1. Economic size of the ICT industry

(1) Domestic production value

- ICT industry’s production value was 108.4 trillion yen, making it the largest industry in the country (Figure 4-1-1-1). It had reached 120.4 trillion yen in 2000, however, its production value cooled off for several years in response to the collapse of the IT bubble. The industry started growing again in 2005 and reached 117.3 trillion yen in 2007, but its production value plummeted to 101.1 trillion yen in 2009 due to the 2008-2009 global financial crisis. Even after 2010 it continued to slide, dropping to 92.8 trillion yen in 2012. However, since 2013 signs of recovery finally started to appear to be 108.4 trillion yen in 2019 (Figure 4-1-1-2).

![Figure 4-1-1-1 Domestic production values of major industries (based on nominal and real) (breakdown) (2019)](source)

![Figure 4-1-1-2 Changes in domestic production values of major industries (based on nominal and real)](source)
In 2019, the ICT industry's real domestic production value, based on constant 2015 values, was 108.5 trillion yen and accounted for 10.7% of all industries. In contrast to the nominal values, it has increased since 2000 and reached 105.3 trillion yen in 2007. It decreased to 93.5 trillion yen in 2012, but signs of recovery could be seen from 2013 (Figure 4-1-2).

(2) Gross Domestic Product (GDP)
- The nominal GDP of the ICT industry in 2019 was 51.7 trillion yen and accounted for 9.4 percent of all industries.

The nominal GDP of the ICT industry fell in 2019 by 0.1 percent year-on-year to 51.7 trillion yen. Looking at the size of nominal GDP of the main industries shows that the ICT industry's nominal GDP accounts for 9.4 percent of the combined nominal GDPs of all industries and is the third largest after the commerce and real estate industries. Real GDP according to constant 2015 values accounted for 9.9% of the real GDP of all industries (Figure 4-1-1-3).

Looking at the growth rate in 2018-2019, ICT industry rose by 0.9% year-on-year, and is the fourth highest after medical, health and welfare (2.4%), business services (1.4%) and personal services (1.1%) industries (Figure 4-1-1-4).

Similar to the nominal domestic production value, the nominal GDP of the ICT-related manufacturing and ICT-related construction industries has been decreasing. On the other hand, the Internet-related services industry has grown rapidly.

(3) Employment
- ICT industry employment totaled 4.058 million in 2019 and accounted for 5.6 percent of total employment in all industries, which is a 16.5% decrease from 2000.

The ICT industry employed 4.058 million people in 2019 (±0.0 percent from the previous year), and accounted for 5.6 percent of total employment in all industries. Compared with 2018, Internet-related services (up by 6.7 percent from the previous year), ICT-related services (up by 2.5 percent from the previous year) and research (up by 0.6 percent from the previous year) were steadily growing. However, video, audio and text information production (down by 4.6 percent from the previous year) was declining.

--

Figure 4-1-1-3 GDP of major industries (based on nominal and real)

Figure 4-1-1-4 Changes in GDP of major industries (based on nominal and real)
ous year), communications (down by 1.5 percent from the previous year) and ICT-related manufacturing (down by 1.4 percent from the previous year) decreased (Figure 4-1-5).

\[\text{Figure 4-1-5 Changes in employment in the ICT industry}\]

\[\text{Table 4-1-1-5 Employment changes in the ICT industry}\]

\[\begin{array}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline
\hline
\text{ICT-related services} & & & & & & & & & & & & & & & & & & \\
\text{ICT-related construction} & & & & & & & & & & & & & & & & & & \\
\hline
\end{array}\]

\[\text{(Source) MIC (2021) “Study on Economic Analysis of ICT”}\]

2. ICT industry contributions to the national economy

(1) ICT industry’s economic spillover effects

- The scale of economic spillover effects caused by the ICT industry is one of the largest in all industries in terms of induced added value

When different industries make intermediate inputs to the production activities of the ICT industry, this generates added value (e.g. operating surplus and employee compensation) and employment in those industries. The economic spillover effects\(^1\) of the ICT industry were estimated to be 92.1 trillion yen in induced added value, and 8.514 million in induced employment. ICT industry shows the largest economic spillover effect in terms of induced added value, and also shows higher inducement in jobs than the transportation equipment industry (2.490 million jobs), which is recognized as one of broad industries (Figure 4-1-2-1).

\[\text{Figure 4-1-2-1 Changes in economic spillover effects (induced added value and induced employment) from major industries’ production activities}\]

\[\text{Table 4-1-2-1 Economic spillover effects from major industries’ production activities}\]

\[\begin{array}{|c|c|c|c|c|c|c|c|c|c|c|}
\hline
\text{Year} & 2005 & 2011 & 2015 & 2018 & 2019 \\
\hline
\text{ICT industry} & 83.1 & 81.8 & 89.3 & 92.2 & 92.1 \\
\text{Commerce} & 83.1 & 81.8 & 89.3 & 92.2 & 92.1 \\
\text{Real estate} & 83.1 & 81.8 & 89.3 & 92.2 & 92.1 \\
\text{Construction} & 83.1 & 81.8 & 89.3 & 92.2 & 92.1 \\
\text{Business service} & 83.1 & 81.8 & 89.3 & 92.2 & 92.1 \\
\text{Transportation equipment} & 83.1 & 81.8 & 89.3 & 92.2 & 92.1 \\
\text{Medical, health care and welfare} & 83.1 & 81.8 & 89.3 & 92.2 & 92.1 \\
\text{Personal service} & 83.1 & 81.8 & 89.3 & 92.2 & 92.1 \\
\hline
\end{array}\]

\[\text{(Source) MIC (2021) “Study on Economic Analysis of ICT”}\]

\[\text{1 There are two methods of calculating economic spillover effects: (1) calculating the economic spillover effects for all Japan’s industries brought about by each industry sector’s final demand, focusing on the goods and services that constitute the industry sector’s final demand and (2) calculating the economic spillover effects for all Japan’s industries brought about by each industry sector’s production activities (total of final demand and intermediate demand), focusing on the industry sector itself. The latter method was used here.}\]
3. Exports and imports in the ICT field

(1) Technology balance of payments

• The ICT industry posted a surplus in technology exports1 in FY 2019

The receipts from Japan’s technology exports in FY 2019 totaled 3.6626 trillion yen, to which the ICT industry contributed 497.1 billion yen, or 13.6 percent. On the other hand, the payments from technology imports was 543.6 billion yen, of which 232.4 billion yen came out of the ICT industry, or 42.7 percent. While the balance of payments, together with the ICT industry, posted export surplus, in the breakdown, the information and communications posted import surplus. Manufacture of information and communication electronics equipment sector accounted for the largest share of the ICT industry’s technology exports, while information and communications sector accounted for the largest share of imports (Figure 4-1-3-1).

