Chapter 4

ICT and Future Lifestyles

Part 2

Section 1 New Forms of ICT Devices: After the Smartphone

This section focuses on three types of ICT devices—wearable devices, connected vehicles and autonomous vehicles, and partner robots—tabbed for particularly rapid growth in the near future. We analyze consumer intention to use these devices and probe what impact the growth of these ICT devices may have on future lifestyles.

1. Wearable devices

Wearable devices are ICT devices worn and operated on the arm, head, or other parts of the body. Using sensors, the devices collect and transmit biological data about the wearer. The data can then be analyzed in the cloud and used to give the wearer feedback. Wearables are expected to find a variety of applications in fitness, health care, and similar fields. Wearables are also starting to be used in conjunction with smartphones for hands-free control of apps and for assisting work operations in industrial fields.

(1) Interest in using wearables

A number of companies have started offering different kinds of wearable devices, and the market is tipped for enormous growth. But how much actual awareness do consumers have about these devices? For this report, we selected 2,000 monitors and surveyed their intentions to use wearable devices.

As described above, many consumer-aimed wearable devices are expected to be used in the health field. Therefore, for the purposes of this survey, the monitors were asked about their intention to use health management services that rely on wearable devices. More than a third of the respondents (37.7 percent) replied that they had an intention to use wearable devices in this context (total of respondents who answered "would like to use" and "would consider using") (Figure 4-1-1-1).

By age bracket, the 30s cohort had the highest intention to use (total of respondents who answered "would like to use" and "would consider using"), at over 40 percent. In general, the higher the age bracket, the lower the intention to use. Only 34.5 percent of respondents 60 and older said they had an intention to use health management services that rely on wearable devices.

We also broke down the intention to use figures by smartphone users and non-users. More than 40 percent of smartphone users said they had an intention to use ("would like to use" + would consider using"), whereas only 32.5 percent of non-users answered in the affirmative. These results suggest that smartphone users have hopes for health management services that rely on wearable devices as a new use for their smartphones (Figure 4-1-1-2).

Figure 4-1-1-1 Intention to use health management services that rely on wearable devices

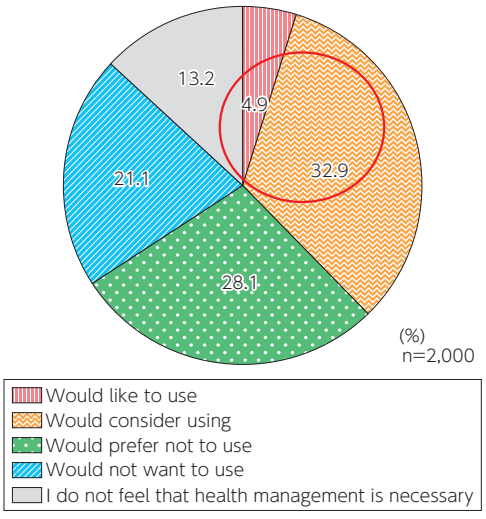
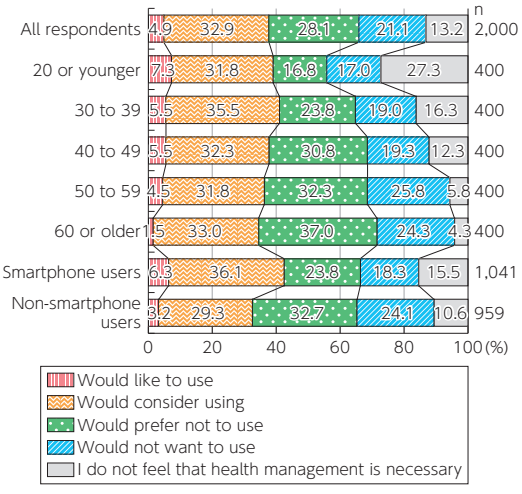


Figure 4-1-1-2 Intention to use health management services that rely on wearable devices (by age bracket and smartphone ownership)



(Source) "Study Report on People's Attitudes toward New ICT Services and Technologies that Resolve Social Issues," MIC (2015)

2. Connected vehicles and autonomous vehicles

(1) Connected vehicles

Connected vehicles are vehicles with ICT device functions. Sensors on the vehicles collect many kinds of data, such as the vehicle's operational status and the surrounding road conditions. By accumulating and analyzing these data via networks, new value is expected to be generated. For example, some applications that are just reaching commercial viability are systems that automatically place an emergency call in the event of an accident, telematics auto insurance that adjusts insurance rates based on driver behavior, and systems that track the position of a vehicle if stolen.

