Changes in the TAPE Concepts due to Digital Technology Innovations in Japan's Local Governments:
Case Studies of Pioneering Initiatives in Kobe and Chiba Cities

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Abstract

The recent digitization and the growing use of artificial intelligence (AI) in government are bringing changes to the traditional concepts of 1) Transparency, 2) Accountability, 3) Participation, and 4) Equity, or TAPE. This paper aims to examine the changes in TAPE resulting from digital technology innovations in Japan's local governments. To this end, the authors conduct multiple case studies of pioneering initiatives implemented in Kobe and Chiba Cities. As a result, 1) regarding transparency, dashboarding in Kobe City has transformed the form of information disclosure from previously hard-to-understand information into information that is easy and intuitively understandable for every citizen. 2) With regard to accountability, the "AI Ordinance" in Kobe City addresses the new accountability required of the black-box nature of AI and its use in decision-making. 3) As for participation, "D-Agree" in Kobe City and the "Chiba Repo" in Chiba City, or online participation platforms, have reduced the constraints of time and space for citizen participation and changed roles of government officials in platform administration compared to previous face-to-face participation. 4) In terms of equity, the "Smartphone Notification Service" in Chiba City identifies necessary information based on citizens' attributes, actively communicates it, and provided opportunities to receive public service benefits, thereby ensuring greater equality. In sum, the digital innovations and initiatives in Kobe and Chiba Cities have further strengthened TAPE concepts, contributing to the enhancement of "Citizens' Autonomy" in the country.

I. Background and Objectives

The digitalization of public administration is a common trend worldwide. In Japan, the Digital Agency of the Japanese Government was established on September 1, 2021, to promote digitalization throughout society. The goal is to realize the vision of a digital society: "a society where people can choose services tailored to their individual needs and realize a diverse form of happiness through the utilization of digital technology—a people-friendly digitalization that leaves no one behind." (Source: Basic Policy for Reforms to Realize a Digital Society) Based on the national government's vision, local governments are working on various measures to promote digitalization, thereby improving public service provision for citizens and the efficiency of internal operations.

The use of artificial intelligence (AI) in public administration has recently increased. The *Handbook on the Use and Introduction of AI in Local Governments*, published in June 2022 by the Ministry of Internal Affairs and Communications (MIC), provides ob-

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https://www.soumu.go.jp/main_content/000754669.pdf

jectives, effects, and cases of AI applications. The handbook classifies the cases into internal operations / resident services x automation / advancement. Examples include

- internal operations x automation: "minutes taken by AI" and "automation of nursery school admission selection";
- internal operations x advancement: "optimization of timing for tax nonpayment reminders" and "early detection of abuse";
- resident services x automation: "automatic chatbot response" and "automatic application form-preparation service"; and
- resident services x advancement: "promotion of evidence-based policymaking (EBPM) through big data analysis" and "health risk diagnosis using AI."

This paper aims to answer the following three research questions:

"How are the previous i) Transparency, ii) Accountability, iii) Participation, and iv) Equity concepts[4)] changing, or how will they change, resulting from these digitalization innovations in Japanese local governments?"

"How are Japanese local governments responding, or how will they respond, to these changes?,"

and "What do changes in each TAPE concept produce in an integrated manner?"

This study aims to clarify these research questions based on the multiple-case method of pioneering initiatives by local governments.

Section 2 summarizes previous TAPE concepts in Japan and extracts the points that this study focuses on. Section 3 presents the research methodology and Section 4 discusses solutions to the research questions by presenting examples of pioneering initiatives by local governments. Finally, Section 5 integrates the results from case studies and presents our findings. In conclusion, we summarize the results and findings, and present the limitations of this study.

II. TAPE Concepts and the Key Points of Our Study

To examine the research questions of how TAPE concepts are changing resulting from technological innovation and how Japanese local governments are responding to these changes, it is necessary to first define how the TAPE concepts are understood at present in Japan. The following is a summary of these understanding. Also, TAPE have been defined in many publications. Although each TAPE concept can be described in a single word, it has several different aspects. For instance, regarding transparency, it generally refers to the government information disclosure to citizens, but the discussion changes depending on where the emphasis is placed. One might emphasize the "subject" of information disclosure, but another might seek for the "content" and/or "volume" of information disclosure. The other might be interested in "process" and/or "timing" of information disclosure. In this section, we also indicate the focal points of this study in each TAPE concept.

A. General Theory: Significance of TAPE in Japan's Context

TAPE concepts, together with decentralization, have guided one of the most important

government reforms in Japan. Since the 1990s, decentralization has been promoted in Japan and has achieved certain results. These include the abolition of the legal hierarchical relationship between national and local governments and the establishment of equal relationships. Additionally, there have been a transfer of tax revenue and financial resources to local governments, the strengthening of management resources such as tax revenue and human resources through municipal mergers, and a reduction in national government involvement.

On the other hand, one critical evaluation (Kawasaki, 2024, p. 26) points out that the decentralization reform has merely developed the relationship between the national government and local governments, strengthening one important principle in Japan's local governance; "collective autonomy." Collective autonomy means that local governments address local affairs autonomously and independently from the national government (Uga, 2025, pp. 2–3). In addition to collective autonomy, decentralization should also strengthen "citizens' autonomy," which refers to local governance based on the decision-making and responsibility of local citizens (Uga, 2025, pp. 2–3). However, the latter aspect of decentralization seems insufficient.

Enhancing government transparency and accountability to citizens, along with promoting citizens' participation or collaboration, will improve the quality of policies. This is achieved by including citizens' knowledge as an input and enhancing citizens' right to self-determination. Thus, enhancing TAP in TAPE concepts in local governments leads to the strengthening of "citizens' autonomy."

Another critical evaluation (Kawasaki, 2024, pp. 22–23) of decentralization is that these reforms have promoted competition among local governments. This competition has resulted in widening financial and other disparities, as well as differences in the services provision to citizens. In this context, it is particularly important to reduce disparities in public services among citizens. The importance of Equity in TAPE concepts has also been recognized. In summary, the TAPE concepts are significant for strengthening citizens autonomy, which was insufficient in decentralization reforms, and for correcting disparities caused by competition between local governments that was promoted as a result of decentralization reforms in Japan's context.

B. TAPE Separately Discussed for Extracting Points to Focus on in This Study

1. Transparency

Transparency, according to Soga (2022, p. 340), refers to "the information provided about the government" and "the degree of public disclosure." To achieve this objective, it is essential to establish a formal record management system and an information disclosure system that manage the creation and storage of information. Here, transparency is defined in terms of "content," "volume," and "subject of disclosure."