![Figure 4-1-3-1 Technology exports and imports by industry (FY 2019)](image)

(2) Number of researchers

• The ICT industry employed 174,277 researchers, or 34.3 percent of all enterprise researchers in Japan

There were 880,954 researchers in Japan as of March 31, 2020 (the total of all researchers at enterprises, nonprofit organizations, public agencies, universities, etc.). 174,277 people (34.3 percent of all enterprise researchers) out of 507,473 enterprise researchers (about 58 percent of all researchers) are in the ICT industry. The manufacture of information and communication electronics equipment sector had the most researchers in ICT industry sector (Figure 4-1-4-1).

4. Research and development in the ICT field

(1) Research and development spending

• The ICT industry2 spent 3.8571 trillion yen on research in FY 2019, accounting for 27.1 percent of all enterprise research expenditure

According to the “Survey of Research and Development”, Japan’s total scientific and technological research expenditure (i.e., research spending) in FY 2019 stood at 19.5757 trillion yen (the combined research spending by enterprises, nonprofit organizations, public agencies, universities, etc.). Enterprise research expenditure, which accounts for about 70 percent of all research expenditure, was 14.2121 trillion yen. Of this amount, 3.8571 trillion yen (27.1 percent) was spent on research by the ICT industry. Manufacture of electrical machinery, equipment and supplies sector was the largest research spender in the ICT industry (Figure 4-1-4-1).

(2) Number of researchers

• The ICT industry employed 174,277 researchers, or 34.3 percent of all enterprise researchers in Japan

There were 880,954 researchers in Japan as of March 31, 2020 (the total of all researchers at enterprises, nonprofit organizations, public agencies, universities, etc.). 174,277 people (34.3 percent of all enterprise researchers) out of 507,473 enterprise researchers (about 58 percent of all researchers) are in the ICT industry. The manufacture of information and communication electronics equipment sector had the most researchers in ICT industry sector (Figure 4-1-4-2).

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1 The value of technology trade is the equivalent value received from the provision (export) of patents, knowledge, technical direction, and other forms of technology transfers to other countries or the equivalent value paid the reception (import) of the same forms of technology transfers from other countries.

2 ICT industry here refers to the manufacture of information and communication electronics equipment segment, the manufacture of electrical machinery, equipment and supplies segment, the electronic parts devices, and electronic circuits segment, and the information and communications segment (including information services, communications, broadcasting, Internet-related services, and other ICT sectors).
5. State of ICT enterprise operations

The Basic Survey on the Information and Communications Industry is a general statistical survey (started in 2010) that MIC and the Ministry of Economy, Trade and Industry jointly conduct under the Statistics Act (Law No. 53 of 2007) to clarify the operations of enterprises belonging to the ICT industry — a Large Category G in the Japan Standard Industry Classification — and to obtain basic data for ICT industry policies. The following sections provide an overview of the 2020 survey that pertains to enterprises operations.

(1) Summary of enterprises engaging in ICT business operations
(activity-base results)

a. General summary of the survey results

• 5,714 enterprises were engaged in ICT business operations with sales in excess of 50 trillion yen

Sales attributed to ICT business operations in FY 2019 totaled 51,645 trillion yen (total sales by all enterprises were 70,338 trillion yen). By sector, the telecommunications sector accounted for 34.0 percent of all sales (down by 0.6 percentage points from the previous year), the computer programming and other software services sector 31.6 percent (up by 1.2 percentage points from the previous year) (Figure 4-1-5-1).

The number of enterprises engaging in ICT business operations (irrespective of whether ICT business operations are the enterprise’s mainstay operations) stood at 5,714. Operating profits were 6.3194 trillion yen, ordinary income was 7.0269 trillion yen, and the enterprises held 10,118 subsidiaries and associated companies.

b. Breakdown of sales

• Enterprises capitalized at least 100 million yen accounted for more than 60 percent of all enterprises in 8 out of 12 ICT industry sectors

A breakdown of ICT industry enterprises by capital size reveals that enterprises capitalized at less than 100 million yen accounted for more than 60 percent of all enterprises in 8 out of 12 ICT industry sectors. Of particular note are the sectors in video picture information production and distribution, sound information production, commercial art and graphic design where enterprises capitalized at less than 50 million yen accounted...
for more than 40 percent of all enterprises in each respective sector (Figure 4-1-5-2).

Figure 4-1-5-1  ICT industry sales

(Unit: trillion yen)

<table>
<thead>
<tr>
<th>Service</th>
<th>Sales (Trillion Yen)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telecommunications</td>
<td>51.6459</td>
<td>31.6%</td>
</tr>
<tr>
<td>Computer programming and other software services</td>
<td>2.940</td>
<td>1.8%</td>
</tr>
<tr>
<td>Data processing and information services</td>
<td>1.923</td>
<td>1.2%</td>
</tr>
<tr>
<td>Sales in the ICT industries</td>
<td>51.6459</td>
<td>31.6%</td>
</tr>
<tr>
<td>Private-sector broadcasting</td>
<td>2.1662</td>
<td>1.3%</td>
</tr>
<tr>
<td>Services incidental to internet</td>
<td>4.1296</td>
<td>2.5%</td>
</tr>
<tr>
<td>Services incidental to video information, sound information, character information production and distribution</td>
<td>17.5520</td>
<td>34.0%</td>
</tr>
<tr>
<td>Miscellaneous ICT businesses</td>
<td>0.2054</td>
<td>0.4%</td>
</tr>
<tr>
<td>Newspaper publishers</td>
<td>0.1218</td>
<td>0.2%</td>
</tr>
<tr>
<td>Commercial art and graphic design</td>
<td>0.2295</td>
<td>0.4%</td>
</tr>
<tr>
<td>Publishers, except newspapers</td>
<td>0.8756</td>
<td>1.7%</td>
</tr>
<tr>
<td>Video picture information production and distribution</td>
<td>0.8913</td>
<td>1.7%</td>
</tr>
<tr>
<td>Newspapers</td>
<td>1.2726</td>
<td>2.5%</td>
</tr>
<tr>
<td>Cablecasting</td>
<td>0.5140</td>
<td>1.0%</td>
</tr>
</tbody>
</table>

(Notes)
* 1 Figures in parentheses are the number of companies.
* 2 “Miscellaneous ICT businesses” refers to enterprises that selected “other” as the primary business in the breakdown for sales attributable to ICT business operations.

(Source) MIC / METI “2020 Basic Survey on the Information and Communications Industry”

Figure 4-1-5-2  Breakdown of ICT industry enterprises by capital size

(Source) MIC / METI “2020 Basic Survey on the Information and Communications Industry”
6. Telecommunication market trends

(1) Market size
- Sales is increasing in the telecommunications sector, while, by service category, the data transmission services accounted for approximately 50 percent of share.

