including private information, from the standpoint of providing high-quality services tailored to the needs of individual residents and users.
- In doing that, ensure the protection of residents' privacy by taking steps necessary to gain the full understanding and trust of the residents, including complying with laws on the protection of private information and collecting / providing private information by obtaining consent from relevant individuals and in accordance with transparent rules and procedures.

➤ **Ensuring interoperability, openness and transparency**

- Make data platform interoperable with other regions and other systems for the nationwide efficient promotion of smart city.
- Build an open data distribution environment in which everyone can, at their discretion, provide data, and search for and obtain necessary data. Create transparent operation and decision-making processes.

➤ **Ensuring security and resiliency**

- From the viewpoints of privacy protection, ensuring safety of services provided, system continuity in emergencies, including during a disaster etc., ensure proper security and resiliency for systems including data platform.

➤ **Ensuring operational and financial sustainability**

- As a precondition to realize a smart city that supports civic life and various city activities, ensure operational and financial sustainability. This is realized by a core organization, such as a local government, which serves as the control tower, and the driving entity consisting mainly of public, private and academic entities, which appropriately collaborate, play their respective roles functionally and flexibly and bear the cost of system maintenance and service provision to provide stable and independent financial resources.

1-2 Basic Concept of smart city Initiatives



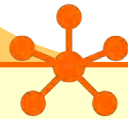
Being resident-(user-)centric

To 'improve well-being,' take the standpoint of residents and respect their independent activities



Being vision- / challenge-focused

Attach importance to 'solving challenges and realizing visions', not only thinking that use of 'new technology' is essential



Three Basic Philosophies

Attaching importance to collaboration among sectors / cities

Attach importance to cross-sectoral data linkage and cross-regional collaboration to address compound or cross-regional challenges.



Ensuring fairness and inclusiveness

Build a smart city that allows all the residents to equally enjoy services and all the entities to participate in



Privacy protection

Ensure the protection of residents' privacy in utilizing their personal data



Ensuring operational and financial sustainability

Ensure operational and financial sustainability to realize a sustainable smart city that takes root in the community



Ensuring security and resiliency

Ensure security and resiliency to protect privacy and prepare for emergencies including disasters



Ensuring interoperability, openness and transparency

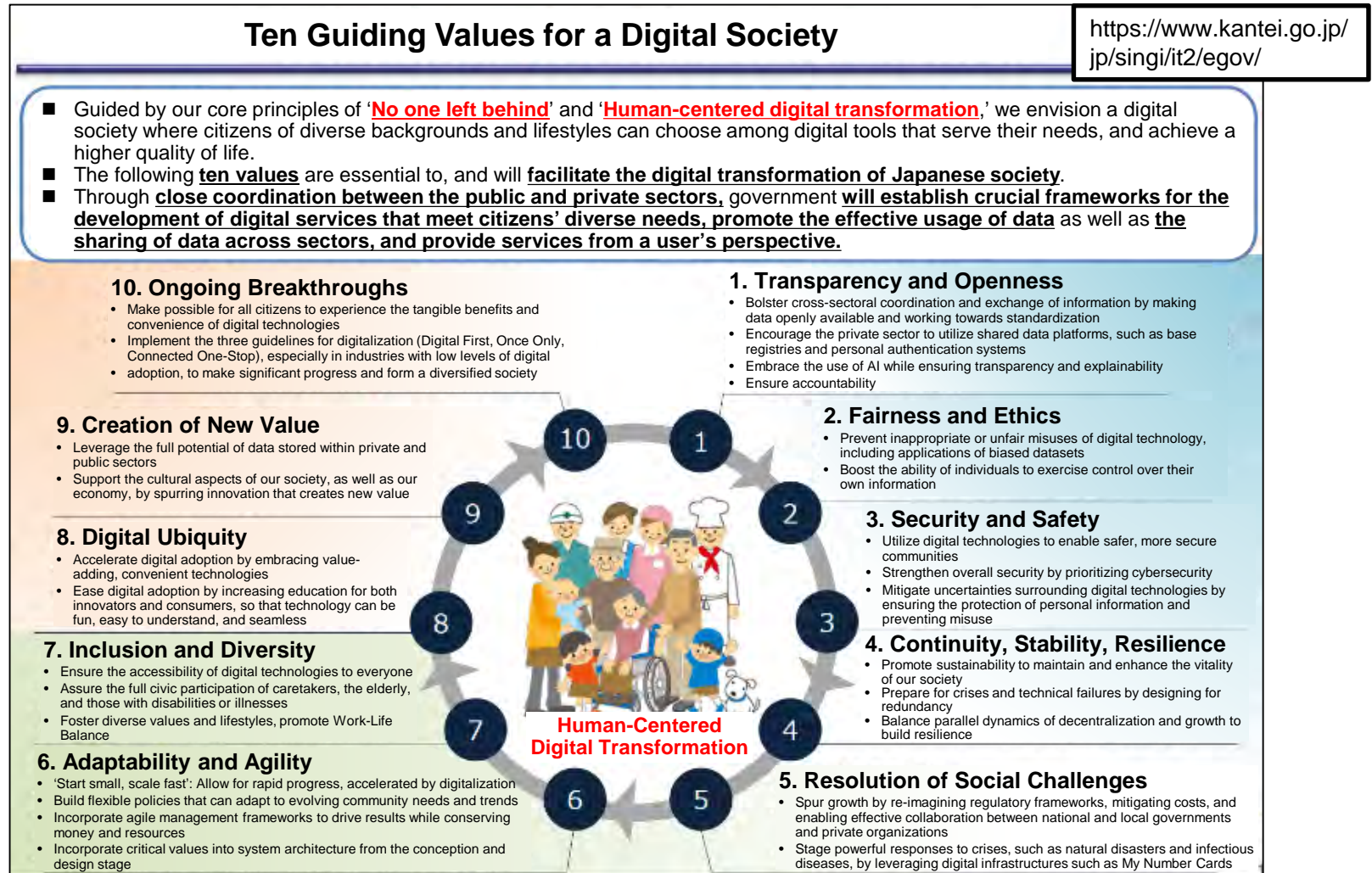
Ensure the interoperability of data platform, an open data distribution environment, transparency of the decision-making process etc.

Five Basic Principles

Reference: 'Basic Principles for the Formation of a Digital Society'

The government conference 'Digital Transformation Promotion Bills Working Group' formulated basic principles to realize a digital society where residents can choose services that meet their own needs and achieve a various forms of happiness by pursuing the principles of 'No one left behind' and 'Human-centered digital transformation.'