Nakamura (2007, p. 19) describes transparency as "the extensive disclosure of information related to public administration, making the process of formulating and imple-

menting policies transparent to all." In addition to the "content," "volume," and "subject of disclosure" of administrative information, the "process" of administrative activities and the "form (method)" of information disclosure, which should be easy to understand and visible to all, are also presented as requirements for transparency.

In addition, the MIC's White Paper on Public Finance (FY2006)[5] also states that "prompt and easy-to-understand" public disclosure is to be achieved through "the use of information technology" to ensure transparency. In other words, it focuses on the "timing" and "form" of information disclosure and links them to information technology.

In recent years, with the rise of EBPM, the idea of transparency of "evidence," or citizens being able to trace the data as a basis of policymaking, and its impacts on policy trust has also emerged (Ohashi, 2020, p. 9).

A similar concept is adopted in other countries as well. It is generally found that "the degree of transparency" is defined by "openness." The openness is classified into several elements: "when (timing of disclosure)," "what and to what extent (scope of disclosure)," "to whom (subject of disclosure)," and "how (form of disclosure)." This is nearly identical to Japan's transparency requirements.

To summarize, transparency refers to the requirements of "content," "volume," "subject," "process," "form," and "timing" of information to be disclosed. Efforts to improve each of these requirements have been promoted mainly through the use of information technology.

This paper focuses particularly on the "form" of information disclosure among several aspects. The question is "how information can be disclosed in easier-to-understand forms with the latest digital technology innovations". This includes extending existing information disclosure of paper media (agency PR flyers, etc.) and web pages, which have long been used to improve transparency.

2. Accountability

Accountability originally means "the ability to explain that government activities are being carried out in accordance with the mandate of the people" (Yamatani, 1997, p. 187). Akiyoshi et al. (2020, p. 241) commented on Yamatani's explanation, stating, "accountability has greatly expanded in scope in recent years. Elementary accountability concerns legality and procedural compliance, questioning whether appropriate means are used. This has expanded to include efficiency and effectiveness recently." In other words, the "content" of accountability has expanded from the original "process", such as "legality" and "procedural compliance," to "outcomes", including "efficiency" and "effectiveness."

This idea is similar to those found in other countries. Osumi (1999, p. 94) stated that "accountability is not uniform in terms of what it refers to," and then listed the following types of accountability as presented by Stewart (Stewart, 1984): The first is whether

the organization complies with laws, regulations, and rules. The second is whether effective means are chosen in decision-making (accountability for the process). The third is whether the program is implemented economically and efficiently (accountability for performance). The fourth is the establishment of goals for the program itself and its effectiveness (accountability for the program). The fifth is the degree of achievement of policy goals and the adequacy of the policy itself (accountability for the policy itself).

In summary, accountability involves explaining to "the public" regarding "processes" such as "legality," "procedural compliance," and "effective means in decision-making," as well as the "outcomes" such as "economy and efficiency" and "effectiveness." This study focuses on the "process" of selecting effective means of decision-making.

3. Participation

Participation means "the participation of citizens in efforts initiated by the government" (Abe, 2022, p. 3). Nakamura (2007, p. 20) also stated that "in public administration, substantial participation—not formal participation—is significant," and that it is desirable for citizens to participate in all stages of policy planning, implementation, and evaluation.

In the past, citizen participation was regarded as synonymous with the government taking into account the opinions and demands of citizens (Odagiri, 2017, p. 144), and whether to reflect them in policies was left to the judgment of the government. In Japan, the Great Hanshin-Awaji Earthquake of 1995 triggered an upsurge in civic activities. In 1998, the Law for the Promotion of Specified Nonprofit Activities (Act No. 7 of 1998, commonly known as the "NPO Law") was enacted, and citizens came to be recognized as public actors (Odagiri, 2014, p. 12). In addition, systems related to citizen participation were developed, such as the public comment system enacted in 1999 and the certified NPO system. Against this backdrop, citizens' more active involvement and collaboration, which require an equal relationship between them and the government, are being actively promoted beyond the conventional citizen participation.

One of the most widely cited typologies of citizen participation is Arnstein's (1969) "ladder of participation." Arnstein classifies citizen participation into eight stages: (1) manipulation, (2) therapy, (3) informing, (4) consultation, (5) placation, (6) partnership, (7) delegated power, and (8) citizen control.

In addition, the International Association for Public Participation's spectrum of citizen participation[6] categorizes the stages of citizen participation as follows: (1) inform, (2) consult, (3) involve, (4) collaborate, and (5) empower. It also defines the "public participation goals" and "promises to the public" associated with each stage.

This paper focuses particularly on the "object" of the participants from the citizens' side, and on the "role" of the government from the government's side.

The "object" of participants can mean two things: First, innovations in digital technology may make it possible to obtain a greater number of participants with fewer restrictions on participation. Second, there is essentially a trade-off between the number of participants and the "burden on citizen participation." If the burden on citizen participation is small, it is possible to obtain the participation of a large number of citizens. However, if the burden is large, the number of participants will generally be small. In this situation, innovations in digital technology may reduce the burden on participants and increase their number, even to higher levels of participation, such as in collaborations.

Regarding the "role" of the government, local government officials will be required to play a different role from that in the past owing to innovations in digital technology. Governance on the platform of citizen participation has been required in the past, but innovations in digital technology, particularly in AI facilitation, mean that a different and more advanced governance capability will be required for local government officials.

4. Equity

Equity is "treating things that are equal equally." It is also "treating things that are not equal non-equally"; the former is called horizontal equity, and the latter is called vertical equity. Equality is a concept similar to, but not identical to, equity. Equality is understood to be "treating things equally regardless of whether they are equal or unequal." (Akiyoshi et al., 2020, p. 105)

Akiyoshi et al. (2020, pp. 106–109) state that "in public policy, equity is required when distributing something" and that it has three dimensions. The first is "who the recipients of the distribution are." He stated that the important questions are to whom the distribution should be made and to what extent it should be equitable. For example, as in the case of affirmative action, the intent is to focus on race and gender and set aside a certain percentage in advance for these groups to remedy their historical disadvantages and inequities. The second is "what is to be distributed." It may be more equitable to distribute items according to individual and community needs than to distribute the same items equally. For instance, it would be fair to provide scholarships to students who have financial difficulties. The third is "what the distribution process is." Even if equality of outcome is not achieved, the equity may be ensured by maintaining equality of opportunity.

