Chapter 3

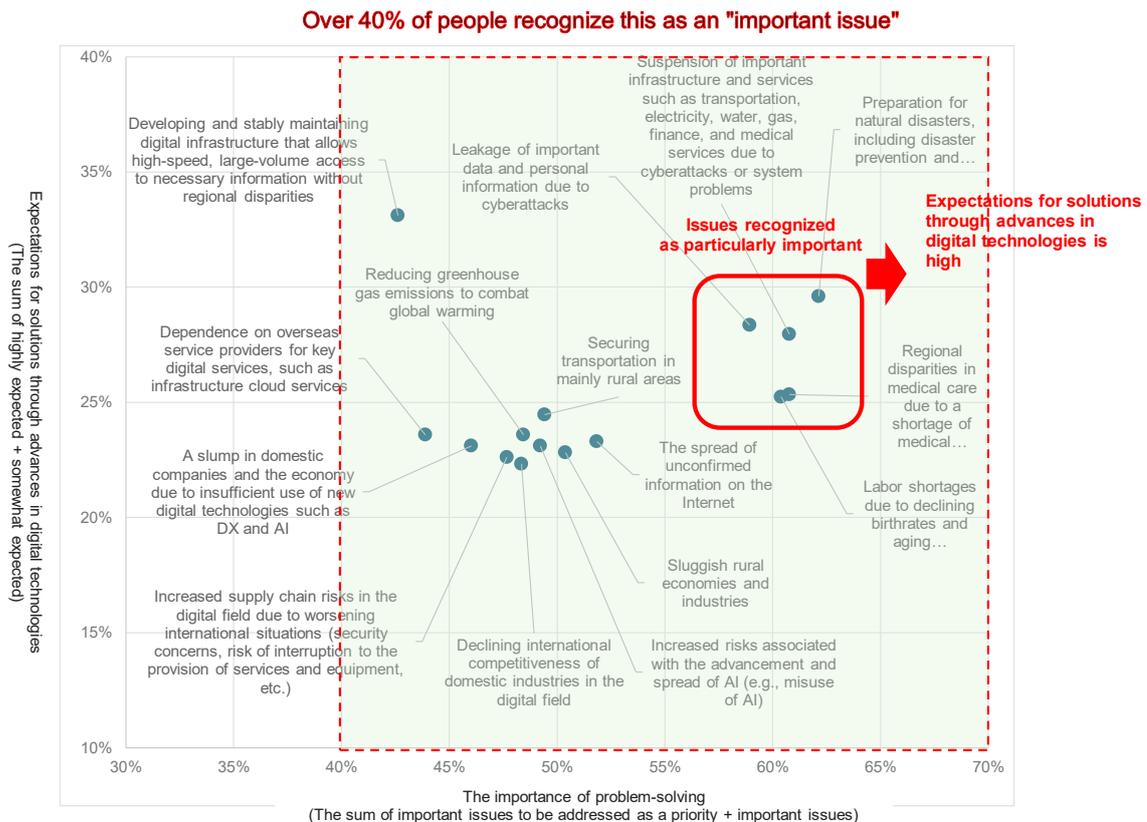## Toward Solving Social Issues through Advancing Digital Technologies

In Japan, the problem of a declining birthrate and aging population is becoming increasingly serious, and responding to the impoverishment and decline of local economies and the intensification of disasters has also become an important social issue. It is expected that further expanding the effective use of evolving digital technologies will contribute to solving and alleviating these social issues.

A survey was conducted on the importance of resolving major social issues and issues in the digital field, and the level of expectation that advances in digital technologies will lead to solutions to these social issues. For all issues, more than 40% of people responded that they recognized the presented issues as important issues (the sum of "important issues that should be addressed as a priority" and "important issues"). Among these, the ar-

eas where there were particularly high expectations for the advancement of digital technologies to solve problems included "preparation for natural disasters, including disaster prevention and mitigation," "regional disparities in medical care due to a shortage of medical professionals," "labor shortages due to a declining birthrate and aging population," as well as preventing cyberattacks, system failures, and related issues. Additionally, the highest percentage of respondents said they expect digital technologies to be used to develop and stably maintain a large-capacity, high-speed digital infrastructure without regional disparities **(Figure 1-3-1-1)**.

This chapter provides an overview of the role and prospects for digital technologies in resolving Japan's major social challenges.