(2) Autonomous vehicles

Almost all vehicles on the road today require the driver to manually operate the steering wheel, accelerator pedal, and brakes. Autonomous vehicles, in contrast, have been gaining attention lately because the vehicle drives itself safely, following instructions, to the specified destination while accounting for road and traffic conditions without the driver directly intervening in its operation. Autonomous vehicles work by combining sensing, which measures conditions and situations inside and outside the vehicle, with other technologies, such as ICT technologies and automated vehicle control technologies.

Companies are very active in pushing toward practical autonomous vehicles, but what is the actual level of interest in autonomous vehicles among consumers?

In our survey, we asked the monitors about their intention to use autonomous vehicles after defining an autonomous vehicle as "a vehicle that maintains an awareness of the surrounding conditions and drives autonomously by means of radar and sensors and that can find the optimal route to a destination just by selecting the desired destination."

The results found that more than half (54.6 percent) of the respondents had an intention to use autonomous cars (total of respondents who answered "would like to use" and "would consider using") (Figure 4-1-2-1). By age bracket, respondents 60 and older had the highest intention to use (total of respondents who answered "would like to use" and "would consider using"), at nearly 60 percent. This finding suggests that there are mounting high expectations among seniors for autonomous vehicles as means of getting around without the difficulty of driving (Figure 4-1-2-2).

Figure 4-1-2-1 Intention to use autonomous vehicles

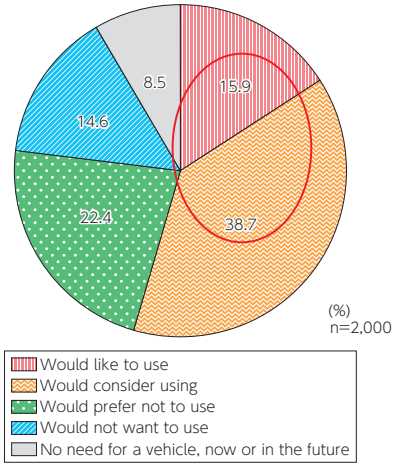
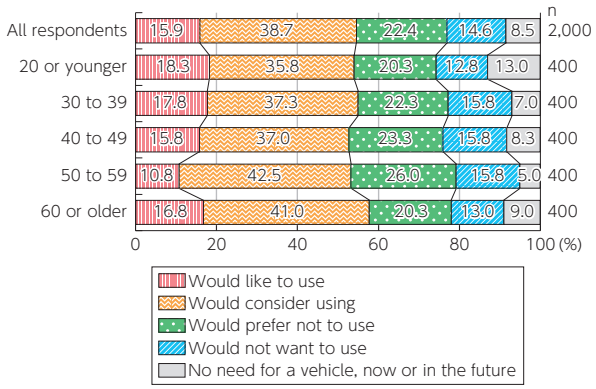


Figure 4-1-2-2 Intention to use autonomous vehicles(by age bracket)



(Source) "Study Report on People's Attitudes toward New ICT Services and Technologies that Resolve Social Issues," MIC (2015)

3. Partner robots

The development of robot technology has been primarily focused on industrial robots that operate in factories and plants. Domestic robots, on the other hand, have been mainly the stuff of science fiction—i.e., life-service robots that help with chores, caregiving, and raising children in the home or serve as communication partners for people—and only a few have been developed into commercial products. In recent years, however, there has been growing interest in such robot applications in the life services field.

The future partner robot market is predicted to skyrocket. Although Japanese corporations have been developing and marketing rudimentary domestic robot products, how interested are consumers in them? We verified the intention to use partner robots among consumers with a survey that asked about three different fields—caregiving, communications, and child-raising—that are anticipated to become leading application fields for partner robots.

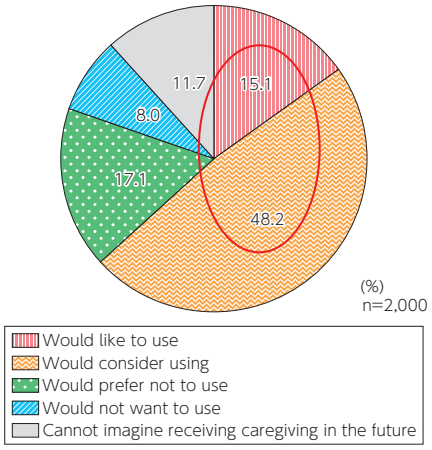
(1) Intention to use caregiving robots

Caregiving is expected to become one of the leading application fields for partner robots. Some preliminary trials are already in progress to gauge the application of robot technology in the caregiving field. Since robot technology is advancing day by day, it is difficult to make a one-size-fits-all definition of caregiving robots. Nevertheless, for the purposes of this survey, we assumed a

broad potential for caregiving robots, in anticipation of future technological advances. Therefore, we asked the monitors about their level of interest in caregiving robots after defining an caregiving robot as "a robot that functions to help caregivers with toileting (attending the care-recipient while toileting, changing diapers, etc.), with bathing (attending the care-recipient while bathing, washing the care-recipient, etc.), with meals (preparing meals and assisting the care-recipient during meals), and with movement (assisting the care-recipient when moving from a wheelchair to a bed, toilet, bathtub, or chair), thereby reducing the caregivers' workload, and that functions to inform caregiving service facilities about the care-recipient's health status via the Internet."