In this paper, among these elements of equity concept, we focus on the equity of "process" based on "equal opportunity." Equal opportunity states that opportunities should be granted equally. In Japan, because of the application-based public service system, those who are unaware of the system or the need to apply will miss the opportunity to receive benefits. This is often the case for socially vulnerable individuals. In this context, the question is "how to ensure equity in obtaining the information necessary for application through innovation in digital technology." This is a prerequisite for providing administrative services that are equally suited to individual attributes, which

naturally differ across household and income status.

In summary, each TAPE concept is composed of various aspects, but in this study, we focus on "Form" in Transparency, "Process" in Accountability, "Object" from the citizens' side and "Role" from the government side in Participation, and "Process" in Equity.

Ⅲ. Research Methods and Materials

A. Research Methods

To address the above research questions, this study adopts a multiple-case method. We examine pioneering cases involving local Japanese governments. Executives in charge of digital promotion in each selected municipality served as co-authors.

B. Case Selection

As shown in Table 1, we selected Kobe City's approach for (i) transparency and (ii) accountability, both cities' approaches for (iii) participation, and Chiba City's approach for (iv) equity.

The most significant similarity between the two cities is that they promote Japan's first initiatives related to (i)–(iv). The details are presented in Section 4. As for transparency, Kobe City has been externally disclosing "dashboards using a business intelligence (BI) tool (Tableau)" since February 2023. Regarding accountability, in light of the progress of AI utilization, Kobe City was the first city in Japan to "enforce a comprehensive AI ordinance" (rule development) in March 2024. For participation, "D-Agree," an online platform utilizing AI facilitation for consensus-building, was formally introduced after a demonstration experiment in April 2023.

With regard to participation, Chiba City is the first city in Japan to establish a system called "Chiba Repo," in which citizens report on local issues occurring in the city using ICT to share issues and solve them collaboratively. This system was introduced in September 2014. Regarding equity, the Smartphone Notification Service "For You," a push-type notification service tailored to the attributes of eligible citizens, was launched for the first time in Japan in January 2021.

Both have similarly large populations, as they are government-designated cities.[7] Both are strongly promoting digitalization in all policy areas through the government's "Smart City" vision.

Table 1: Pioneering Initiatives of Kobe and Chiba Cities in Each TAPE Concept

	Municipality	Pioneering Initiatives
(i) Transparency	Kobe City	Dashboards utilizing BI tools
(ii) Accountability	Kobe City	Comprehensive AI ordinance enforcement
(iii) Participation	Kobe City	Initiatives to exchange opinions and consensus-building among citizens and public administration bodies through online platforms
	Chiba City	Mechanisms for sharing and resolving local issues through citizen participation by utilizing smartphones
(iv) Equity	Chiba City	Smartphone notification service tailored to target citizens' attibutes

Source: Authors

C. Analytical Framework

Figure 1 illustrates the analytical framework used in this study. For each TAPE concept, the pioneering initiatives of Kobe City and Chiba City are shown. We present the research questions on how TAPE concepts are changing owing to innovations in digital technology and the direction of the response to these changes as solutions based on pioneering initiatives.

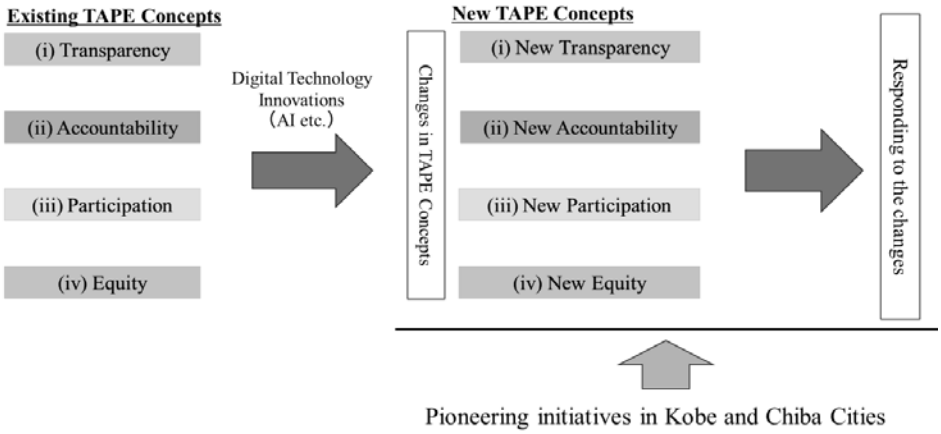

Figure 1: Analytical Framework

Source: Authors

IV. Pioneering Initiatives by Local Governments

A. Initiatives in Kobe City

1. Dashboards Using BI Tool (Tableau) ([i] Transparency)

a. Pioneering Initiatives

Since June 2022, the City of Kobe has been sharing dashboards using a BI tool (Tableau) within the agency on the agency portal site "Kobe Data Lounge" (about 90 dashboards, see Matsuo 2023 for detailed initiatives). A dashboard is a screen that visualizes multi-

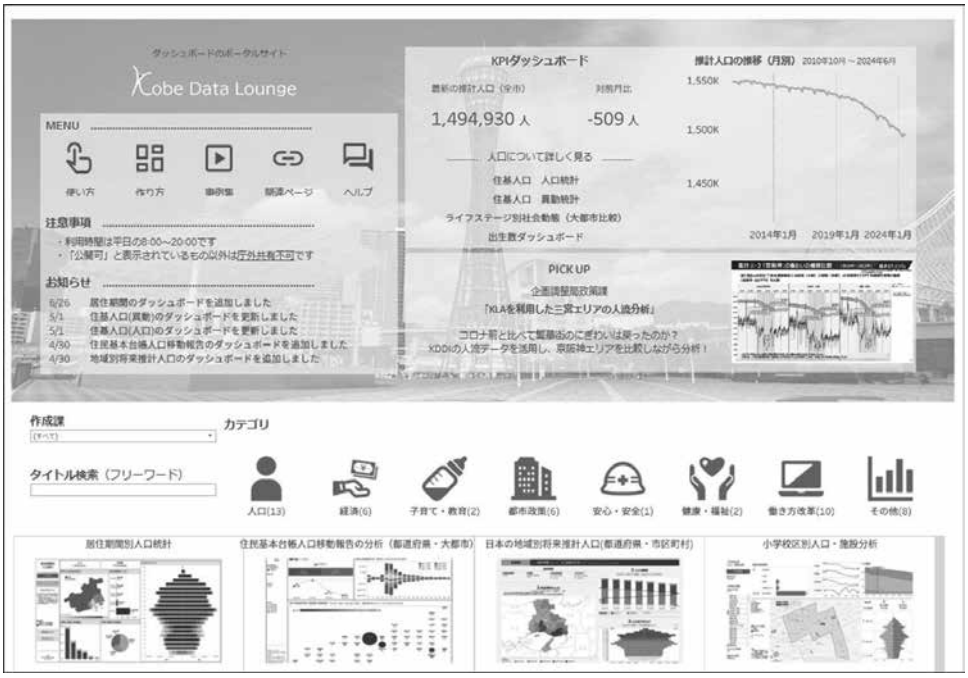

Figure 2: Kobe Data Lounge

Source: Authors

ple data items, similar to an automobile instrument panel. Data can be analyzed from various perspectives such as region, gender, or age group. With a dashboard, users can seamlessly drill down into the data based on their focus. For example, they can click on a region if interested in a specific area or filter for a specific age group.