Sales in the telecommunications sector in FY 2019 (Figure 4-1-6-1) were 14.8726 trillion yen (an increase of 7.0 percent from the previous year). Fixed line communications accounted for 28.5 percent, and mobile communications for 49.9 percent, of all sales in FY 2019 (Figure 4-1-6-2). Looking at sales by service category shows that voice transmission services accounted for 29.2 percent and data transmission services for 49.3 percent (Figure 4-1-6-3).
7. Broadcasting market trends

(1) Size of the broadcasting market

a. Broadcaster sales

• Broadcaster sales totaled 3.8643 trillion yen in FY 2019

Japanese broadcasters are divided into two categories: Japan Broadcasting Corp., a public broadcaster known as NHK, which depends on receiving fee revenues, and private broadcasters that depend on advertisements or paid programming. Aside from these two categories, the Open University of Japan also provides broadcasting services for educational purposes.

Sales for the entire broadcasting sector, including revenues from broadcasting and non-broadcasting operations, decreased from FY 2018 to 3.8643 trillion yen (down by 2.0 percent from the previous year) in FY 2019.

By category, terrestrial-based private broadcasters’ sales were 2.2640 trillion yen (down by 3.2 percent from the previous year), satellite-based private broadcasters’ sales were 362.3 billion yen (up by 0.1 percent from the previous year), and cable TV broadcasters’ sales were 500.8 billion yen (down by 0.4 percent from the previous year). NHK’s ordinary operating income was 737.2 billion yen (±0 percent from the previous year).

In terms of market share, terrestrial-based private broadcasters accounted for 72.4 percent (down by 0.6 percentage points) of private broadcasters’ sales (Figure 4-1-7-1).

8. Content market trends

(1) Size of Japan’s content market

• The Japanese content market was valued at 11.9552 trillion yen, nearly 60 percent of which was attributable to video content, about 35 percent to text-based content, and about 7 percent to audio-based content.

The Japanese content market was valued at 11.9552 trillion yen in 2019. By content segment, video content accounted for nearly 60 percent of the market, text-based content, 35 percent, and audio-based content, 7 percent (Figure 4-1-8-1).

The overall size of the content market has gradually
been increasing. The size of each content segment shows that, though the video content segment expanded while the text-based content segment contracted recently, from 2018 to 2019, all sectors stayed flat (Figure 4-1-8-2).

(2) Trends in the online content market

- The market for online content, which is consumed via the Internet on computers and mobile phones, was 4.2868 trillion yen, accounting for 35.9 percent of the entire content market.

Within the overall content market, the market for online content, which is consumed via the Internet on computers and mobile phones, reached 4.2868 trillion yen. By content segment, the video content segment accounted for 61.8 percent of the online content market, the text-based content segment accounted for 28.5 percent, and the audio-based content segment had 9.7 percent (Figure 4-1-8-3).

The online content market has been growing steadily. The market size by content segment shows that the video content segment has been increasing because of the increase in the movies and original internet contents, which drives the expansion of the online content market (Figure 4-1-8-4).

(3) Trends in the broadcast content market

- The export value of Japanese broadcast content was 52.95 billion yen in FY 2019.

The export value of Japanese broadcast content in FY 2019 was 52.95 billion yen (Figure 4-1-8-5). Looking at the composition of the export value of Japanese broadcast content, the total of program broadcast rights, Internet distribution rights, and commercialization rights account for more than 90 percent. Especially, export value of commercialization rights have shown significant growth. The export value of program broadcasting rights includes cases in which program broadcasting rights and Internet distribution rights are sold as a set, so Internet distribution has a high impact on the overall exports (Figure 4-1-8-6).
Figure 4-1-8-3 Breakdown of the online content market (2019)

(Unit: billion yen)

- Video-based content: 2.6496 trillion yen (61.8%)
- Audio-based content segment: 0.4162 trillion yen (9.7%)
- Text-based content segment: 1.2209 trillion yen (28.5%)
- Game software: 1.3497 trillion yen (31.5%)
- Original Internet videos: 0.4858 trillion yen (11.3%)
- Movies: 0.3535 trillion yen (8.2%)
- Videos: 0.2482 trillion yen (5.8%)
- Terrestrial TV programs: 0.1452 trillion yen (3.4%)
- Satellite and cable TV broadcast programs: 0.0671 trillion yen (1.6%)
- Music: 0.4008 trillion yen (9.3%)
- Other audio-based content: 0.0155 trillion yen (0.4%)
- Original Internet content: 0.4243 trillion yen (9.7%)
- Books: 0.2656 trillion yen (6.2%)
- Other text-based content: 0.155 trillion yen (0.4%)
- Newspapers: 0.1606 trillion yen (3.7%)
- Comics: 0.1879 trillion yen (4.4%)
- Table: Changes in the online content market size (by content segment)

(Source) Institute for Information and Communications Policy, MIC "Survey on the Production and Distribution of Media Content"

Figure 4-1-8-4 Changes in the online content market size (by content segment)

(Source) Institute for Information and Communications Policy, MIC "Survey on the Production and Distribution of Media Content"

Figure 4-1-8-5 Changes in Export value of Japanese broadcast content

(billion yen)

- 2014: 18.25
- 2015: 28.65
- 2016: 39.35
- 2017: 44.45
- 2018: 51.94
- 2019: 52.95

(Notes)
* 1 Export value of broadcast content: program broadcasting rights, Internet distribution rights, video/DVD production rights, program formatting and remaking rights, commercialization rights, and similar rights.
* 2 Calculated based on questionnaire responses from NHK, main commercial broadcast stations, producers, sub-main commercial broadcast stations in Osaka, local stations and satellite broadcasting stations.
* 3 Calculations for FY 2016 and later include digital gaming rights.
(Source) Prepared from MIC "Survey on the State of Overseas Expansion of Broadcast Content"
1. Internet usage trends

(1) ICT device ownership

- Ownership rate of smartphones for households is 86.8 percent

The ownership rate for ICT devices (households) in 2020 was 86.8 percent for “smartphones”, which is included in “mobile devices” (96.8 percent) and the rate of “personal computers” is 70.1 percent. The rate for “fixed-line telephones” was 68.1 percent (Figure 4-2-1-1).

(2) Internet usage

a. Internet usage rate (individuals)

- Usage of the Internet by individuals was nearly 80 percent

The Internet usage rate (individuals) in 2020 was 83.4 percent (Figure 4-2-1-2). Looking at the Internet usage rate by devices, “smartphones” (68.3 percent) exceeded “personal computers” (50.4 percent) by 17.9 points (Figure 4-2-1-3).