Figure 1-3-1-1 Importance and the level of expectation for solving social issues and issues in the digital field

(Source) MIC (2025) "Survey on the latest trends in ICT, R&D, and digital utilization in Japan and other countries"

Section 1   Revitalizing and Growing Japan's Economy

In the future, as digital technologies such as AI and robots advance and become more widely used in society, it is expected that they will help revitalize the economy

by solving labor shortages, improving productivity and enhancing competitiveness in Japan, which is facing a declining birthrate and aging population, and population

decline. In addition, from the perspective of Japan's economic growth, and in light of the increasingly uncertain global situation, from the perspective of economic security, ensuring the autonomy of companies and organizations based in Japan by expanding the provision of services in the digital field is an important issue, therefore, it is important to promote efforts to strengthen the international competitiveness of Japan's digital companies.

1. Promoting the use of evolving digital technologies for business

One direction for efforts to link advancing digital technologies to economic growth is to utilize advancing digital technologies in areas where Japan or individual companies and organizations have strengths.

For example, the results of a survey conducted by the MIC show that Japan is lagging behind the U.S., China, and Germany in terms of utilizing digital technologies to transform business operations and formulating policies for using AI. Furthermore, compared with these foreign companies, the range of business fields in which generative AI is utilized is not as extensive[1]. It remains important for companies not only to achieve labor savings and efficiency by transforming entire business processes through DX, AI, robotics, etc. and utilizing them in a variety of operations, but also to work on innovations that bring new added value through digital technologies while leveraging their strengths[2].

2. Efforts to strengthen competitiveness in the digital field

Promoting efforts to strengthen competitiveness in the digital field is also an important challenge. In the digital field, technological innovation has often brought about major game-changing reforms, dramatically altering mainstream services and providers. It has been pointed out that accurately capturing this game-changing wave will be a major key to business development in the digital field. Considering that ensuring Japan's autonomy in key services and infrastructure in the digital field is an important issue, [3]it is desirable to approach the issue in a way that makes use of Japan's strengths and ensure Japan's international competitiveness in key areas of the next digital infrastructure and services.

For example, AI is a field where major technological innovations are often occurring. While there is a technological background in the form of "Scaling Law" that favors those who can make large-scale investments, the development of small-scale LLMs, which have relatively limited training data and computational volume, is pointed out as an area in which Japanese companies and organizations can demonstrate their strengths, as it requires model diversity, such as customization for individual companies. [4]It is also anticipated that small-scale models will have an advantage in dealing with power constraints and handling highly confidential information. Furthermore, there is potential for new players to bring about technological innovation, and it is a field with a wide range of potential applications. Considering the potential for game-changing technological innovation, it is important to continue developing domestic LLMs, while promoting business development and social implementation of AI, and to capture the game-changing wave that comes with technological innovation[5]. Various Japanese companies are already working on developing such LLMs, and the government's policies are also supporting this[6].

Robots, combined with advances in AI, are also a field that could see a game-changing impact, and various re-

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[1] Refer to "Trends in digital usage" in Section 11, Chapter 1, Part II for international comparison of digital usage in companies Refer to "Current status of AI usage in companies" in Section 2 (2), Chapter 1, Part I for the status of formulating AI usage policies in companies and AI usage for business operations

[2] As a specific example, in the content field, digital technologies make it easy to deliver content around the world, transcending national and language barriers; the global content market has grown rapidly since recovering from the COVID-19 pandemic; and there is a growing labor shortage in the content industry, making digitalization increasingly important in content production. In light of this situation, in October 2024, the Japan Business Federation published a proposal for promoting Japan's content field ("Entertainment Contents ∞ 2024"). Here, in particular, promoting digital transformation in content production, developing and utilizing generative AI, and supporting the creation, challenges, and growth of Japanese content platformers will be discussed as digital-related efforts.

[3] From the perspective of business development that leverages the trust in Japan as a strength, given today's unstable global situation and geopolitical risks, there is a growing need for data storage, business infrastructure development, and collaboration in countries and regions that are as trustworthy as one's own, and it has been pointed out that Japan is in a fairly good position in this regard (based on an interview with Professor Kokuryo Jiro of the Faculty of Policy Management, Keio University). In addition, it has been pointed out that the stability of Japan's politics and administration is highly regarded worldwide, making it an attractive investment destination, and that increasing the predictability of business could also help Japan to demonstrate its presence (based on an interview with Professor Suzuki Kazuto of the Graduate School of Public Policy, The University of Tokyo). One of the possibilities Japan could aim for is to take advantage of Japan's such trust and stability to attract investment and collaboration from foreign business operators.

[4] Based on an interview with Okanohara Daisuke, CEO of Preferred Networks, and Kinoshita Masafumi, Executive Officer of ABEJA, Inc.).