The dashboards shared within the agency in the Kobe Data Lounge are based on open data, such as regional population pyramids from the census conducted by the Statistics Bureau of the MIC. They also include Kobe City's own data, such as the status of building permit application with the Building and Housing Bureau. Kobe uses these data for various policymaking purposes. For example, the city compares regional population pyramids with the status of building permit applications for new housing and examines plans for the development of daycare centers by assessing the demand.

In addition, since February 2023, some dashboards that were shared within the agency in the "Kobe Data Lounge" have been available on the "Kobe Data Lab" website. These dashboards, as mentioned, are based on open data, such as the census conducted by the Statistics Bureau of the MIC and future population estimates by the National Institute of Population and Social Security Research. Both the census and population estimates are published by the national government, for the entire country, not solely for Kobe City. Creating a dashboard requires almost the same time and effort regardless of

Figure 3: Kobe Data Lab

Source: Official website of Kobe City[8]

whether for a single city like Kobe or for all municipalities in the country. Therefore, to present this information in a more accessible format, Kobe City created a dashboard of nationwide data (Figure 3).

b. Changes in the TAPE Concept

Until now, Kobe City has created dashboards showing regional population structures and future population estimates for internal use within the city government and has used these dashboards to study various policies. The "Kobe Data Lab" is an attempt to open these dashboards to the public, rather than keeping them restricted to the city government, and can be seen as an effort to improve transparency.

In fact, the dashboards released by Kobe City through the Kobe Data Lab are based on the National Census and Population Estimates from the National Institute of Popula-

tion and Social Security Research, which were originally publicly available open data. In this sense, from the perspective of the "content" that is publicly available, it may not be evaluated as a new initiative to improve "transparency."

However, although the Population Census of the Statistics Bureau of the MIC and the Population Projections of the National Institute of Population and Social Security Research are "open data" and accessible to anyone, they are presented as large tables or figures, which are difficult to understand. Creating a dashboard similar to Kobe City's would have required a great deal of time and effort. On the other hand, now that the Kobe Data Lab has made the data available in a dashboard format, citizens can better understand the publicly available data with little additional effort, contributing to the expansion of the citizens' right to self-determination, which is the goal of "transparency."

This may call for a transformation of the concept of "transparency." As summarized in Section 2, this study focuses on the "form (method)" of "transparency." By creating dashboards of open data, Kobe City not only made them public but also transformed them into an easy-to-read format and infographics through BI tools, making them intuitively understandable to anyone. In other words, while "transparency" to date has focused on the "content" of what can be accessed, the Kobe Data Lab can be evaluated as an attempt to further improve the "form (method)" in which it can be accessed. For "transparency" to be effective, not only must a certain fact be accessible to citizens, but it must also be truly and readily accessible to citizens.

This is precisely what digital technology has made possible. Low-code tools that allow the intuitive handling of data without programming skills have become popular in recent years. Kobe City's dashboards use the low-code tool Tableau, a BI tool. In addition, Kobe City has created dashboards of data not only for Kobe City but also for the entire nation. This scalability is also a characteristic of digital technology. In this way, innovations in digital technology can be evaluated as making "transparency" effective by making information accessible to citizens with ease.

c. Responding to the Changes

In the name of "transparency," a variety of information, documents, and data have been released to the public, but many of them may have only been made available in a way that requires significant time and effort for citizens to use. However, as demonstrated in the dashboard efforts, there is a significant gap between making data available in a way that requires effort to use and making it truly accessible and usable for citizens. Currently, there are various ways to make information available to citizens, including the use of BI tools, which can be scaled up without significant additional costs. Therefore, when disclosing information in the digital society, it is necessary not only to make information available but also to present it in a "form (method)" that is visually-easy for citizens to use.

2. Enforcement of Comprehensive AI Ordinances ([ii] Accountability)

a. Pioneering Initiatives

In light of the progress in AI utilization, Kobe City enacted the "Kobe City Ordinance on the Utilization of AI" in March 2024, marking the first comprehensive set of rules for AI utilization in Japan. Kobe City is actively promoting the use of AI and other advanced technologies, aiming not to curb their use but to encourage their effective and safe application under specific rules.

The City of Kobe is already utilizing AI in various ways. For example, since February 2024, it has made Microsoft Copilot, a generative AI, available to all employees. Its uses include idea generation (e.g., planning suggestions, identifying gaps in notification reviews), programming support (e.g., code explanations), foreign language translation (e.g., translating emails to and from foreign countries), and persona analysis (e.g., assessing citizens' awareness and understanding of policies). In addition, for multifaceted information gathering in disaster response, the city has introduced a system that automatically collects, analyzes, and visualizes real-time data related to crises (e.g., damage from fires, accidents, and natural disasters) posted on social media utilizing AI technology.

In both domestic and international cases, AI has been used as a decision-making factor in administrative penalties, significantly impacting the public. In the Netherlands, for example, improper payments were observed in the child allowance application system. An AI system was introduced to check for fraudulent payments in the child allowance application system. The AI system studied past patterns of fraudulent recipients and used nationality and ethnicity as indicators to judge fraud. Based on the AI's computation of misjudgments, the administrative body issued refund instructions to approximately 26,000 people, resulting in numerous bankruptcies, family breakups, and even suicides due to economic hardship. A parliamentary investigation committee was convened and concluded that the notice that recipients received unfair benefits was erroneous, leading to the resignation of the cabinet.

b. Changes in the TAPE Concept

"Accountability" is defined in the "Guidelines for AI Operators (Version 1.0)," published on April 19, 2024, by the MIC and the Ministry of Economy, Trade and Industry. It is distinguished from "transparency" with respect to information disclosure and is described as "a concept concerning the assumption of factual and legal responsibility for AI and the development of preconditions for assuming such responsibility" (p. 18). Among them are, for example, a) "ensuring that the sources of data and the decisions made during the development, provision, and use of AI systems and services can be traced back to the extent technically possible and reasonable" (improving traceability); b) "establishing a responsible person for accountability at each entity" (clarifying the responsible person); and c) "clarifying where responsibility lies by means of contracts and social commitments (voluntary commitments) among the entities involved, including non-business users" (distribution of responsibility among the entities involved).