Section 2 ICT Service Usage Trends

Figure 4-1-8-6 Changes of the Export value of Japanese broadcast content by broadcast rights

Table 4-1-8-6-1 Changes in ownership rates for ICT devices (households)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed-line telephones</td>
<td>85.8</td>
<td>83.6</td>
<td>79.9</td>
<td>79.1</td>
<td>75.7</td>
<td>75.4</td>
<td>72.2</td>
<td>70.6</td>
<td>64.5</td>
<td>69.0</td>
</tr>
<tr>
<td>Mobile devices (overall)</td>
<td>93.2</td>
<td>94.9</td>
<td>94.5</td>
<td>94.8</td>
<td>94.6</td>
<td>93.8</td>
<td>94.7</td>
<td>94.8</td>
<td>96.7</td>
<td>96.1</td>
</tr>
<tr>
<td>Smartphones</td>
<td>9.7</td>
<td>9.3</td>
<td>4.8</td>
<td>4.2</td>
<td>3.8</td>
<td>3.5</td>
<td>0.0</td>
<td>0.0</td>
<td>2.5</td>
<td>3.0</td>
</tr>
<tr>
<td>Personal computers</td>
<td>83.4</td>
<td>77.4</td>
<td>75.8</td>
<td>74.7</td>
<td>76.8</td>
<td>76.8</td>
<td>72.5</td>
<td>74.0</td>
<td>69.1</td>
<td>70.1</td>
</tr>
<tr>
<td>Tablets</td>
<td>7.2</td>
<td>8.6</td>
<td>15.3</td>
<td>21.9</td>
<td>26.3</td>
<td>33.3</td>
<td>34.4</td>
<td>36.4</td>
<td>40.1</td>
<td>37.4</td>
</tr>
<tr>
<td>Wireless devices</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Internet-enabled home game consoles</td>
<td>23.3</td>
<td>24.5</td>
<td>29.5</td>
<td>38.3</td>
<td>33.0</td>
<td>33.7</td>
<td>31.4</td>
<td>31.4</td>
<td>30.9</td>
<td>25.2</td>
</tr>
<tr>
<td>Internet-enabled portable music players</td>
<td>17.0</td>
<td>20.1</td>
<td>21.4</td>
<td>23.8</td>
<td>18.4</td>
<td>17.3</td>
<td>15.3</td>
<td>13.8</td>
<td>14.2</td>
<td>10.8</td>
</tr>
<tr>
<td>Other Internet enabled appliances (smart appliances)</td>
<td>3.5</td>
<td>6.2</td>
<td>12.7</td>
<td>8.8</td>
<td>7.6</td>
<td>8.1</td>
<td>9.0</td>
<td>2.1</td>
<td>6.9</td>
<td>3.6</td>
</tr>
</tbody>
</table>

(Notes)

*1 Commercialization and video/DVD production rights do not cover character goods sales or video/DVD sales.
*2 Those that cannot be clearly classified into any category are included into the program broadcasting right category. Broadcast content exports that failed to be broken down by category are included into the program broadcasting right category.
*3 Calculations for FY 2016 and later include digital gaming rights in commercialization rights.

(Source) Prepared from MIC “Survey on the State of Overseas Expansion of Broadcast Content”

Figure 4-2-1-1 Changes in ownership rates for ICT devices (households)
b. Purpose for using the Internet

- "Sending and receiving email" was the most common purpose for using the Internet. While among all age groups, the most common purpose for using the Internet was "sending and receiving email", the number of users varies by age groups for "using video posting / sharing sites" and "using online games" (Figure 4-2-1-4).

Figure 4-2-1-3 Device used for Internet by category

(Note) Figures indicate the percentage of people who accessed the Internet using the corresponding device during the past twelve months. (Source) MIC "Communications Usage Trend Survey"

Figure 4-2-1-4 Applications / purpose for using the Internet by age group (multiple answers) (2020)

(Source) MIC "Communications Usage Trend Survey"
(3) Challenges for secure Internet usage

a. Concerns about Internet usage and issues with usage of ICT networks

- Individuals are concerned about leaks of personal information, and enterprises are concerned about computer-virus infections.

The percentage of individuals (aged 12 and older) who feel concerned about their Internet usage is 74.2 percent including both respondents who said they “feel concerned” and respondents who said they “feel rather concerned” (Figure 4-2-1-5). Among more specific concerns that they had about using the Internet, 91.6 percent cited “leak of personal information and Internet use history”. This was followed, in descending order, by “computer virus infections” (63.4 percent) and “concern about fraudulent emails or fraud over the Internet” (52.9 percent). “Concern about the reliability of electronic payment means” (40.5 percent) decreased by 2.8 percentage points over the previous year (Figure 4-2-1-6).

b. Information security measures

- Almost all enterprises have implemented some form of information security protective measures.

Looking at the state of information security protective measures taken by individuals that use the Internet shows that the leading security measures were “Updated a software” (57.6 percent) and “Installed an anti-virus software” (53.4 percent) (Figure 4-2-1-7).

Looking at the state of information security measures implemented by enterprises that use an ICT network, it shows that 98.2 percent of enterprises have implemented some form of security. The leading security measure was to “install anti-virus programs on PCs and other devices (operating system, software, etc.),” which 84.0 percent of enterprises have implemented. This was followed by the measure of “install anti-virus programs on servers” (63.7 percent) (Figure 4-2-1-8).

(4) Trends of enterprises using cloud services

a. Use of cloud services

- The percentage of enterprises using cloud services was nearly 70 percent.

Looking at the state of cloud service usage, 68.7 percent of enterprises answered they had used cloud services either partially or extensively, which is a significant rise of 4.0 percentage points from the previous year when it stood at 64.7 percent (Figure 4-2-1-9).
Figure 4-2-1-8 Implementation of information security measures by enterprises (multiple answers)