When the respondents were asked about their intention to use caregiving robots assuming that they were the caregiver to a family member, over 60 percent (63.3 percent) replied that they had an intention to use (total of respondents who answered "would like to use" and "would consider using") (Figure 4-1-3-1).

Figure 4-1-3-1 Intention to use caregiving robots (respondent as caregiver)



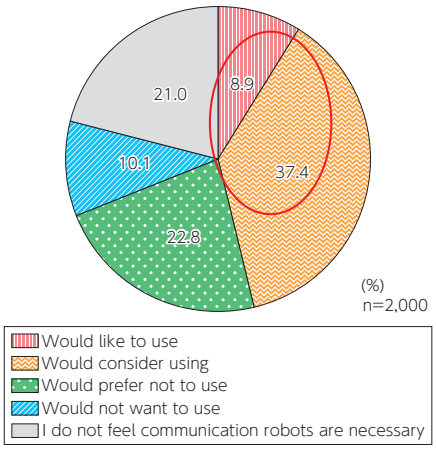
(Source) "Study Report on People's Attitudes toward New ICT Services and Technologies that Resolve Social Issues," MIC (2015)

(2) Intention to use communication robots

The development of communication robots has moved forward with advances in artificial intelligence, and these robots can now hold conversations, dance or exercise with people, and be partners in quizzes and games. There are hopes that communicating with robots will stimulate people's brains and, thus, have a preventative effect against dementia and that exercising moderately with robots will ward off muscle atrophy and emaciation and keep people from becoming bedridden. It is also possible for communication robots to act as pets for people who live in places where pets are forbidden. The survey asked the monitors about their intention to use such communication robots.

Close to half of the respondents (46.2 percent) replied that they had an intention to use communication robots (total of respondents who answered "would like to use" and "would consider using"), a figure lower than that for caregiving robots (Figure 4-1-3-2).

Figure 4-1-3-2 Intention to use communication robots



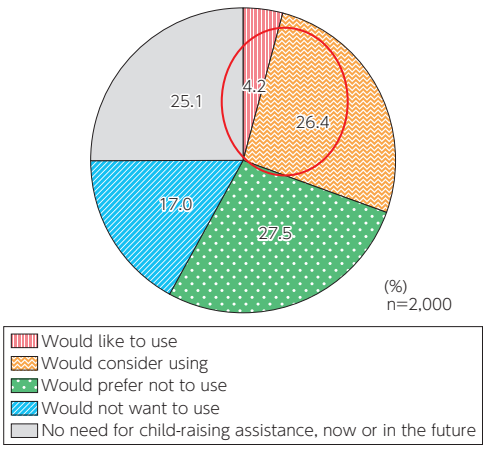
(Source) "Study Report on People's Attitudes toward New ICT Services and Technologies that Resolve Social Issues," MIC (2015)

(3) Intention to use robots to assist child-raising

Another envisioned future application of robots is assisting child-raising. Robots are expected to lessen some of the child-raising burden by talking and playing with children and watching over them for short periods of time. Furthermore, robots can constantly monitor a child's situation and, thus, potentially improve child safety. Robots may also be equipped with functions to check children's health conditions, such as detecting when a child starts to develop a fever. In the survey, we asked the monitors about their intention to use such robots to assist child-raising.

Only about 30 percent of the respondents replied that they had an intention to use robots to assist child-raising (total of respondents who answered "would like to use" and "would consider using"). Compared to caregiving robots and communication robots, these robots have the lowest intention to use at the present time (Figure 4-1-3-3).

Figure 4-1-3-3 Intention to use robots to assist child-raising



(Source) "Study Report on People's Attitudes toward New ICT Services and Technologies that Resolve Social Issues," MIC (2015)

Section 2 Transformations Resulting from Social Media Growth

This section develops an understanding of trends in the sharing economy, one of the transformations resulting from social media growth. We also analyze, by means of a survey, consumer interest in the sharing economy and some the issues caused by the expansion of the sharing economy.