As seen in Section 2, accountability is a concept with a long history, even before the advent of AI, and the above-mentioned "clarification of the responsible person" and "distribution of responsibility among the parties involved" are not necessarily issues specific to AI. Additionally, "improving traceability" has been referred to as "process accountability" in the past, but a unique point of contention with AI is that AI-based decision-making can easily become a black box on two fronts.

The first is the black-box nature of the AI itself, meaning the reasons AI provides for its conclusions. In the past, when a certain system was used for decision-making, it was simply a program that followed an algorithm written by a human based on logic. Therefore, when a problem occurred, it was easy to clearly distinguish which part of the program was the problem and, consequently, whose responsibility it was. However, with AI techniques like deep learning, it is unrealistic, if not theoretically impossible, to trace the logic that leads to its conclusion. For example, it is almost impossible to definitively determine why ChatGPT produces a particular result, even though it can be inferred from the training data.

The next is the black-box nature of AI utilization, meaning how (or whether) people use AI judgments in decision-making. It is people who utilize the results of AI judgments and make the final decisions based on them. However, if a problem arises, it is not always clear whether the responsibility lies with the AI (that is, with the AI developer) or with the AI user.

Thus, due to the black-box nature of AI utilization on these two fronts, the division of responsibility is blurred, making accountability problematic and in need of addressing.

c. Responding to the Changes

Therefore, based on the importance of ensuring accountability in the use of AI, Article 3 of the Kobe City AI Ordinance sets forth the principles on which Kobe City should base its actions. Item 6 states, "Recognizing that AI has the potential to affect the rights and interests of citizens, the city shall *clarify where the responsibility for its use lies* and to be mindful of fulfilling their responsibilities to the citizens." (authors' italics).

Article 6 of this ordinance states that risk assessments should be conducted for administrative dispositions. Risk assessment, as stipulated in the ordinance, involves "evaluating the possibility and magnitude of the impact of the use of AI on the rights and interests of citizens" and "examining methods to reduce harm to the rights and interests of citizens as much as possible while making administrative operations more efficient." The specifics of the risk assessment are still under consideration as of August 2024; however, the assessment will focus on confirming whether the city's use of AI will be performed in accordance with these basic principles. For example, Kobe City and the related parties will establish a person responsible for accountability, and the evaluation will consider whether the responsibilities of these parties have been clearly defined.

The objective is not only to evaluate the AI itself, such as the type of training data used, but also to evaluate the operational aspects on the human side, such as whether the system is designed to allow staff to make the final decision. It is essential for city officials to recognize the risks of AI and establish a system to deal with them.

3. Initiatives to Exchange Opinions and Build Consensus among Citizens and Public Administration Bodies through Online Platforms ([iii] Participation)

a. Pioneering Initiatives

In collaboration with AGREEBIT Corporation, Kobe City launched D-Agree, an initiative to exchange opinions and build consensus among citizens, using an online platform. AI not only manages risks by filtering out flaming arguments, but also statistically analyzes the gathered opinions, extracting, structuring, and analyzing the content of discussions. Participants can then discuss these issues further based on the results.

Kobe City can obtain citizens' opinions in advance of important policies that are closely related to citizens or attract a high level of attention. This allows the city to ascertain the percentage of approval or disapproval of such policies and determine whether the policy is feasible to implement, as well as any modifications that need to be made.

b. Changes in the TAPE Concept

In the past, there were also opportunities for citizens to express their opinions and participate in discussions about the city government, both in person and online. However, these discussions were facilitated by local government officials, whereas in D-Agree, they are facilitated by AI.

This study introduces the efforts on "participation" in both Kobe City and Chiba City. In Kobe City's initiative, we examine participation from the facilitation-role perspective of the local government, rather than from the citizens' perspective.

The first is the need for a new facilitation method based on the division of roles between people and AI. The second involves the new challenges created by the transition from face-to-face to online platforms.

AI can do three main things. First, it can facilitate online discussions. Second, it performs a quantitative text analysis of all opinions, extracts frequently occurring words, constructs a co-occurrence network, and visualizes the relationships between frequently occurring words. Third, it provides a voting function to visualize the percentages of agreements and disagreements.

However, AI has certain limitations. First, it cannot make value judgments. It cannot decide whether opinion A or opinion B is more important. Second, it cannot make decisions. AI can aggregate the opinions of citizens and organize the results of voting but cannot make final decisions. Third, it cannot perform place setting and management. Place setting refers to deciding who is allowed to participate in a discussion and under

what rules. The management of the forum aims to ensure smooth relationships among participants, ensure their psychological safety, and lower psychological hurdles for expressing opinions. This must be done by the people. In other words, the new facilitation method required due to the use of AI must be carried out by local government officials.

Second, the change from face-to-face to online platforms has created new challenges. First is the demographic bias of the participants. In particular, there is an age bias, with the elderly participating less frequently than the younger group. Second, citizens' positive or negative opinions will be mixed if anonymity is allowed. Third, the administration faces an unprecedented burden in extracting essential opinions from among many opinions, which overlaps with the second point. Conversely, it is possible that the discussion will be completely inactive and that only few opinions will be expressed.

Given these challenges, it is still difficult to utilize AI-based online platforms like D-Agree as primary tools for consensus building and decision-making. It still remains a reference or supplementary tool for checking citizens' reactions to a certain policy proposal.

c. Responding to the Changes

Thus, we discuss how people will take on new facilitation roles that cannot be undertaken by AI and how AI will be utilized as a reference and supplemental tool now and in the future.

The first point is that local government officials need the same competencies on the online platform as they had in previous face-to-face participation. On a face-to-face platform, local government officials need governance competencies and the ability to set up and manage the platform. For instance, they can select appropriate participants, set discussion rules, facilitate relationships among participants, mediate conflicts, foster networking, and provide necessary support (e.g., knowledge, information, funds, technology, and opportunities). These are capabilities that AI cannot provide, and they remain required of local government officials, even on online platforms.