<table>
<thead>
<tr>
<th>Measure</th>
<th>2019 (n=2,115)</th>
<th>2020 (n=2,203)</th>
<th>2018 (n=2,071)</th>
<th>2017 (n=2,570)</th>
<th>2016 (n=2,071)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implemented some measures</td>
<td>97.8</td>
<td>97.4</td>
<td>97.7</td>
<td>96.0</td>
<td>96.3</td>
</tr>
<tr>
<td>Not implemented any particular measures</td>
<td>2.2</td>
<td>2.6</td>
<td>2.3</td>
<td>4.0</td>
<td>3.7</td>
</tr>
<tr>
<td>Install anti-virus programs on computers and other devices (operating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>system, software, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Install anti-virus programs on servers</td>
<td>84.0</td>
<td>83.2</td>
<td>82.5</td>
<td>81.5</td>
<td>81.4</td>
</tr>
<tr>
<td>Control access with IDs, passwords, etc.</td>
<td>63.7</td>
<td>63.1</td>
<td>62.4</td>
<td>61.3</td>
<td>60.7</td>
</tr>
<tr>
<td>Install and maintain firewalls</td>
<td>52.4</td>
<td>51.4</td>
<td>50.7</td>
<td>49.8</td>
<td>49.4</td>
</tr>
<tr>
<td>Training for employees</td>
<td>49.4</td>
<td>48.6</td>
<td>47.9</td>
<td>47.1</td>
<td>46.8</td>
</tr>
<tr>
<td>Apply security patches for operating systems</td>
<td>45.2</td>
<td>44.1</td>
<td>43.3</td>
<td>42.5</td>
<td>42.1</td>
</tr>
<tr>
<td>Establish security policies</td>
<td>44.1</td>
<td>43.1</td>
<td>42.4</td>
<td>41.6</td>
<td>41.2</td>
</tr>
<tr>
<td>Maintain access logs</td>
<td>40.1</td>
<td>39.3</td>
<td>38.6</td>
<td>37.9</td>
<td>37.5</td>
</tr>
<tr>
<td>Construct anti-virus walls at external access points</td>
<td>26.8</td>
<td>25.8</td>
<td>25.1</td>
<td>24.4</td>
<td>23.9</td>
</tr>
<tr>
<td>Encrypt data or networks</td>
<td>25.1</td>
<td>24.4</td>
<td>23.8</td>
<td>23.4</td>
<td>23.0</td>
</tr>
<tr>
<td>Use proxy servers, etc.</td>
<td>23.9</td>
<td>23.8</td>
<td>23.4</td>
<td>23.1</td>
<td>22.9</td>
</tr>
<tr>
<td>Line monitoring</td>
<td>23.8</td>
<td>23.4</td>
<td>23.1</td>
<td>22.9</td>
<td>22.7</td>
</tr>
<tr>
<td>User authentication by means of authentication technologies</td>
<td>19.9</td>
<td>19.9</td>
<td>19.6</td>
<td>19.4</td>
<td>19.2</td>
</tr>
<tr>
<td>Outsource security management</td>
<td>19.2</td>
<td>19.0</td>
<td>18.7</td>
<td>18.4</td>
<td>18.2</td>
</tr>
<tr>
<td>Install and maintain intrusion detection systems (IDS)</td>
<td>19.0</td>
<td>18.7</td>
<td>18.4</td>
<td>18.2</td>
<td>18.0</td>
</tr>
<tr>
<td>Establish manuals on responding to viruses</td>
<td>17.7</td>
<td>17.7</td>
<td>17.4</td>
<td>17.1</td>
<td>17.0</td>
</tr>
<tr>
<td>Install and maintain Web application firewalls</td>
<td>17.0</td>
<td>16.7</td>
<td>16.4</td>
<td>16.1</td>
<td>16.0</td>
</tr>
<tr>
<td>Other measures</td>
<td>16.7</td>
<td>16.4</td>
<td>16.1</td>
<td>15.8</td>
<td>15.6</td>
</tr>
<tr>
<td>Encrypt data on servers</td>
<td>15.2</td>
<td>15.1</td>
<td>14.8</td>
<td>14.5</td>
<td>14.3</td>
</tr>
<tr>
<td>Apply security patches for operating systems</td>
<td>15.1</td>
<td>15.0</td>
<td>14.7</td>
<td>14.4</td>
<td>14.2</td>
</tr>
<tr>
<td>Establish security policies</td>
<td>14.7</td>
<td>14.6</td>
<td>14.3</td>
<td>14.0</td>
<td>13.8</td>
</tr>
<tr>
<td>Maintain access logs</td>
<td>14.3</td>
<td>14.2</td>
<td>13.9</td>
<td>13.6</td>
<td>13.4</td>
</tr>
<tr>
<td>Use proxy servers, etc.</td>
<td>13.4</td>
<td>13.3</td>
<td>13.0</td>
<td>12.7</td>
<td>12.5</td>
</tr>
<tr>
<td>Line monitoring</td>
<td>12.5</td>
<td>12.4</td>
<td>12.1</td>
<td>11.8</td>
<td>11.6</td>
</tr>
<tr>
<td>User authentication by means of authentication technologies</td>
<td>12.3</td>
<td>12.2</td>
<td>11.9</td>
<td>11.6</td>
<td>11.4</td>
</tr>
<tr>
<td>Install and maintain intrusion detection systems (IDS)</td>
<td>11.4</td>
<td>11.3</td>
<td>11.0</td>
<td>10.7</td>
<td>10.5</td>
</tr>
<tr>
<td>Establish manuals on responding to viruses</td>
<td>10.5</td>
<td>10.4</td>
<td>10.1</td>
<td>9.8</td>
<td>9.6</td>
</tr>
<tr>
<td>Install and maintain Web application firewalls</td>
<td>9.6</td>
<td>9.5</td>
<td>9.2</td>
<td>8.9</td>
<td>8.7</td>
</tr>
<tr>
<td>Other measures</td>
<td>9.3</td>
<td>9.2</td>
<td>8.9</td>
<td>8.6</td>
<td>8.4</td>
</tr>
</tbody>
</table>

(Source) MIC “Communications Usage Trend Survey”

Figure 4-2-1-9 Use of cloud services

<table>
<thead>
<tr>
<th>Year</th>
<th>Used company wide</th>
<th>Used by some offices or divisions</th>
<th>Not used, but planning to use in the future</th>
<th>Not used and no plans to use in the future</th>
<th>Do not understand cloud services</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>248</td>
<td>229</td>
<td>65</td>
<td>29</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>2017</td>
<td>250</td>
<td>275</td>
<td>65</td>
<td>29</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>2018</td>
<td>254</td>
<td>296</td>
<td>65</td>
<td>29</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>2019</td>
<td>263</td>
<td>310</td>
<td>65</td>
<td>29</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>2020</td>
<td>268</td>
<td>324</td>
<td>65</td>
<td>29</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

(Source) MIC “Communications Usage Trend Survey”

Chapter 4
b. Effectiveness of cloud services
• Many enterprises recognize cloud services as being effective

Among the enterprises that do use cloud services, 87.1 percent responded that they found it to be “very beneficial” or “somewhat beneficial” (Figure 4-2-1-10).

c. Breakdown of cloud service usage
• The most frequently used cloud service is “file storage and data sharing”

The most frequently used cloud service is “file storage and data sharing”, as cited by 59.4 percent of respondents, this is followed, by “email” with 50.3 percent and “information sharing/portal” with 44.8 percent. Very advanced use of cloud services, such as utilizing it for “sales support” or “production management”, is still rather limited (Figure 4-2-1-11).