[5] In the field of AI, which requires large-scale investments and advanced technologies, it may be difficult in the short term for Japan to immediately develop a model comparable to the cutting-edge LLMs led by foreign business operators. However, with various technological innovations likely to occur, from a medium- to long-term perspective, it has been pointed out that Japan needs to simultaneously work on developing and using general-purpose domestic LLMs (or next-generation AI resulting from future technological innovations) in light of the need for Japan's economic security and the protection of important data, as well as ensuring transparency of training data and training methods, cultural perspectives, and the improvement of Japan's AI technological capabilities (based on an interview with Okanohara Daisuke, CEO of Preferred Networks). Furthermore, in addition to the need to use domestically produced general-purpose LLMs in situations where important data protection is required, it is expected that countries that find it difficult to develop AI domestically will choose to introduce inexpensive foreign-made AI, while keeping security risks in mind. It has also been pointed out that Japan should also improve its technological capabilities in developing general-purpose LLMs that can be reused in other countries, and use the high level of quality and security as a competitive edge to deploy AI models overseas (based on an interview with Professor Suzuki Kazuto of the Graduate School of Public Policy, The University of Tokyo).

[6] Refer to "LLM research and development trends" in Section 2, 1 (3) (i), Chapter 1, Part I

search and development activities and efforts for social implementation are underway in Japan[7].

Moreover, an example of an initiative being undertaken in the field of next-generation communications is the IOWN concept proposed by NTT. Various initiatives are steadily progressing, including the formation of a global ecosystem, such as the formation and expansion of the IOWN Global Forum and the start of training engineers overseas.

Government efforts to strengthen competitiveness in the digital field are being undertaken at various levels by relevant ministries and agencies. For example, the MIC established a permanent fund at NICT in March 2023 and newly launched the Innovative ICT Fund Projects for Beyond 5G/6G, within which it has established three programs, including the "Strategic Program for Social Implementation and Global Deployment," which will carry out research and development projects aimed at social implementation and overseas deployment.

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[7] Refer to "Trends in AI robotics research and development and social implementation" in Section 2, 1 (3) (i), Chapter 1, Part I

Section 2   Regional Revitalization

The issue of a declining birthrate and aging population is even more serious in rural areas. Measures are urgently required to address issues such as the exhaustion of rural economies and the maintenance of rural social infrastructure. It is important to fully leverage digital technologies and new technologies for promoting initiatives to maintain and improve the living environment in rural areas and revitalize rural economies. In this context, the "Basic Plan for Regional Revitalization 2.0," approved by the Cabinet in June 2025, sets out the thorough utilization and social implementation of new technologies such as AI and digital technologies as one of the basic approach and perspectives of Regional Revitalization 2.0, with the aim of creating sustainable local communities where local residents can enjoy a safe and comfortable living environment, as well as leading to sustainable growth and strengthening of the competitiveness of the local economy.

The MIC is implementing Regional Community DX Promotion Package Project in order to realize Regional Revitalization 2.0 using ICT technologies. This project aims to create good examples of digital implementation through comprehensive measures such as supporting the securing of digital human resources and systems, demonstrating advanced solutions such as AI and autonomous driving, and advanced wireless systems, and subsidizing the development of regional communications infrastructure, as well as to quickly put digital technologies into practical use nationwide by disseminating the necessary information effectively and efficiently.

1. Improving the living environment in rural areas

Labor shortages caused by a declining birthrate and aging population are having a negative impact on the living environment in rural areas. In order to maintain and ensure an environment in which people can live safely in rural areas, it is necessary to ensure stable maintenance and management of infrastructure and to ensure that public and quasi-public services are accessible when needed.

(1) Infrastructure maintenance and management

In Japan, the problems of aging infrastructure and a decline in the workforce are becoming more serious. To address this issue, there is a growing need to improve the sophistication and efficiency of infrastructure maintenance and management through technologies such as AI.

For example, regional railways face challenges in ensuring business continuity due to declining ridership and a shrinking pool of job applicants, which weakens their operational capacity. At the same time, the growing risks of accidents caused by intensifying natural disasters and aging infrastructure raise further concerns, making it increasingly difficult to rely on traditional visual inspection methods for future operation and maintenance. In response to this, a demonstration project is being carried out as part of the MIC's' FY2024 Regional Digital Infrastructure Utilization Promotion Project (demonstration project) to build a system in which high-resolution video data from a train's front-facing camera (on-board device) is transmitted to an AI server and analyzed for abnormalities in track facilities, etc., replacing patrol work that normally takes several hours with AI, and by checking only the necessary areas on-site, reducing the workload and shortening the time required. To build a general-purpose AI model, joint verification is being carried out with 30 railway companies nationwide in collaboration with urban railways, and solutions for regional railways are being developed **(Figure 1-3-2-1)**.