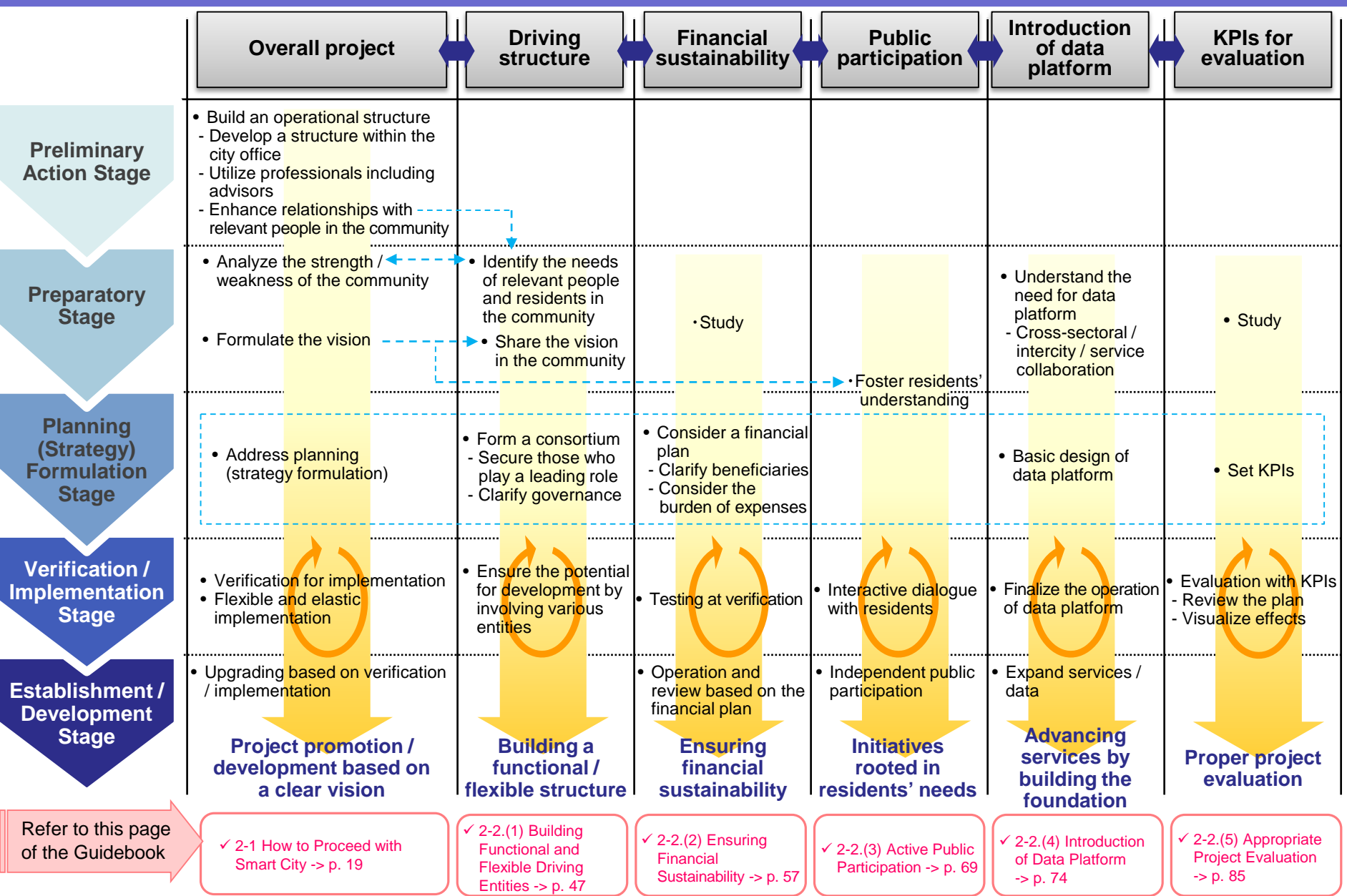
-> Smart city also follows these basic principles, from which important items are excerpted.



Chapter 2

Toward the Realization of Smart City

Toward the Realization of Smart City: Overall Picture



* This overall picture was created by sorting out and averaging collected examples, and how to proceed with an initiative varies depending on the actual situation of the community.

2-1 How to Proceed with Smart City

2-1 Types of Smart Cities

○ Smart city can take a variety of forms depending of factors, such as the target area, objective, contents of the project, entities that play a central role and size of the city. This Guidebook covers the two types below, which are considered to be typical. * The two types below were summarized as average images on the basis of collected examples, and the actual situation varies from community to community.

	Government-initiated type	Area management type
Target area	○ An area with the scale of a city or urban area	○ Target specific district scale areas
Objective / description	○ Initiatives that increase the efficiency of administration systems or provide various administrative services mostly to improve well-being of residents	○ Initiatives that provide services aimed at supporting the lives of community residents and the business operations of companies based in the district mostly to enhance the value of the district
Driving entity	○ Consortium led by local government etc.	○ Consortium led by community development organization and a local government etc.
Major role of local government	○ Supervise / lead the formation of a consortium, establishment of rules and planning (strategy) formulation as well as facilitate progress ○ Provide various administrative services etc.	○ Take the initiative in forming a consortium and planning (strategy) formulation in collaboration with a community development organization ○ Clarify the status of the district in administration plans and policies, and support the activities of community development organization
Major entities involved	<div>Service</div> <div>Local government / Corporation operating Smart City*1 / Private sector</div> <div>○ Examples of services provided: administrative procedures, disaster prevention, crime prevention, medical care / welfare, health, mobility, education, industry, infrastructure management</div> <div>○ Service users : residents of / visitors to the entire city area</div> <div>Data platform</div> <div>Local government / Corporation operating smart city</div> <div>Data</div> <div>Local government / Corporation operating smart city / Private sector</div>	<div>Service</div> <div>Community development organization*2 / Local government / Private sector</div> <div>○ Examples of services provided: dissemination of town information, town block management (i.e. infrastructure management, cleaning, security, logistics, energy)</div> <div>○ Service users : residents and companies of / visitors to a specific district</div> <div>Data platform</div> <div>Local government (Community development organization)</div> <div>Data</div> <div>Community development organization / Local government / Private sector</div>

*1. Corporation operating smart city: A corporation (e.g. joint stock company, corporate juridical person) that is specifically set up under the driving entities to operate smart city

*2. Community development organization: An organization consisting of relevant people in a specific district, including an area management corporation and a Town Management Organization (TMO), and engaging in activities to revitalize, and improve the quality of, the district.

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2-1 How to Proceed with Smart City

Described below are the chronological explanations of matters to do and points to note toward the realization of smart city.

- Because this Guidebook is primarily intended for local governments, explanations are focused on the government-initiated type, in which a local government plays a greater role.

Preliminary Action Stage

Stage during which smart city is initiated and started

- Clarify an awareness of issues / a sense of purpose
- Strengthen the structure of a local government etc.