(5) Introduction and usage of IoT/AI systems and services by enterprises
a. Introduction of IoT/AI systems and services
• Approximately 20 percent of enterprises have introduced, or are planning to introduce, IoT/AI systems and services.

Enterprises that have already introduced IoT/AI systems and services, for example, in order to collect and analyze digital data, accounted for 12.4 percent of all enterprises. We can see that if enterprises that are planning to introduce these kinds of systems and services in the future are included, then this accounts for 20 percent of the total (Figure 4-2-1-12).

b. Purpose behind collecting and analyzing digital data
• About 80 percent of enterprises collect and analyze digital data to raise job performance and improve business processes

Looking at the purpose for collecting and analyzing digital data, the most frequent answer was “to raise job performance and improve business processes” with 81.3 percent, this was followed by “to improve customer services” (33.7 percent) and “for the optimization of projects” (22.6 percent) (Figure 4-2-1-13).

c. Impact of introducing IoT/AI systems and services
• About 70 percent of enterprises recognized that there had been positive impacts

Looking at the impact of IoT/AI systems and services, enterprises that responded it had been “very beneficial” or “somewhat beneficial” totaled 81.1 percent of all enterprises (Figure 4-2-1-14).
Figure 4-2-1-12 Current state of the introduction of IoT/AI systems and services

2020 (n=2,220)

- Not introduced: 69.8%
- Not introduced, but planning to in the future: 9.7%
- Introduced or planning to in the future: 22.2%

(Source) MIC “Communications Usage Trend Survey”

Figure 4-2-1-13 Purpose behind collecting and analyzing digital data

- To raise job performance and improving business: 83.5%
- To improve customer services: 34.0%
- For the optimization of projects: 25.0%
- To improve customer services: 22.6%
- New business/management: 15.9%
- Business continuity: 13.9%
- Other: 10.4%

2020 (n=302) 2019 (n=291)

(Source) MIC “Communications Usage Trend Survey”

Figure 4-2-1-14 Impact of introducing IoT/AI systems and services

- “Very beneficial” or “Somewhat beneficial”: 81.1%
- Somewhat beneficial: 61.5%
- Very beneficial: 19.5%
- Not very beneficial: 1.9%
- Do not know the impact: 17.0%
- Negative impact: 0.0%

2020 (n=296)

(Source) MIC “Communications Usage Trend Survey”
2. State of provision and usage of telecommunication services

(1) State of provision of telecommunication services

a. Overview

(i) Subscriptions to voice communication services

- Subscriptions to mobile communications and 0ABJ-IP phone services have steadily increased.

Subscriptions to fixed communications (including NTT East and West subscription telephone services (including ISDN), non-NTT telephone services, and CATV tele- phone services but excluding 0ABJ-IP phone services) have been declining, while those for mobile communications (mobile phones, PHS and BWA) and 0ABJ-IP phone services have been growing steadily. Subscriptions to 050-IP phone services have been flat in recent years.

There were about 11.4 times more mobile communications subscriptions than fixed communications subscriptions (Figure 4-2-2-1).

(ii) Broadband usage

- Subscriptions to mobile ultra-high-speed broadband services have leaped dramatically year on year.

The number of subscriptions to fixed line broadband services\(^5\) at the end of FY 2020 stood at 42.68 million (up by 3.6 percent from the previous year). Subscriptions to mobile ultra-high-speed broadband services was 154.37 million for 3.9G and 4G (LTE) services (up by 1.1 percent from the previous year), and 75.05 million for BWA services (up by 5.4 percent from the previous year) (Figure 4-2-2-2). Trends for the net increase in the number of subscriptions to FTTH and DSL show that DSL continues to decrease while FTTH continues to increase.

b. Mobile communications

- Subscriptions to mobile communication services have risen each year.

The proportion of subscriptions to MVNO services across all mobile communication subscriptions also surged.

Subscriptions to mobile communications\(^7\) (mobile phones, PHS and BWA) at the end of FY 2020 totaled 195.12 million (up by 4.5 percent from the previous year). Net growth in comparison to the end of FY 2019 was 8.49 million subscriptions, which demonstrates a continuing upward trend (Figure 4-2-2-3).

By carrier, the market share for mobile communication subscriptions was 36.9 percent for NTT Docomo (down by 0.4 percentage points from the same month a year before), 27.1 percent for the KDDI Group (down by 0.5 percentage points from the same month a year before), and 21.1 percent for SoftBank (down by 0.7 percentage points from the same month a year before) and 1.5 percent for Rakuten Mobile (up by 1.5 percentage points from the same month a year before) (Figure 4-2-2-4). By carrier, market share for MVNO services was 5.5 percent for NTT Docomo MVNO (down by 0.2 percentage points from the same month a year before), 3.8 percent for the KDDI Group MVNO (±0.0 percentage points from the same month a year before), and 4.1 percent for SoftBank MVNO (up by 0.4 percentage points from the same month a year before).

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Figure 4-2-2-1  Changes in subscriptions for voice communication services

![Chart showing changes in subscriptions for voice communication services](chart.png)

(Notes)

* 1 Subscriptions for mobile communications cover mobile phones, PHS services and BWA.
* 2 Figures for mobile communications from FY 2013 onward are ‘after adjusting for internal group transactions’. ‘After adjusting for internal group transactions’ refers to adjustments made to count 1 mobile phone device as 1 contract and not 2 contracts, so as not to diverge from the actual state, when an MNO receives mobile phone or BWA services as an MVNO from another MNO in the same group and provides these services together with its own services to 1 mobile phone device.
* 3 Figures of the past years are different from those in last year’s publication due to amendments by the target enterprises.

(Source) Prepared from MIC “Official Announcement of Quarterly Data on the Number of Telecommunications Service Subscriptions and Market Share (FY2020 Q4 (End of March))”

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\(^5\) Non-NTT services are subscriber phone services provided by telecom carriers other than NTT East and West and cover direct subscriber telephone, ISDN services, new-type non-NTT telephone, and ISDN services.

\(^6\) Figures for subscriptions to fixed-line broadband services cover FTTH, DSL, cable TV, and FWA services.

\(^7\) Figures after adjusting for internal group transactions.
Subscriptions for MVNO services\(^8\), out of subscriptions for mobile communications (mobile phones, PHS handsets, and BWA), continue to increase, and reached 26.12 million in FY 2020 (an increase of 5.6 percent) (Figure 4-2-2-5).