However, governance on online platforms requires more sophisticated and advanced capabilities. For example, it is not possible to express opinions anonymously in person, but it is possible to do so on an online platform. Therefore, it is necessary to manage the forum and handle opinions, including those of anonymous participants. It is also necessary to maintain an appropriate balance as to whom to include when setting up and managing a forum. In person, the best that could be done was to be inclusive of all parties involved. An online platform, however, allows for participation by a diverse range of participants from all over the city, nation, and world if the participants are not narrowed down.

One aspect of this is that a more diverse range of opinions may stimulate discussion, but on the other hand, a diverse range of participants may also increase the likelihood

of the discussion becoming controversial, creating conflicts among participants. Conversely, narrowing the number of participants increases the likelihood that the discussion will be stable but may result in less diverse and flexible opinions being expressed. In this case, an appropriate balance is required to limit or expand participation in line with the purpose of opinion exchange.

Alternatively, there is the question of how strict the rules should be. If the rules are strict, it will be relatively easy to manage the forum; however, this may hinder the free exchange of opinions, and participants may become less motivated. However, if the rules are loosened, free and innovative opinions may emerge, which may increase the possibility that the discussion will deviate and fail to achieve its objectives.

Given these considerations, the creation of online platforms in local governments to promote public participation requires a higher level of governance capacity among local government officials and should be pursued in combination with strengthening such capacity.

B. Initiatives in Chiba City

1. Mechanisms for Sharing and Resolving Issues through Citizen Participation ([iii] Participation)

a. Pioneering Initiatives

Chiba City's initiative, "My City Report" (hereinafter referred to as "Chiba Repo"), started its operations in 2014 (Figure 4). It was the first of its kind in Japan.

For example, roads may become dilapidated, potholes may appear, or park benches may break. Therefore, the city government conducts patrols to inspect the facilities, but visiting all the facilities and equipment in Chiba City is daunting. Citizen participation

Figure 4: Chiba Repo

Source: Publicity Flyer of Chiba City

can help address this problem. Citizens use roads and parks in their daily lives. If they notice a hole in the road or a broken bench in the park, they can use the "Chiba Repo" application to report the issue with photos and location details. This type of report is called a "Komatta Report" (trouble report) in Chiba Repo.

There are 981,909 Chiba citizens, of whom 8,922 (as of March 31, 2024) are registered with this initiative, meaning that roads and parks are being checked by 17,844 eyes. The number of reports sent amounts up to 19,956.

Some local issues can be easily solved by the citizens themselves without requiring intervention from the city government. For example, if garbage is dumped in a park, the citizens can clean it. If they solve the problem themselves, they can send in a "Solution Report."

The reporting method is the same as in the Komatta Report, but "before" and "after" photos need to be registered. For example, the "before" photo shows the litter, and the "after" photo shows the area after it has been cleaned. An example would be "I found trash in the park, so I cleaned it up myself." The number of local problems solved by citizens in this way amounts to as many as 3,478 cases.

b. Changes in the TAPE Concept

Citizen participation has been promoted by local governments throughout Japan. For example, there have been public comments, workshops, and publicly recruited committee members. Public comments require citizens to read and comment on a large draft of an administrative plan, whereas workshops and publicly recruited committee members require face-to-face participation, both of which place a heavy burden on citizens. Therefore, there was a tendency for participation to be skewed toward segments of the population with relatively more free time.

In contrast, the Chiba Repo program, which allows people to participate easily via smartphones at their convenience, attracted 8,922 participants or approximately 1% of the population. It is rare for 1% of the population to participate in a project, and the use of digital technology has helped secure a large number of participants, a segment that has traditionally been difficult to reach.

Participants were surveyed annually, and the results of the January 2024 survey showed that 57.9% responded that "there was a change" or "there was rather a change" in their awareness of the city. A respondent answered,

> The appeal of Chiba Repo is that citizens can easily report issues while commuting to work or taking a walk. Citizens don't have to worry about whom to contact for reporting issues. It is also convenient to check the progress of an issue through the application. I feel more aware that I am participating in the city's development, and my "love for Chiba City" is on the rise.

On the other hand, the easy use of the system has led to a large number of reports, but there are limited administrative resources available to respond to these reports.

c. Responding to the Changes

Therefore, it is desirable to increase the number of "practitioners" who send in "Solution Reports" on their own issues, rather than "reporters," those who just send in "Komatta Reports." Chiba City is actively promoting the program among the younger generation and is holding lectures at high schools.

Citizens themselves are involved in solving problems in the city, such as picking up trash in parks and cleaning water catch basins. This leads to a shift to a higher level of participation, moving up the "ladder of participation" (Arnstein, 1969, p. 217) to (7) delegated power, and the International Association for Public Participation's "spectrum of citizen participation" to (5) empower, which leads to deeper "citizens' autonomy."

2. Smartphone Notification Service Tailored to the Target Citzens' Attributes [iv] Equity

a. Pioneering Initiatives

Another pioneering initiative, the first of its kind among Japanese local governments, is the Push-type Notification Service "For You" ("Friendly Online Reminder Service of Your Own Useful Information") (Figure 5). This service began operating in 2021 and is available to all citizens.

In general, those who are busy with work and childcare do not have sufficient time to search for information on administrative services. It is unfair that there is a difference in the services enjoyed by citizens who are able to learn about the existence of administrative services and those who are unable to do so. Because the public service system is based on the principle of application, the decision to apply for a service depends on the will of the citizens concerned; thus, the opportunity to obtain information

Figure 5: Smartphone Notification Service "For You"
Source: Publicity Flyer of Chiba City

itself must be fair.

In response, Chiba City has introduced a service that uses the city's resident information (household information, income information, etc.) to notify citizens who may be eligible for various benefits and health checkups individually via LINE (a messaging app popular in Japan) or email to reduce the burden on citizens to search for and inquire about receiving various benefits and health checkups. This notification service is intended to prevent omissions in applications and the receipt of benefits.

Citizens who have registered to use the service will receive a LINE or an email notification of the 29 administrative services they may be eligible to receive, based on their attributes. These services include Japanese encephalitis (second stage) immunization, pneumococcal vaccination for the elderly, postpartum care services, dental checkups for expectant and nursing mothers, health welfare handbook for the mentally disabled, medical care for services and supports (outpatient mental healthcare), child welfare allowance for mentally and physically disabled children, special child support allowance, child support allowance, medical expense subsidy for single parent families, discount system for JR regular train tickets, dispatch of family life support workers, welfare funds for mothers, fathers, and widows, reduction or exemption of water charges, reduction or exemption of sewerage charges, and time-limited move-in to municipal housing to support child-rearing households.