Preparatory Stage

Stage during which the policy of an initiative is decided and shared with residents and the organization is built

- Build a core structure that leads the project
- Share the core structure and vision with residents

Planning (Strategy) Formulation Stage

Stage during which concrete initiatives are made and strong driving structure is built

- Form a project driving entity (consortium)
- Consider / draw up a concrete plan for realizing the project

Verification / Implementation Stage

Stage during which the social acceptability of services is verified and implemented in society step by step

Establishment / Development Stage

Stage during which implemented services are properly monitored, improved and smart city is established in the community

2-1 How to Proceed with Smart City: Example (Utsunomiya City)

■ Process at Utsunomiya City

- Utsunomiya City promotes smart city as a means to realize a network-type compact city.
- With a focus on LRT, the city is implementing the initiative in the areas of mobility (e.g. AI-based operations), hospitality (e.g. biometric authentication) and energy (e.g. a regional power producer and supplier)

Preliminary Action Stage

Clarify
a sense of
purpose

- A joint research with Waseda University in the field of transportation / energy led to a smart city initiative that combines the field with services of other departments (mobility, tourism), then a common sense of purpose was clarified.
- **A common sense of the sophistication / acceleration of a network-type compact city with ICT** was developed.

Preparatory Stage

Set up
a council

Develop
a vision

Strengthen
the city
structure

- A council was set up by eight organizations consisting mainly of companies participating in the research with the city and Waseda University. A structure was built in which university professors **serve as advisers** on the contents of the initiative and the operation of the council.
- Council members considered the vision. It was developed in line with the city's administrative plans.
- **A project team was launched** in the city office (cross-sectoral collaboration was established)

Planning (Strategy) Formulation Stage

Strengthen
the council
structure

Planning

Strengthen
the city
structure

- Toward the full-scale implementation of the initiative, **applications for additional council members were invited from the public, and 16 organizations with motivation for independent verification were selected.** Area-specific working groups were set up for project promotion.
- **A smart city action plan was developed.**
- **A department dedicated for the promotion of smart city (Smart City Promotion Office) was set up** in the city office.

Verification / Implementation Stage

Verification
test
Business model

- Business models studied in the action plan were **materialized through verification.**

Share
information
with residents

- In conducting verification tests, information was shared / opinions were exchanged with organizations including a community association and a shopping district association.

Data
platform

- The introduction of data platform was considered to explore the possibility of linking data between activities of different areas.

Establishment / Development Stage

* To be implemented step by step from 2021

(1) Preliminary Action Stage ① - Government-initiated type

■ Develop a driving structure within the city office by involving all the relevant departments with support from professionals, such as advisers / architects, and make preparations for serious consideration by building up the momentum through dialogues with relevant people in the community, including the municipal assembly, local business leaders and regional residents' groups.

➤ **Build an operational structure involving all sections**

- Utilize professionals such as advisers and architects
 - It is important to utilize professionals with expertise who support a local government by, for example, providing various information, coordinating with private companies and providing advice on services introduced.
 - From this viewpoint, it is necessary as a first step to invite specialists in areas, such as digitalization, industrial promotion, community development and private information, as advisers or specialist staff in the city office.
 - * The areas and number of specialists are not fixed; they should flexibly be considered according to the necessity at each stage.

• Develop a structure within the city office

- It is also necessary to develop a functional and flexible structure within the city office by, for example, setting up as an organization directly supervised by the head of a cross-sectional project team, which consists of departments, such as information / planning, industrial promotion and policy implementation (e.g. welfare, community development, environment).

- ✓ In order to focus the attention of local government staff and relevant people in the community on smart city promotion, it may be effective for the head of a local government to express the intention by, for example, declaring the promotion of smart city.
- ✓ Developing an organizational structure is only a first step. The important point is to steadily continue to improve the organizational structure until it works while strengthening it and creating mechanisms.

• Enhance staff members' knowledge

- Another important point is to enhance staff members' knowledge step by step by constantly holding training courses and hiring IT personnel so that a certain level of knowledge about smart city can be gained at all the relevant departments.

➤ **Have dialogues with community stakeholders, including the municipal assembly, local business leaders, regional residents' groups and local universities, and build up the momentum**

- It is also important to build up the momentum for a united effort in the community with support from advisers by, for example, holding study meetings with relevant people in the community and providing courses for them.

- ✓ Having wide-ranging project areas and relevant people, smart city initiatives tend to lose focus. Therefore, it is effective to share the original intent of an initiative among local government staff as well as with relevant people in the community.

(1) Preliminary Action Stage ② - Government-initiated type

Points to note

- ① Build a close collaboration between advisers etc. and a local government (Do not leave the entirety of the operations to advisers)
 - Some local governments leave all the operations, from clarifying challenges to determining contents, to advisers etc.
 - Reflecting, as a local government familiar with the community, on what priority policies have been adopted and why as well as what strengths / weakness the community has, sharing these matters with advisers etc. and closely collaborating with them will lead to the most effective use of the capabilities of advisers etc.
 - In view of this, it is also effective to clarify the roles and authority of advisers etc. in a document.
- ② Build a structure involving all sections (Eliminate the harmful effects of sectionalism)
 - Some smart city initiatives are fragmentary because only responsible departments, such as information and planning departments, work hard without full cooperation from departments that implement policies.
 - It is true that departments that implement policies do not have sufficient knowledge / experience in the digital area and that digitalization will change the mechanisms and operations of administration themselves, but the steps below will help you gain their understanding and cooperation step by step.
 - ① Set up a flexible and practical organization in the city office, which may take a form of the project team directly supervised by the head of a local government, instead of a routine meeting like a liaison conference within the city office, and in doing this, incorporate departments that implement priority policies in the team.
 - ② With support from advisers, hold discussions on how the individual policies and operations of departments that implement policies can be improved through the utilization of digital technologies and data, accumulate small successful experiences and gain their understanding gradually.
 - ③ Raise the level of understanding by taking measures, including enhancing the training of staff at departments that implement policies and by assigning staff knowledgeable about data analysis.
 - Note that the responsible department without sufficient authority cannot facilitate the initiative. It may be worth considering clarifying in advance the roles and authority of the responsible department as well as the expected roles of departments that implement policies.

(1) Examples of Initiatives at Preliminary Action Stage

OBuild an operational structure involving all sections

-- Develop a structure within the city office, enhance staff members' knowledge

Establishment of a department that promotes ICT (Sapporo City)

- **The department responsible for ICT strategy promotion was newly established** in the community development policy bureau.
- **Sapporo City ICT Utilization Strategy was formulated as an initiative for a cross-sectoral approach**, which includes the utilization of data from public and private sectors.
- * The city announced that starting from FY2021, 'Digital promotion bureau head' would be established and the department responsible for ICT strategy promotion be transferred to the smart city promotion department.