(2) Telecommunication usage

a. State of traffic

(i) Internet traffic

- The total download traffic of fixed-broadband service subscribers in Japan reached an average of 19.9 Tbps as of November 2020, 56.7 percent increase from the same month in the year before

(a) Changes in traffic by fixed-broadband subscribers

Traffic by the fixed-broadband service subscribers of ISP\(^9\) continues to grow, with download traffic (A1 OUT) reaching a monthly average of 12,885.5 Gbps in November 2020 (a 49.1 percent increase from the same month the year before). Download traffic (A1 OUT) is 8.4 times larger than upload traffic (A1 IN: 1542.7 Gbps), thus, most traffic is download traffic (Figure 4-2-2-6).

(b) Changes in traffic exchanged between ISPs

Data inflow has exceeded outflow in all three types of traffic between ISPs: the traffic exchanged with major domestic internet exchanges (IXs)\(^{10}\) (B1), the traffic exchanged with domestic ISPs without passing through major domestic IX (B2), and the traffic exchanged with overseas ISPs (B3) (Figure 4-2-2-6).

(Notes)
* 1 After adjusting for internal group transactions’ refers to adjustments made to count 1 mobile phone device as 1 contract and not 2 contracts so as not to diverge from reality, such as when an MNO receives mobile phone or BWA services as an MVNO from another MNO in the same group and provides these services together with its services in 1 mobile phone device.

* 2 Figures of the past years are different from those in last year’s publication due to amendments by target enterprises.

(Source) Prepared from MIC “Official Announcement of Quarterly Data on the Number of Telecommunications Service Subscriptions and Market Share (FY2020 Q4 (End of March))”

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\(^8\) Figures after subtracting subscriptions to MVNOs that are MNOs.

\(^9\) The total for nine cooperating ISPs, namely the Internet Initiative Japan (IIJ), NTT Communications, NTT Plala Inc., OPTAGE Inc., KDDI, Jupiter Telecommunications Co., Ltd., SoftBank Corp., NIFTY Corporation, and BIGLOBE Inc.

\(^{10}\) The total for IXs run by Internet Multifeed, Equinix Japan, Japan Internet Exchange, BBIX, and WIDE Project.
Estimations for Internet traffic in Japan

MIC have estimated the total download traffic by broadband service subscribers in Japan from A1 — the traffic of ISP9 broadband service subscribers (DSL, FTTH, CATV, FWA) — and the percentage of the nine ISP’s subscriptions among all fixed-broadband subscriptions in Japan. This estimate found that traffic circulating on the internet, on average, was approximately 19.9 Tbps during November 2020. This is a 56.7 percent increase from the same month a year ago, and demonstrates a continuing rise in internet traffic (Figure 4-2-2-6).

Mobile communication traffic

- Mobile communication traffic increased at a rate of about 1.3 times over the last year

The rapid increase in traffic, particularly data communications, in recent years is a significant factor in radio spectrum congestion in the frequencies assigned to mobile communication systems. In view of this, five mobile communications carriers (NTT Docomo, KDDI, SoftBank, UQ Communications, and Wireless City Planning) worked together to tabulate and analyze data on the volume of mobile communication traffic (non-voice traffic). They found that, as of September 2020, mobile communication traffic increased about 1.3 times over the last year, and has reached an average of 4491.8 Gbps (Figure 4-2-2-7).
**Figure 4-2-6** Estimates for Internet traffic in Japan*1*2

**[Traffic estimates]**

<table>
<thead>
<tr>
<th>Year</th>
<th>Month</th>
<th>Total traffic by broadband service subscribers in Japan (estimated) [Gbps]*1</th>
<th>Traffic per broadband service subscriber (estimated) [kbps]*1</th>
<th>(A1) Traffic by broadband service subscribers (DSL, FTTTH, CATV, FWA etc.) (Gbps)</th>
<th>(A2) Traffic by other subscribers (leased lines, data centers, etc.) [Gbps]</th>
<th>(B1) Traffic exchanged between major domestic IXs and ISP9 (Gbps)</th>
<th>(B2) Traffic exchanged between domestic IXs and ISP9 without passing through major domestic IXs (Gbps)</th>
<th>(B3) Traffic exchanged between overseas IXs and ISP9 [Gbps]</th>
<th>(D) Share of nine cooperating ISPs X</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>5</td>
<td>1,309</td>
<td>10,289</td>
<td>33.2</td>
<td>261.1</td>
<td>870.1</td>
<td>6,837.9</td>
<td>1,441.0</td>
<td>726.4</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>1,407</td>
<td>10,976</td>
<td>35.1</td>
<td>275.1</td>
<td>929.1</td>
<td>7,281.8</td>
<td>1,921.4</td>
<td>862.7</td>
</tr>
<tr>
<td>2019</td>
<td>5</td>
<td>1,563</td>
<td>12,086</td>
<td>36.7</td>
<td>298.9</td>
<td>1,016.7</td>
<td>7,859.6</td>
<td>2,159.4</td>
<td>948.9</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>1,571</td>
<td>12,650</td>
<td>38.4</td>
<td>309.2</td>
<td>1,073.0</td>
<td>8,641.0</td>
<td>2,323.4</td>
<td>956.5</td>
</tr>
<tr>
<td>2020</td>
<td>5</td>
<td>2,321</td>
<td>19,025</td>
<td>56.1</td>
<td>460.2</td>
<td>1,534.3</td>
<td>12,756.6</td>
<td>2,968.1</td>
<td>2,420.1</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>2,373</td>
<td>19,821</td>
<td>56.2</td>
<td>469.4</td>
<td>1,542.7</td>
<td>12,885.5</td>
<td>2,787.3</td>
<td>2,552.4</td>
</tr>
</tbody>
</table>

*1 The total traffic at a major domestic IX does not include the traffic between major domestic IXs.

*2 In 2017, the traffic at major domestic IXs was estimated from the traffic of broadband service subscribers of the nine cooperating ISPs.

*3 Traffic exchanged between major domestic IXs was estimated from the traffic of broadband service subscribers of the nine cooperating ISPs.

*4 Total traffic exchanged between major domestic IXs was estimated from the traffic of broadband service subscribers of the nine cooperating ISPs.

**Notes**

- B Traffic exchanged between major domestic IXs
- A Traffic exchanged with major domestic IXs
- A1 Traffic exchanged between major domestic IXs provided by domestic IXs
- A2 Traffic exchanged between major domestic IXs provided by major domestic IXs and ISP9
- B1 Traffic exchanged with major domestic IXs
- B2 Traffic exchanged between major domestic IXs and ISP9 without passing through major domestic IXs
- B3 Traffic exchanged with overseas IXs
- D Share of nine cooperating ISPs X

**Figure 4-2-7** Transitions in the monthly average communications traffic in Japan

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Average monthly traffic</strong></td>
<td>up</td>
<td>down</td>
<td>total</td>
<td>up</td>
<td>down</td>
<td>total</td>
<td>up</td>
</tr>
<tr>
<td><strong>Average(GBps)</strong></td>
<td>4046.4</td>
<td>2685.6</td>
<td>3062.2</td>
<td>423.7</td>
<td>2065.9</td>
<td>3350.1</td>
<td>447.4</td>
</tr>
</tbody>
</table>

(Source) Prepared from MIC "Information and Communications Statistics Database"
3. State of provision and usage of broadcasting services

- Subscriptions to NHK terrestrial, NHK-BS, 110° East CS and cable TV services in FY 2019 increased from the previous year.
- Subscriptions to all broadcasting services increased in FY 2019, except for WOWOW and 124/128° East CS broadcasts (Figure 4-2-3-1).