The message to be sent is, for example, "This is Chiba City. You may be eligible for a child support allowance. Please contact the Child and Family Division. For more information, refer to our website."

b. Changes in the TAPE Concept

When the government decided to provide a special fixed benefit of 100,000 yen to all citizens in 2020 as a measure against COVID-19, 340,000 households did not apply for it. Those who did not apply of their own volition were unaware of the system itself and did not know that they needed to apply, thus missing the opportunity to do so. In general, the more socially vulnerable a person, the more likely they are overlooked.

Equity is one of the most important principles in public administration. "Equity in obtaining information" can also be called "equity in granting the opportunity to apply." In the past, sending notification documents or uniformly informing the public through public relations newsletters may have achieved equity in obtaining information. However, today's digital society, where pinpoint-targeted advertisements are routinely sent to smartphones, requires a transformation in how information is provided.

c. Responding to the Changes

Furthermore, even if information is pinpointed according to attributes and application opportunities, administrative procedures, such as subsequent applications and notifications, are still necessary. There are people for whom applying by themselves is physi-

cally impossible, and there are limits to "equity in the enjoyment of services."

Therefore, further studies are required. In Japan, the general principle is that individuals must apply for services. However, if the information held by the government is linked and the criteria are met, services can be received automatically without having to apply for them. In other words, there has been a shift toward a smart push-style administrative service system based on the use of data.

V. Integration of Findings

We have examined the three research questions: "How are the previous i) Transparency, ii) Accountability, iii) Participation, and iv) Equity concepts changing, or how will they change, resulting from these digitalization innovations in Japanese local governments?" "How are Japanese local governments responding, or how will they respond, to these changes?," and "What do changes in each TAPE concept produce in an integrated manner?" This study conducts multiple case studies of the pioneering initiatives of Kobe City and Chiba City. Table 2 presents the synthesis of the results from these two initiatives. On the vertical axis, there are examples of both cities corresponding to each TAPE concept, and on the horizontal axis, "points to focus on in each TAPE concept," "previous TAPE concepts," "changes in TAPE concepts due to technological innovation," and "responding to the changes" are described.

During our discussion, we have also added new items with reference to Nakamura's table (Nakamura, 2007, p. 63). In each case, in addition to the change in each TAPE concept, there was significance in terms of "Improvement of administrative management." Therefore, "Direct effects," "Positive effects," and "Negative effects" are listed. These indicate the degree of improvement, both positive and negative, mainly in terms of changes in operational efficiency, administrative burden, and effectiveness.

The "final effect" is also described. This indicates that, as a larger concept, the principal aspects such as "Citizens' Autonomy" have also been strengthened. As indicated in "II. TAPE Concepts and the Key Points of Our Study" and particularly "A. General Theory: Significance of TAPE in Japan's Context," the transparency and accountability of the government to the citizens, along with the promotion of participation and collaboration with them, will improve the quality of policies by including their knowledge as an input. This will "enhance citizens' right to self-determination," which in turn will lead to the strengthening of "citizens' autonomy."

There is another final effect. The equalization of application opportunities has reduced the disparity in public services provided to citizens, ultimately contributing to equal benefit outcomes. In other words, strengthening the concept of equity ensures uniform public services provision among citizens.

In the case of both cities in this paper, the result of responding to the changes in each TAPE concept has further strengthened "citizens' autonomy" and "service equali-

Table2: Integrated Findings

TAPE concept	In concept point of focus	Case			Changes in the TAPE concepts and responding to the changes		
					Changes in the TAPE concepts		Responding to the changes
		Municipality	Case	Technology	Previous	Changes due to technological innovation	
Transparency	The "form (method)" of information disclosure; how the information is disclosed.	Kobe City	Dashboards	BI Tools	The "hard-to-understand" publication that only lists a large number of figures in a tabular format (with only access to the information possible).	Dashboarding has changed the information into something that everyone can intuitively understand in an "easy-to-understand" manner (easy access to information).	Not only to simply disclose information, but also to disclose it in a "form" that is easy for citizens to use and understand by making full use of a variety of administrative data with few costs.
Accountability	Accountability for the "process" of selecting effective means for decision-making		AI Ordinance	AI	Explanation of the effective means chosen in decision making	The following two items were added to the previous concept: i) What kind of data does AI use to reach its conclusions (black box nature of the AI itself)? Ii) How do people use AI's judgments in decision making (black box nature of AI use)?	Clarify responsibility for the use of AI. Conduct risk assessment for administrative dispositions using AI: i) Evaluate the possibility and extent of impact on the rights and interests of citizens, and ii) Study methods to reduce harm to the rights and interests of citizens as much as possible).
Participation 1	ii)"Role" of government in public participation"		D-Agree	AI	Participants are mainly selected by the government, and the places where they can participate are limited. Local government officials facilitate participation, present data, and gather opinions.	The participants can now participate anonymously from all over the world. AI facilitates, presents results of text analysis, visualizes the ratio of approval or disapproval, and consolidates opinions.	Local government officials will be required to take on more advanced roles in the governance of online platforms for public participation, including setting up and managing the forum.
Participation 2	i)"Object" of public participation	Chiba City	Chiba Repo	Smartphone	In principle, face-to-face participation is required, which places a heavy burden on citizens and tends to bias participation toward those who have relatively more time to spare.	Because it is easy to participate with a smartphone, a segment of the citizens that had previously difficulty participating is now participating (approx. 1% of the city population).	The number of "collaborators," or higher stage of participation, who send "solution reports" as their own issues will increase, instead of sending "komatta report"
Equity	Equity in "process" based on "equal opportunity," meaning benefit opportunities should be granted equally.		Notification Service	Smartphone	Those who were unaware of the system and those who were unaware of the need to apply will miss the opportunity to receive public service benefits (often among the socially vulnerable). Publicize the program in print media, such as PR govt. magazines, to provide information and opportunities to apply and ensure equal opportunities.	Pinpoint necessary information to citizens based on their attributes, and provide them with opportunities to apply, further ensuring equal opportunities	The government system will be further transformed by linking information held by the government, so that if a citizen meets the criteria, he/she will automatically receive services without having to apply for them.