Source: Sapporo City website:
<https://www.city.sapporo.jp/kikaku/ictplan/>

Improvement of staff members' IT skills, collaboration with a university in the community (Aizuwakamatsu City)

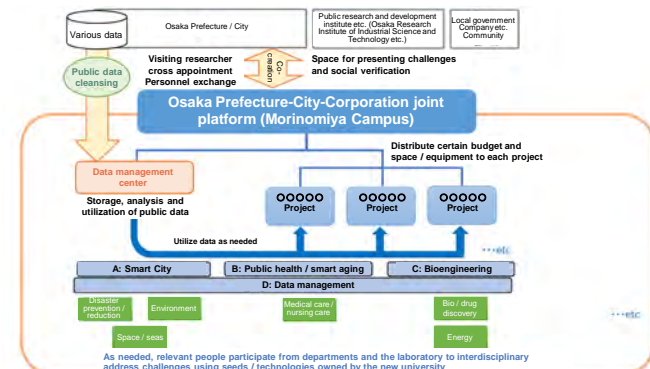
- **As cross-sectoral organizations in the city office, the informatization management and promotion committee (the deputy mayor serves as CIO)** and its subordinate, the informatization policy study team (consisting of four teams [three at the time of establishment], including the digital government promotion study team), were established.
- To enhance staff members' ICT skills, those who had worked at the information policy department were assigned to relevant departments, and **a informatization personnel registration system (passing the examination of data-processing technician is required for the registration) was created.**
- Moreover, **in collaboration with the University of Aizu, which specializes in ICT**, local analytics personnel are developed, and graduates of the University are continued to be employed as staff.



Source: <http://www.lictia.jp/>

Joint platform with a public university (Osaka Prefecture / City)

- Osaka Prefecture / City will open the Osaka Metropolitan University (tentative name) by merging Osaka Prefecture University with Osaka City University in 2022.
- The new university will **establish a joint platform with the government, and contribute to solving challenges faced by cities in Osaka by leveraging the public university's advantages**, such as public data analysis and the industry-academia-government network.



(Source) Osaka Prefectural Government Basic concept of the new university (July 2020)
http://www.pref.osaka.lg.jp/fukatsu/koritsudai_osaka/shindaigaku_kihon.html

(1) Examples of Initiatives at Preliminary Action Stage

OBUILD an operational structure involving all sections -- Utilize professionals such as advisers and architects

Invitation of external specialists (Kaga City)

- Kaga City of Ishikawa Prefecture and the Japan Research Institute, Limited, concluded a 'Partnership agreement on Smarty City promotion in Kaga City.'
- Under the public-private-partnership, regional challenges were identified, a policy system was clarified and support was provided for policy making with specialists to realize a comprehensive smart city. .

Source: <https://www.jri.co.jp/page.jsp?id=34963>

Conclusion of a comprehensive partnership agreement (Kobe City)

- Kobe City of Hyogo Prefecture and Microsoft Japan Co., Ltd. signed on 4 June, 2020 a comprehensive partnership agreement on four subjects, including 'Working style reforms' and 'Promotion of data linkage infrastructure toward the realization of smart city', triggered by COVID-19 countermeasures.
- Microsoft provided advice on smart city and conducted a research on data linkage infrastructure and a trial project of smart city services.



Source: <https://www.city.kobe.lg.jp/a05822/292356629182.html>

System to support the dispatch of specialists

- The Ministry of Internal Affairs and Communications commissions specialists in ICT and data utilization to serve as 'regional informatization advisers' and dispatch them at the request of local governments and other organizations.
- A specialist can be dispatched for up to three days per application with the applicant bearing no cost of the specialist's travel expenses and honorarium.



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Representative member, Geore public Japan limited liability company



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Chief of the application usage scene working group, The Fifth
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Akiko Takahashi
Coordinator, empublic Ltd.
Part-time lecturer, Faculty of Urban Innovation, Asia University

- Provide support in 26 areas, including open data, network infrastructure and human resource development
- In FY2020, a total of 207 specialists were commissioned

Source: Website of the Association for Promotion of Public Local Information and Communication
(<https://www.applc.or.jp/page-1862/>)

Involvement of an architect in Super City initiatives

- In inviting applications from the public for districts designated as 'Super City', which started in December 2020, the involvement of an 'architect' who plans the overall Super City initiative, including the setting of regional challenges, development of project plans and utilization of advanced technologies, was required.

(1) Examples of Initiatives at Preliminary Action Stage

○ Strengthen a local government's operational structure and build an driving structure involving all sections -- Initiative for Digital Transformation at Bandai Town, Fukushima Prefecture

Creation of CDO

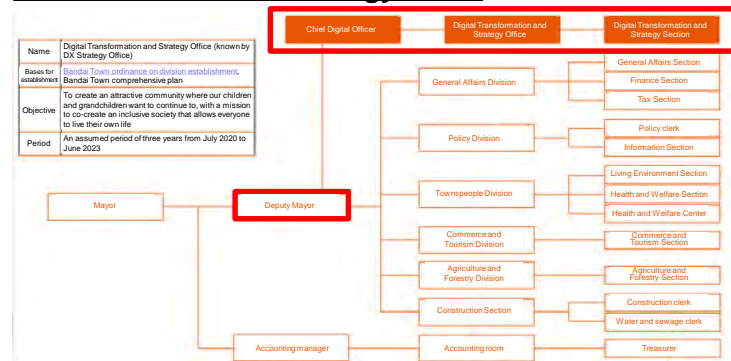
- Bandai Town of Fukushima Prefecture established in November 2019 the post of 'CDO (Chief Digital Officer)' for the first time as a local government in order to promote town administration, improve operational processes at the town office and formulate data-based policies by utilizing digital technologies.



Establishment of the 'Digital Transformation and Strategy Office'

- To promote DX, the 'Digital Transformation and Strategy Office' was established as a cross-sectoral organization directly supervised by the deputy mayor on the basis of the Bandai Town comprehensive plan and the Bandai Town ordinance on division establishment.
- A temporary organization established for an assumed period of three years.

○ Organizational positions of CDO and the Digital Transformation and Strategy Office



Guideline for the creation of Bandai Town Chief Digital Officer (enforced on 1 June, 2020)

* Excerpt

(Establishment)

Article 1. The Mayor shall establish the post of the Bandai Town Chief Digital Officer (hereinafter referred to as 'CDO') who heads up the digitalization of administration, and assign a person who have professional knowledge, skills or experience to the post, in order to contribute to improving resident welfare by utilizing digital technologies.

(Duties)

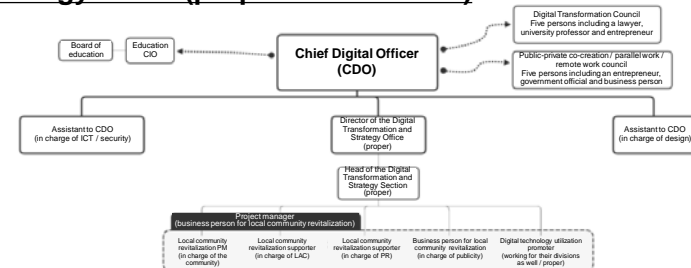
Article 2. The CDO shall perform the duties listed below at the Mayor's request.

- (1) Matters concerning the digitalization of administration.
- (2) Matters concerning policies and planning of informatization measures.
- (3) Other matters specified by the Mayor.

(Appointment)

Article 3. CDO shall be appointed by the Mayor from among those who have professional knowledge, skills or experience.

○ Organizational structure of the Digital Transformation and Strategy Office (proposal for FY2021)



Source: Website of Bandai Town (<https://www.town.bandai.fukushima.jp/site/dx/>)

(2) Preparatory Stage ① -- Government-initiated type

- Share in the community the vision for an ideal smart city by clarifying the community's goals to be achieved, challenges and advantageous natural environment / culture / industry, while understanding the needs of relevant people and residents in the community.
- In addition, share the benefits of introducing a data platform among relevant people.