4. State of informatization in government services

1) Promoting e-government

- Promotion of e-government based on the inventory of administrative procedures

In order to improve the convenience of overall administrative services, the Cabinet Secretariat conducted a detailed survey on government administrative procedures (inventory survey). The results show that about 4.1% (2,565 types) of all types of procedures (62,253 types), which had more than 0.01 million filings in a year, accounted for 99% (approximately 2.5 billion) of the sum of procedure filings.

2) Promoting online governance by local governments

a. Use of online procedures

- The online usage rate of procedures prioritized by local governments for online availability increased over the previous fiscal year.

The online usage rate of local government administrative procedures\(^1\) was 47.5 percent in FY 2019 (Figure 4-2-4-1).
The number of radio stations in Japan has increased steadily since 2006. The number of radio stations (excluding PHS and wireless LAN handsets and other radio stations for which no license is required) at the end of FY 2020 increased by 4.1 percent from a year earlier to 277.11 million, including 273.79 million mobile phones and other land mobile stations. Mobile phones and other mobile land stations accounted for 98.8 percent of all radio stations. The number of convenience stations climbed by 3.1 percent from the previous year to 1.37 million (Figure 4-3-1-1).

### Section 3  Radio Spectrum Usage Trends

#### 1. State of Usage and number of radio stations

**Radio stations**

- The number of radio stations in Japan has increased steadily since 2006. The number of radio stations (excluding PHS and wireless LAN handsets and other radio stations for which no license is required) at the end of FY 2020 increased by 4.1 percent from a year earlier to 277.11 million, including 273.79 million mobile phones and other land mobile stations. Mobile phones and other mobile land stations accounted for 98.8 percent of all radio stations. The number of convenience stations climbed by 3.1 percent from the previous year to 1.37 million (Figure 4-3-1-1).

**Note**

The total yearly filings are an estimate for the entire country calculated based on the total number of filings and the populations in the jurisdictions of local governments that had already placed the targeted procedures online. (Source) MIC “State of Online Use of Procedure, Notification etc. by Local Public Entities in FY 2019”

![Diagram showing changes in the number of radio stations](image)

![Diagram showing changes in the online usage of procedures prioritized by local governments for online availability](image)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total procedure filings for the year</th>
<th>Filings done online</th>
<th>Online usage rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>460,861,000</td>
<td>206,524,000</td>
<td>44.8</td>
</tr>
<tr>
<td>2018</td>
<td>473,848,000</td>
<td>214,937,000</td>
<td>45.4</td>
</tr>
<tr>
<td>2019</td>
<td>472,618,000</td>
<td>224,346,000</td>
<td>47.5</td>
</tr>
</tbody>
</table>

*(Note)*

*1* “Land mobile station” refers to a radio station that is operated either while in motion on land or while stationary in an unspecified location (such as mobile phones).

*2* “Convenience station” refers to a radio station used for simple radio communications.
2. Radio monitoring to eliminate interference with important radio communications

- There were 429 reports of interference with important radio communications in FY 2020, and 643 actions were taken against illegal radio stations.

In the interests of eliminating radio interference and obstructions and maintaining a favorable radio spectrum usage environment, officials at the 11 Regional Bureaus of Telecommunications and elsewhere use illegal radio station search vehicles and sensor stations installed in towers and on building rooftops in major urban areas nationwide. These investigate the sources of radio signals that interfere with fire and emergency services radio, aeronautical and maritime radio, mobile phones, and other important radio communications. Officials also crack down on illegal radio stations and undertake public awareness activities to ensure more people use the radio spectrum properly.

Since FY 2010, radio authorities have been working to promptly eliminate interference with important radio communications with a system that can receive interference reports around the clock. Radio authorities also monitor shortwave radio and cosmic radio waves from international radio surveillance facilities registered with the International Telecommunication Union (ITU).

In FY 2020, there were 2,039 reports of radio interference or obstructions of all kinds, 153 more (up by 8.1 percent from the previous year). Among these, there were 429 reports of interference with important radio communications, 32 less (down by 6.9 percent from the previous year). In response to these reports, 2,198 actions\textsuperscript{12} were taken in FY 2020 (Figure 4-3-2-1).

In FY 2020, 6,765 illegal radio stations were detected, 228 more (up by 3.5 percent from the previous year). In response, 643 actions\textsuperscript{12} were taken in FY 2020, a decrease of 604 actions (down by 48.4 percent from the previous year). These actions included 62 indictments (9.6 percent of all actions) and 581 directives (90.4 percent of all actions).

\textsuperscript{12} The number of actions includes incomplete actions remaining from the previous fiscal year.

Figure 4-3-2-1  Changes in the number of radio station interference / obstruction reports and the number of actions taken in response

<table>
<thead>
<tr>
<th>Year</th>
<th>Reports of interference with important radio communications</th>
<th>Other interference reports</th>
<th>Actions taken in response to reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>532</td>
<td>2,773</td>
<td>2,772</td>
</tr>
<tr>
<td>2009</td>
<td>513</td>
<td>2,564</td>
<td>2,289</td>
</tr>
<tr>
<td>2010</td>
<td>689</td>
<td>2,623</td>
<td>2,669</td>
</tr>
<tr>
<td>2011</td>
<td>501</td>
<td>2,374</td>
<td>2,453</td>
</tr>
<tr>
<td>2012</td>
<td>532</td>
<td>2,358</td>
<td>2,389</td>
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<tr>
<td>2013</td>
<td>605</td>
<td>2,766</td>
<td>2,667</td>
</tr>
<tr>
<td>2014</td>
<td>771</td>
<td>2,497</td>
<td>2,346</td>
</tr>
<tr>
<td>2015</td>
<td>676</td>
<td>2,414</td>
<td>2,348</td>
</tr>
<tr>
<td>2016</td>
<td>603</td>
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<tr>
<td>2017</td>
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</tr>
<tr>
<td>2019</td>
<td>461</td>
<td>2,414</td>
<td>2,348</td>
</tr>
<tr>
<td>2020</td>
<td>429</td>
<td>2,414</td>
<td>2,348</td>
</tr>
</tbody>
</table>

\(\text{(FY)}\)