TAPE concept	Case			Improvement of administrative management		Final effect
				Direct effects		
	Municipality	Case	Technology	Positive effects	Negative effects	
Transparency	Kobe City	Dashboards	BI Tools	Effective disclosure of evidence as the basis for policy In addition to Kobe City, nationwide data is dashboarded and made publicly available.	Administrative burden for dashboard renewal	By fostering an environment in which citizens themselves can deepen their understanding of policies and actively participate in the policy process, there will be more opportunities for citizens' knowledge to be reflected in policy input, thereby improving the quality of policies. Furthermore, citizens' autonomy will be strengthened.
Accountability		AI Ordinance	AI	AI supports efficient and effective decision-making in administration.	AI utilization creates the possibility of erroneous decisions.	
Participation 1		D-Agree	AI	The hurdle to participation is lowered and the number of participants increases. AI provides a wealth of information to deepen discussion.	Uneven opportunities for participants (e.g., many young people) Increased administrative burden due to mixed good/bad opinions, etc.	
Participation 2	Chiba City	Chiba Repo	Smartphone	Reduce the hurdles to participation and increase the number of participants Labor saving in administrative activities for facility and equipment maintenance	A large number of reports are submitted and the government cannot keep up with the response.	As the number of citizens who see local issues as their own concerns and solve them on their own increases, the stage of citizen participation will shift to a higher level, and citizens' autonomy will be enhanced.
Equity		Notification Service	Smartphone	Achievement of application recommendation according to the attributes of the target citizens (equity in granting application opportunities).	Generation of administrative needs (request for a push-type administrative system).	Equal opportunity to apply reduces disparities in public services provided to citizens and, ultimately, contributes to equality in benefit outcomes.

Source: Authors

ty" when viewed in an integrated manner. This is the answer to the last research question of this study: "What do changes in each TAPE concept produce in an integrated manner?" In other words, local governments' efforts to respond to changes in the concept of TAPE due to technological innovation will lead to the strengthening of "citizens' autonomy" and "service equality." These aspects have been identified as not having progressed as sufficiently by the decentralization reforms in Japan.

VI. Conclusion

This study has aimed to answer the following research questions: "How are the previous i) Transparency, ii) Accountability, iii) Participation, and iv) Equity concepts changing, or how will they change, resulting from these digitalization innovations in Japanese local governments?" "How are Japanese local governments responding, or how will they respond, to these changes?," and "What do changes in each TAPE concept produce in an integrated manner?" This study has sought to answer these questions based on the multiple case method for the pioneering initiatives of Kobe City and Chiba City.

The answers to each question have been provided in the previous section. However, there is further significance in this study. In the context of Japan, this article provides detailed descriptions of actual examples of how pioneering local government initiatives are overcoming various challenges amid technological innovation. In the Asian context, some aspects of the situation may not differ significantly from those in Japan. We believe that the initiatives described in this study can be applied to local governments in other Asian countries with certain modifications.

This study has several limitations. First, although systems have been established in both cases, they are still new, and some of the initiatives have not yet accumulated operational results; therefore, the study is insufficiently comprehensive. It should also be noted that it is insufficient to derive answers to the research questions posed in this study from the two pioneering cases alone. It is necessary to monitor the operation of the two cities' initiatives and to continue research and investigation to identify other pioneering initiatives.

However, we believe that the pioneering initiatives in Japan and the presentation of the changes in each TAPE concept now and in future, which are the themes of this collection of papers, as well as the integrated findings of these concepts, are significant for the EROPA countries.

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4 In this paper, (i)–(iv) will henceforth be referred to as "TAPE" when summarized.

5 https://www.soumu.go.jp/menu_seisaku/hakusyo/chihou/18data/18czb3-6.html

6 https://www.iap2.org/page/pillars

7 A city with a population of 500,000 or more, designated by a Cabinet Order pursuant to Article 252-19, Paragraph 1 of the Local Autonomy Law.

8 https://www.city.kobe.lg.jp/a47946/data.html

References

Abe, H. (2022). *Jichitai shokuin no tame no shimin sanka no susumekata* [How to promote citizen participation for municipal officials]. Gakuyō shobō.

Akiyoshi, T., Ito, S., & Kitayama, T. (2020). *Kōkyō seisaku-gaku no kiso* [Foundations of public policy studies] (3rd ed.). Yūhikaku.

Arnstein, S. R. (1969). A ladder of citizen participation. *Journal of the American of Planners*, *35*(4), 216-224.

Kawasaki, M. (2024). *Shin Chihō jichi-hō kihon kaisetsu* [New Commentary on the Local Autonomy Act]. Nippon hyōron-sha.

Matsuo, Y. (2023, June). Kōbe-shi no EBPM: Tōkei dēta o dasshubōdo nado de zenchō ni kyōyū [Kobe City's evidence-based policymaking: Sharing statistical data across departments via dashboards]. *Gekkan J-LIS* [Monthly J-LIS], 17-21.

Nakamura, A. (2007). *Jichitai shuken no shinario* [Scenario of local government sovereignty: Governance, NPM, and civil society] (Rev. ed.). Ashi shobō.

Odagiri, Y. (2014). Shimin kyōdō no hyōka: Kyōto-shi chōsa dēta ni motozuku bunseki [Evaluation of citizen collaboration: An analysis based on Kyoto City survey data]. *Dōshisha seisaku kagaku kenkyū* [Doshisha Journal of Policy Science], *15*(2), 59-76.

Odagiri, Y. (2017). Kyōdō: Kanmin kankei wa nani o umidasu no ka [Collaboration: What do public-private relationships produce?]. In Sakamoto H. (Ed.), *Shimin shakai-ron: Riron to jisshō no saizensen* [Civil society theory: Frontiers of theory and evidence] (pp. 143-157). Hōritsu bunka-sha.

Ohashi, H. (Ed.). (2020). *EBPM no keizaigaku: Ebidensu o jūshi shita seisaku ritsuan* [The economics of EBPM: Evidence-based policymaking]. University of Tokyo Press.

Okamoto, H. (2023). DX to chiiki no minshu shugi [Digital transformation and local democracy]. *Shisei kenkyū* [Journal of Municipal Research], *219*, 24-40.

Osumi, S. (1999). *Nyū paburikku manejimento: Rinen, bijon, senryaku* [New public management: Philosophy, vision, strategy]. Nippon hyōron-sha.

Soga, K. (2022). *Gyōsei-gaku* [Public administration] (New ed.). Yūhikaku.

Stewart, J. D. (1984). The role of information in public accountability. In A. G. Hopewood & C. Tomkins (Eds.), *Issues in public sector accounting* (pp. 13-34). Phillip Allan.

Uga, K. (2025). *Chihō jichi-hō gaisetsu* [Overview of the Local Autonomy Act] (11th ed.). Yuhikaku.

Yamatani, K. (1997). *Seisaku hyōka no riron to sono tenkai: Seifu no akaunṭabiriti* [Theory and development of policy evaluation: Government accountability]. Kōyo shobō.