➤ **Clarify the challenges, resources and strong / weak points of the community**

- It is helpful to review the present situation and challenges of the community before beginning to consider details, by, for example, clarifying goals to be achieved, challenges, important policies, and community's local resources and advantageous natural environment / culture / industry, on the basis of the local government comprehensive plan etc.

➤ **Identify the needs of relevant people in the community and residents**

- It is important to identify the needs, or what the community wants through smart city by continuing to have dialogues with relevant people in the community and trying to carefully understand residents' needs.

➤ **Understand the need for data platform**

- The solution using a silo-type (see p. 33) ICT (information and communications technology) system, which is built for each theme of various community challenges, has achieved many successful results. However, since individual silo-type systems are independent and not linked to each other, a significant number of databases and apps have been buried. This issue has become increasingly evident.
- To avoid making the same mistake, it is an effective option to build a data platform as a common system foundation.
- Although building a data platform alone will not realize smart city or solve challenges, an data platform is needed in the groundwork ('Make haste slowly'), and its benefits should be shared among relevant people.

(2) Preparatory Stage ① -- Government-initiated type

➤ Share the vision in the community

- In constructing the framework of a smart city project, it is crucial to discuss, on the basis of the aforementioned clarification and understanding, what should be aimed at, which policy areas should be strengthened and which advantages should be enhanced through the utilization of smart technologies and various data, among the structure in the city office, specialists including advisers, relevant people in the community (e.g. business community, universities), experts from various fields and private companies that can become key partners, and to form a common understanding of goals to be achieved (vision).
- The contents of the discussions can be compiled as a vision, and if the timing coincides with the revision of a comprehensive plan etc., can be clearly stated in the comprehensive plan while having in-depth discussions on the combinations of policies / measures utilizing smart technologies and other policies / measures.
 - ✓ It is another effective approach to gradually gain the community's understanding and momentum through practical activities that strengthen the current priority measures of the comprehensive plan etc. one by one by utilizing smart technologies and various data before trying to consider and share a vision.
- In this stage that is aimed at discussing goals to be achieved, it is effective to make efforts to share them with relevant people and residents in the community as broadly as possible, including the process of discussions.

Points to note

- ① Awareness of the importance of Preliminary Action / Preparatory stages (Avoid formulating a rough-and-ready, superficial vision plan)
 - Rushing to a smart city, some local governments make a smart city plan by leaving almost all operations to consultants etc. without sufficient development of personnel in the city office or dialogues within the community.
 - A smart city can be realized only when the government, business community and residents each understand and efficiently use smart technologies; it is essential to build a strong foundation without turning Preliminary Action / Preparatory stages into a mere formality.

(2) Preparatory Stage ② -- Government-initiated type

Points to note

② Participation by diverse entities in consideration (from supplier-centered to resident-centered)

- In some cases, only the relevant people on 'the supplier side', mostly consisting of the government, private IT / communications companies and specialists from the digital field, are involved in discussions to formulate a vision etc.
- Since smart city is originally aimed at evolving residents' lives and various city activities to make them more comfortable, affluent and safer, involving specialists and relevant people from a variety of fields and levels is effective in this stage, in which the future direction is discussed.

For example, health / medical care / welfare, universal design, biodiversity, environment, diversity, ethics, law and sociology.

- It is also an effective process to spur open discussions by residents as much as possible, by, for example, collaborating with residents' groups engaging in Living Lab and community activities, or soliciting a wide range of proposals from residents using an interactive tool.
- In addition, it may be helpful to build relationships with not only the local business community but also private companies that will support a future ecosystem, through collaboration with startups operating in the community.

③ Unit of data platform construction

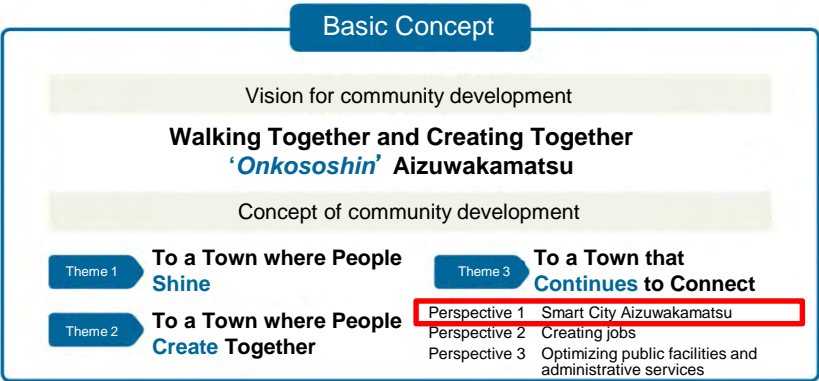
- Presently, a data platform is often constructed by each individual municipality, but independently building a data platform appears to be burdensome for a single municipality.
- Shared use by multiple municipalities centered around an ordinance-designated city / core city, as well as a move by a prefecture to take the lead in constructing data platform for shared use by its municipalities have begun to emerge. These measures may be considered effective.

(2) Examples of Initiatives at Preparatory Stage

○ Formulation of a vision and sharing in the community

Inclusion in a comprehensive plan through town meetings with residents (Aizuwakamatsu City)

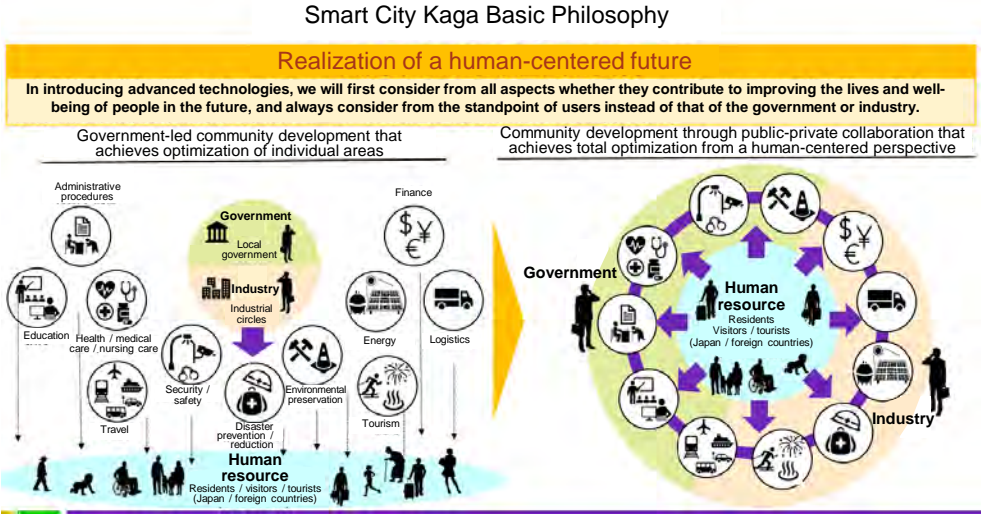
- In its highest-level plan 'Aizuwakamatsu City Seventh Comprehensive Plan' (planning period: FY2017 to FY2026), the city positioned 'Smart City Aizuwakamatsu' as one of the major perspectives to promote the creation of a sustainable, resilient and strong community in which residents can live a secure and comfortable life, in one of the three concepts of the plan, 'To a Town that Continues to Connect'.
- In preparing the Comprehensive Plan, the city conducted a questionnaire survey of residents and held town meetings to share the policies of the city with residents, and reflected the opinions of residents in the Plan.