Figure 1-3-2-1   Overview of the "joint creation of railway digital innovation project utilizing Wi-Fi 6E, AI, etc. for regional railway operators"
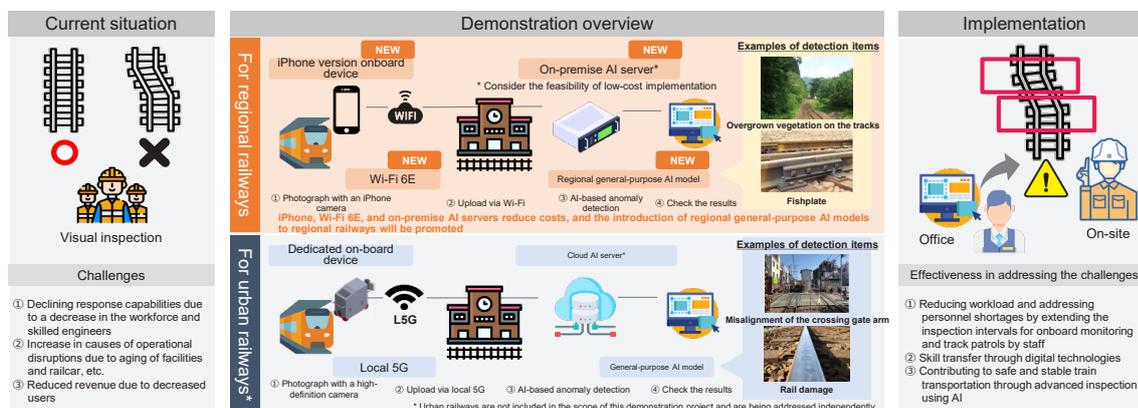
(Source) MIC (2025) "Report on the result of the joint creation of railway digital innovation project utilizing Wi-Fi 6E, AI, etc. for regional railway operators"

(2) Public and quasi-public services

The declining population due to a declining birthrate and aging population is threatening the maintenance of public local infrastructure such as administrative services and medical care, as well as residents' access to those services. For this reason, there is a need to provide sustainable services that utilize digital technologies and are tailored to the lifestyles of residents.

For example, the MIC has been conducting demonstration projects in which post offices and local public infrastructure such as local governments work together to solve various regional issues, and has been implementing the "Project for Promotion of Public Regional Infrastructure Cooperation of Post Offices, etc." since FY2022, with the aim of promoting model cases nationwide. One of the demonstration themes for this project in FY2024, "Providing Services Essential to Local Communities, with Post Offices as 'Community Hubs'" was carried out in Akiota Town, Hiroshima Prefecture. Post offices will act as "community hubs" that provide a variety of services in a centralized manner, offering services such as online medical consultations, medication guidance, and counter services for local government organizations (Figure 1-3-2-2).

Figure 1-3-2-2 Providing Services Essential to Local Communities, with Post Offices as "Community Hubs"
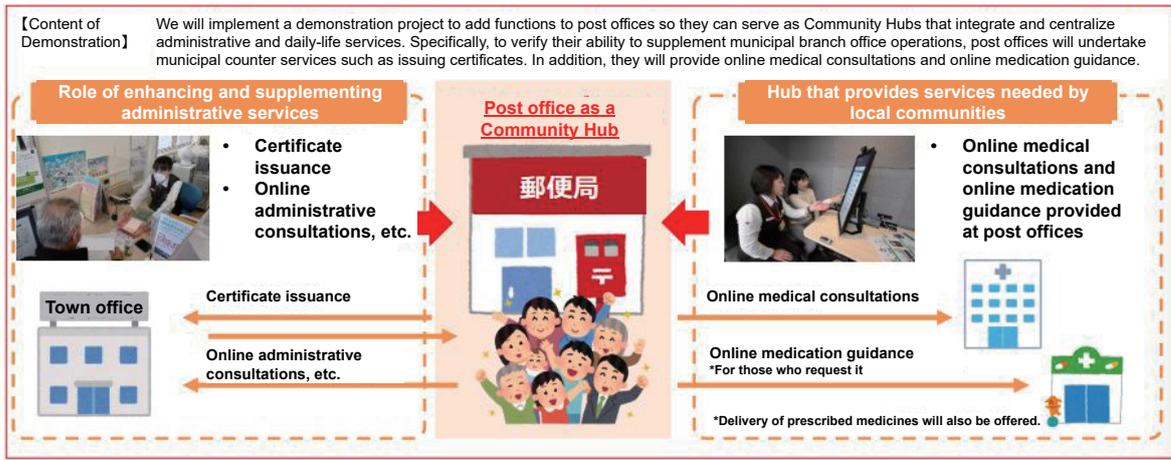
(Source) MIC material[1]

(3) Digital infrastructure

In order to use advancing digital technologies, communications infrastructure that can stably carry out large-capacity, ultra-high-speed communications is necessary even in rural areas. In the future, traffic volume is expected to increase dramatically due to the growing need for real-time exchange of large volumes of high-definition video and image data for the use of AI and other technologies, and the need for advanced communication infrastructure such as 5G and optical fiber to support this is thought to be greater than ever before.