<https://www.city.aizuwakamatsu.fukushima.jp/docs/2016110400058/>

'Kaga City Smart City Declaration' (Kaga City)

- The city announced on 30 March, 2020 the basic concept of 'Realization of a human-centered future society' and the operation principle, 'Kaga City Smart City Declaration'.
- At the same time, the city developed 'Smart City Kaga Initiative' and 'Kaga City Public and Private Sector Data Utilization Promotion Plan' that specify steps to realization and basic policies of various data utilization.

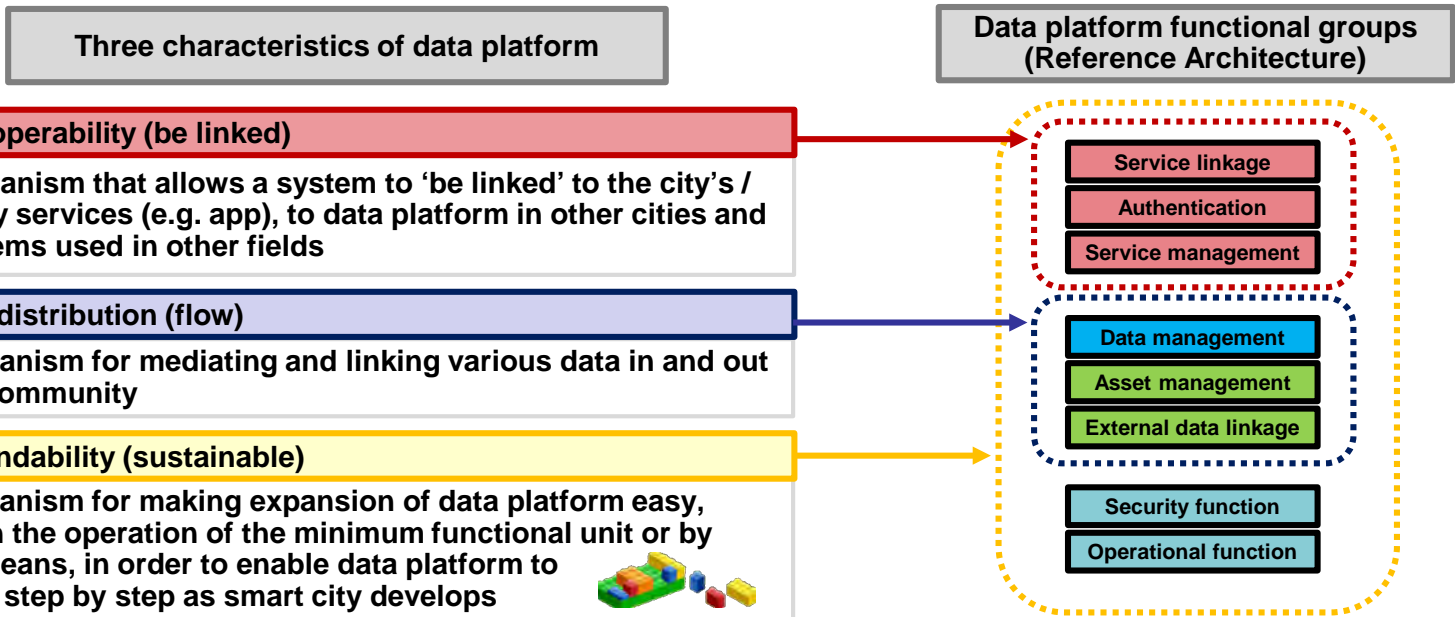


https://www.city.kaga.ishikawa.jp/shisei_gikai/smartcity/5252.html

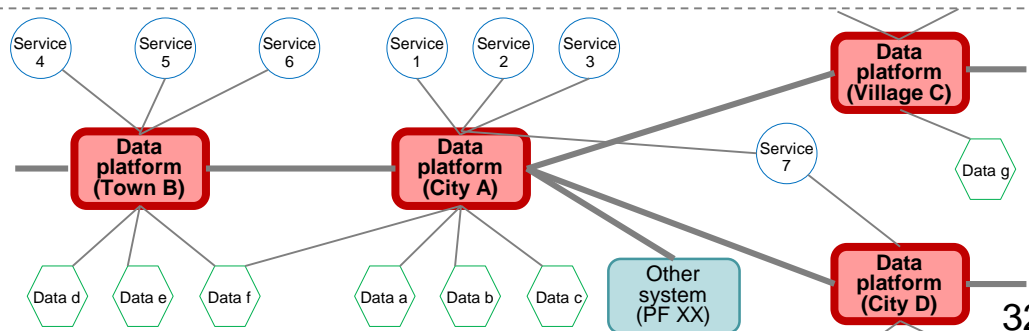
(2) Preparatory Stage---Need for data platform

○ What is data platform?

- Data platform: A general term for IT systems that facilitate the introduction of various services to be realized through smart city, by integrating functions that communities intending to realize smart city commonly use to realize smart city.
- **The functionality requirements, stated in the ‘Smart City Reference Architecture’, can broadly be divided into the three characters: ① interoperability (be linked), ② data distribution (flow) and ③ expandability (sustainable).**



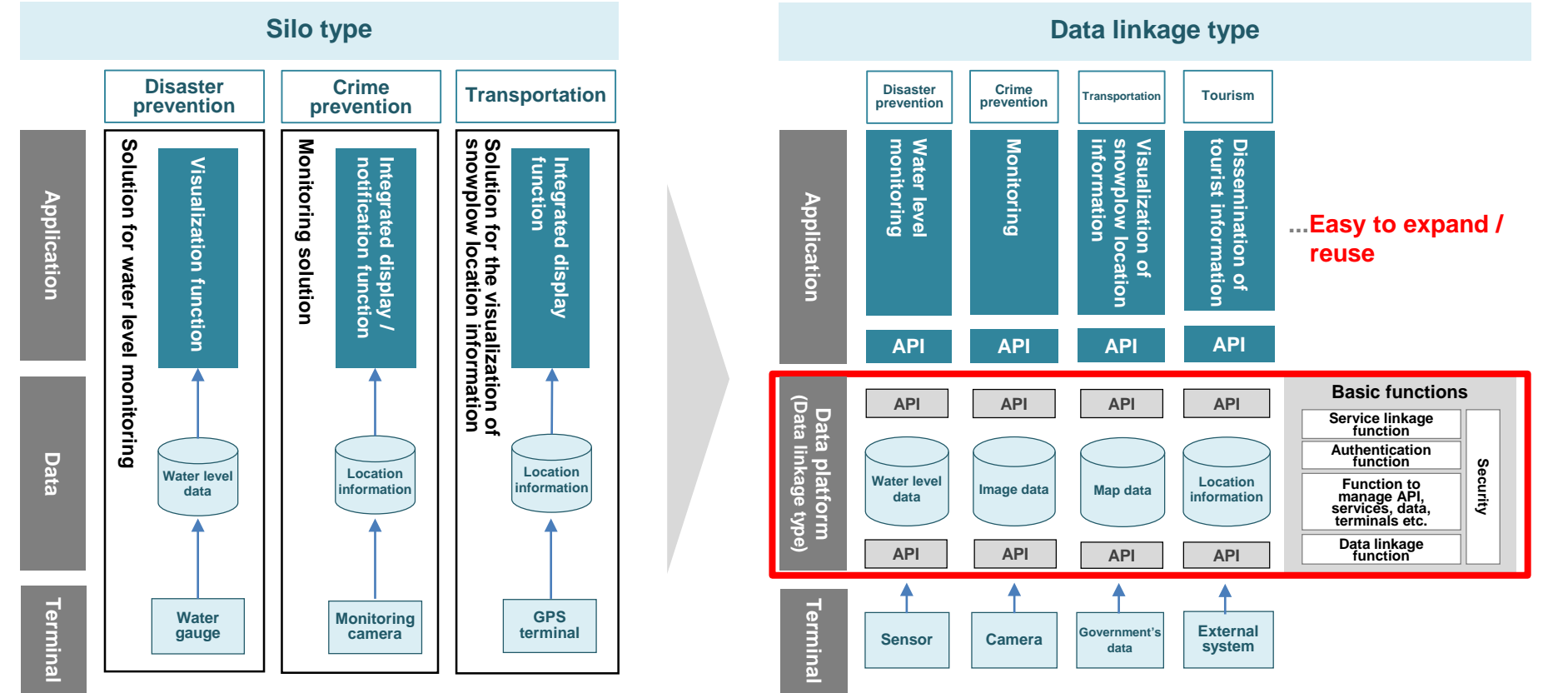
- Origin / image of data platform**
- Originating from the fact that the birth of OS enabled computers of different types to use the same software, a data linkage platform etc. is figuratively called '**City OS**' in Japan.
 - However, unlike computers, cities themselves function without (City) OS, and therefore, it is more accurate to consider it '**the node of a network that links data and services of different cities**'.



(2) Preparatory Stage---Need for data platform

○ Need for data platform (data linkage platform etc.) ①: Breaking away from silo-type systems

- Silo (bulk storage) type: If Smart City Initiatives are individually implemented without constructing a data linkage platform, **each solution will vertically stands in parallel with each other like silos, preventing the linkage / distribution of data and services**. In addition, they entail **high development cost because** constructed systems and services **cannot be reused**.
- Data linkage type: The construction of the data linkage platform of data platform will enable data sent from terminals, such as a sensor, to be efficiently collected / managed and linked with each other between cities / sectors.



(2) Preparatory Stage---Need for data platform

○ Need for data platform (data linkage platform etc.) ② Linkage between cities / sectors / services

- There are **different applications in different cities**
- Constructed systems and services cannot be reused, **keeping each city's development cost at high levels**

- **Only one-to-one linkages are possible between data and services**, preventing the maximization of data value
- Analysis technology with AI etc. cannot be used to the full

- **Services are not integrated / linked between sectors even within the same city, making it difficult to improve the convenience of residents** (e.g. each app / service requires login)

Construction of data platform

Linkage between cities

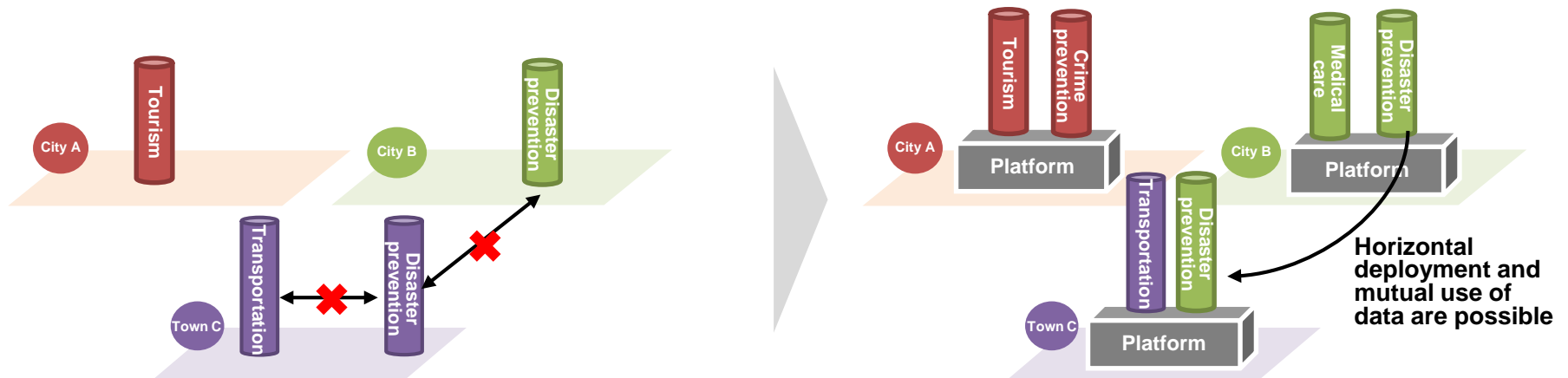
- ❑ Even if one's city of residence and city of employment are different, **wide-area services can be provided**
 - > Allows wide-area alert at the time of disaster
 - > Expands the market size
- ❑ Horizontal deployment will enable new systems to **be developed faster and at lower cost**

Linkage between sectors

- ❑ Utilizing data across sectors and organizations will become possible, **leading to the provision of advanced services**
 - > Disaster prevention measures can be advanced using a combination of hazard maps, road traffic records, satellite images, meteorological data etc.