For example, in its "Advanced Wireless Environment Development Promotion Project," the MIC subsidizes part of the costs when local governments, telecommunications carriers, etc. develop optical fiber, etc., which is a prerequisite for high-speed, large-capacity wireless communication, in disadvantaged areas, with the aim of realizing advanced wireless environments such as 5G and IoT, and when local governments maintain and manage optical fiber, etc., in remote island areas[2].

2. Revitalizing rural economies

In regions facing serious labor shortages, improving productivity through the use of digital technologies is an urgent priority, and efforts are underway across various sectors. In addition, for the development of regional economies, it is essential to create high-value-added services by utilizing digital technologies in industries that leverage the characteristics and appeal of each region. In this regard, approaches can be considered from a variety of fields, such as creating and branding local specialties in the agriculture, forestry and fisheries indus-tries, and improving the brand value of traditional crafts.

For example, smart agriculture measures are being taken in the agricultural field, which is facing a shortage of successors. Obihiro City in Hokkaido utilized a demonstration project under the MIC's "FY2024 Regional Digital Infrastructure Utilization Promotion Project," along with grants for the Vision for a Digital Garden City Nation, to develop and test a communication environment and agricultural machinery tailored to the region. Through this project, Obihiro City built cooperative rela-

[1] MIC "Implementation of the Demonstration Project for 'Providing Services Essential to Local Communities, with Post Offices as Community Hubs' as part of the 'Project for Promoting Collaboration between Post Offices and Regional Public Infrastructures' for FY 2024" <https://www.soumu.go.jp/menu_news/s-news/01ryutsu13_02000134.html> (Reference March 24, 2025)
[2] MIC "Broadband Infrastructure Development" <https://www.soumu.go.jp/main_sosiki/joho_tsusin/broadband/index.html> (Reference March 25, 2025)

tionships with private companies and universities, and is promoting labor-saving and efficiency improvements using new digital technologies, such as crop management that combines drones and AI, and demonstration of simultaneous operation of multiple unmanned tractors[3].

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[3] MIC "Simultaneous control of four tractors! Smart agriculture evolving in Obihiro" <https://dx-navi.soumu.go.jp/index.php/support_r6/digital_kiban/article/005> (Reference Marc 27, 2025)

Section 3　Responding to Increasingly Severe Disasters

In recent years, as disasters become more severe and frequent in Japan, which makes it important to take more advanced disaster prevention measures than ever before, disaster prevention and reduction through the use of digital technologies are expected to have great effects. In addition, although telecommunications and broadcasting networks have been made more resilient in response to frequent disasters, such as earthquakes, it is still required to make digital infrastructure more resilient.

For example, in order to utilize digital technologies for disaster prevention and reduction, a robust digital infrastructure is necessary. Of these, broadcasting networks play a major role as a method of transmitting information during disasters, but in the earthquake that occurred in the Noto region of Ishikawa Prefecture in January 2024, terrestrial television broadcasting, radio broadcasting, and cable television were all disrupted due to power outages, damage to relay station equipment, and cable breaks. Learning from this experience,

the MIC reinforced its support projects for strengthening broadcasting networks. In addition, cooperation among broadcasting companies is also being promoted in order to respond to disasters.

Furthermore, to support the strengthening of communication networks, the MIC plans to launch a "Project to strengthen mobile phone base stations in the event of disasters" in FY2025. Moreover, to strengthen the resilience of communication networks and recovery systems, telecommunications carriers are expanding their measures by developing mobile base stations and utilizing [1]unmanned aerial vehicles and low-orbit satellites.

In addition, with regard to data centers and submarine cables, which are important digital infrastructures that support a digital society, promoting regional decentralization has become an important issue from the perspective of disaster prevention, and efforts are being made to address this[2].

There is a continuing need to build digital infrastructure that is resilient to disasters.

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[1] Refer to "Utilization of NTN" in Section 1, 2 (1), Chapter 2, Part I for the utilization of NTN
[2] Refer to "Decentralization of data centers and submarine cables" in Section 1, 2 (1) (i), Chapter 2, Part I for the decentralization of data centers and submarine cables