Service linkage

- ❑ Linking individual services for residents with data **will achieve one-stop services**
- ❑ It will become possible for anyone to develop services at low cost (the democratization of innovation)



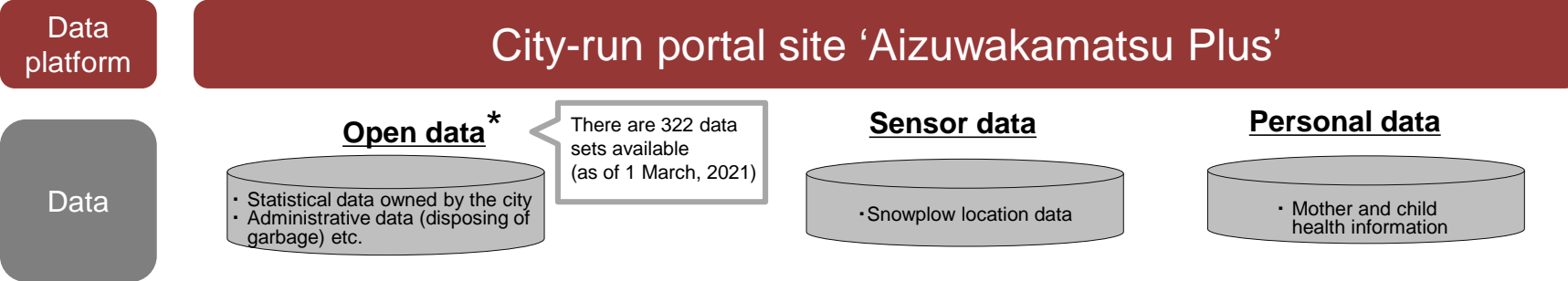
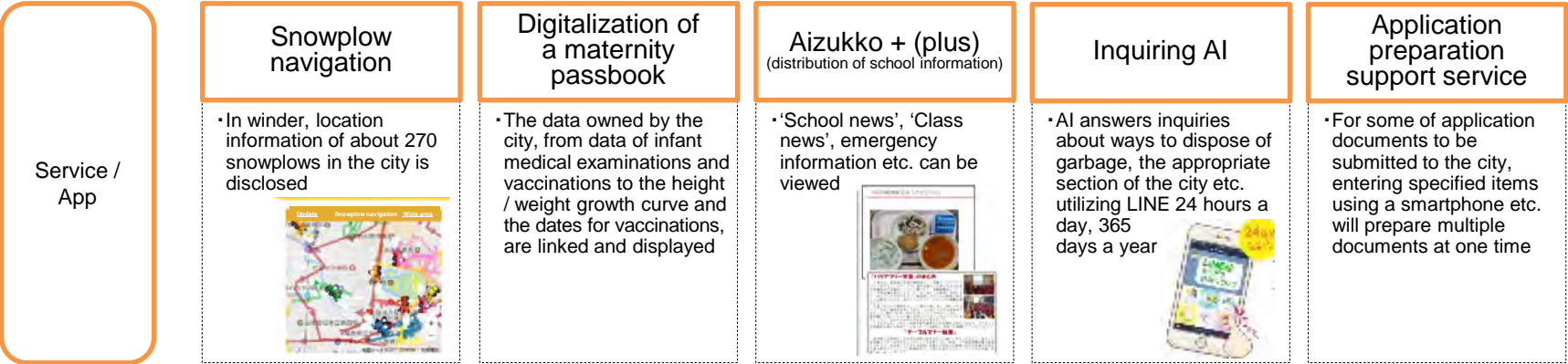
Reference: Introduction example of data platform

■ Providing services utilizing data platform (Aizuwakamatsu City, Fukushima Prefecture)

* Selected as a data utilization-type smart city promotion project by the Ministry of Internal Affairs and Communications in 2017.

- In December 2015, the city-run portal site / data platform 'Aizuwakamatsu Plus' started its operation
- Largely, five services are linked to data platform 'Aizuwakamatsu Plus' -> Verification is ongoing in other fields including payment
- Data is mostly from the city's open data utilization platform 'Data For Citizen'

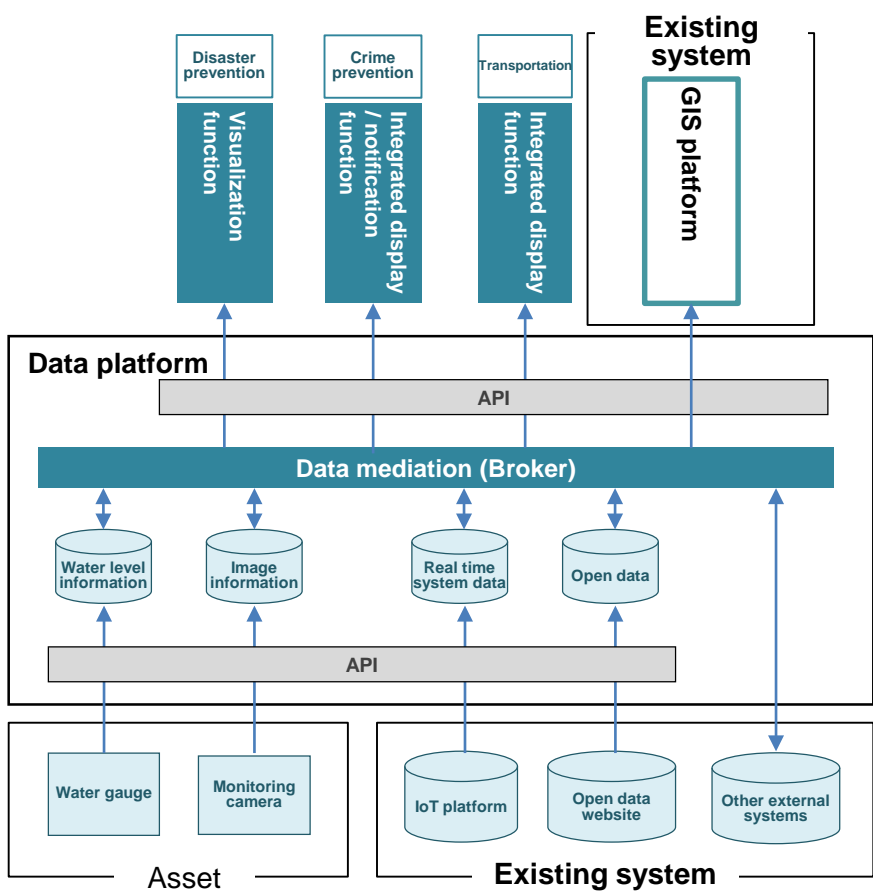
- 'Aizuwakamatsu Plus' is a website that **preferentially displays recommended information** based on **individual attributes** (e.g. the user's age, gender, family structure and interests)
- **Users can use** multiple **one-stop services** by registering **one ID and password.**



* 'The city's open data utilization platform: Data For Citizen' was constructed as a project to promote community development utilizing ICT, which was included in the FY2012 supplementary budget.

○ Reference: Relationship between data platform and local governments' existing systems

- The aim of smart city, ‘Solve various challenges facing cities and regions by utilizing new technologies such as ICT’, is still achieved through the use of data stored in platforms, including open data websites and GIS (geographic information system) platforms.
- These existing systems were developed according to objectives and technology levels at the time of construction and have been individually present; data platform is expected to serve as a guide to effectively use the data of these systems, creating a variety of apps / services.



Relationship between each existing system and data platform	
GIS platform	Existing systems will be able to benefit from data platform if they are modified to collect and display newly installed sensor data from data platform.
• Open data website • IoT platform (real time system data)	Existing systems that local governments have individually developed as silo-type systems, including open data websites and IoT platforms processing real time system data, will become accessible from various services if systems are modified so that each system can register data in data platform.
Other external systems	For examples, systems that the central and local governments have individually installed as silo-type systems and use to provide information, such as water levels of rivers, meteorological data and traffic information, will become accessible from various services if systems are modified so that they can distribute data via data platform.