Furthermore, the broad penetration of social media has brought with it the potential for problematic posts to be disseminated widely in an instant and for posters to be exposed to unexpected social backlash. Therefore, we will examine developments in the problems of going viral and flaming, as another transformation resulting from social media growth, and analyze, by means of a survey, user awareness of these problems and future issues.

1. The sharing economy: a new economy driven by social media

(1) What is the sharing economy?

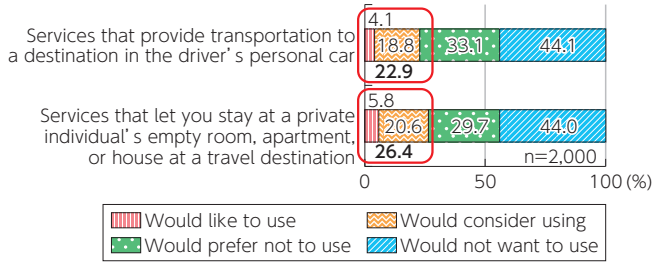
The sharing economy typically refers to services that list idle assets owned by individuals that are for hire (assets include skills and other intangibles as well). The sharing economy is a win-win situation where lenders can earn money from their idle assets while renters can make use of the assets without owning them. For such services to function, there has to be an assurance of trust between the parties. This is where social media comes into play, with its unique ability to operate loosely arranged community functions founded on the exchange of information. Originating from Silicon Valley, the sharing economy has now expanded globally.

(2) Demand for sharing-economy-style services

We asked Japanese consumers about their intention to use two different types of sharing-economy-style services that are gaining traction overseas. The results found that 22.9 percent of the respondents had an intention to use ("would like to use" + "would consider using") "services that provide transportation to a destination in the driver's personal car" and 26.4 percent of the respondents had an intention to use ("would like to use" + "would consider using") "services that let you stay at a private individual's empty room, apartment, or house at a travel destination." In both cases, more respondents replied that they have no intention to use the services ("would not like to use" + "would prefer not to use") (Figure 4-2-1-1). These results indicate that many Japanese consumers are cautious about using these services at the present time.

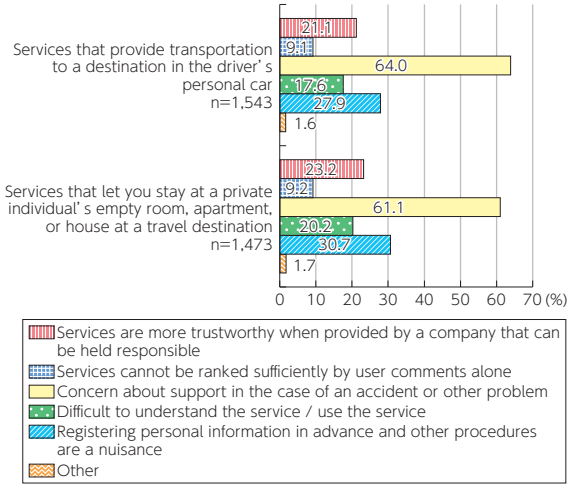
We asked respondents that had replied they have no intention to use the services (respondents who answered "would prefer not to use" or "would not like to use") for their reasons. The most common answer, given by about 60 percent of the respondents, was "concern about support in the case of an accident or other problem." This finding shows that improving trustworthiness is an issue for these services, as many people feel uneasy about the handling of accidents or other forms of trouble because the services are unfamiliar to them. Other reasons quoted by people—"services cannot be ranked sufficiently by user comments alone" and "services are more trustworthy when provided by a company that can be held responsible"—were not so common, at about 10 percent and 20 percent respectively (Figure 4-2-1-2). This suggests that on the whole people do accept the fundamental mechanism of sharing-economy-style services: i.e., the assurance of C2C service quality by means of user comments and rankings.

Figure 4-2-1-1 Intention to use overseas sharing-economy-style services



(Source) "Study Report on People's Attitudes toward New ICT Services and Technologies that Resolve Social Issues," MIC (2015)

Figure 4-2-1-2 Reasons for not wanting to use overseas sharing-economy-style services



(Source) "Study Report on People's Attitudes toward New ICT Services and Technologies that Resolve Social Issues," MIC (2015)

2. Viral posts and flaming on social media

(1) Background to the problems

Recently, some posters on Twitter, Facebook, and other social media have been subject to severe rebukes because of a careless post. Companies too have come under fire unexpectedly because of a consumer's post on social media. Such flaming incidents have drawn wide attention and major media outlets often cover them.

From the dawn of the Internet, things written by people about themselves or others on the Internet have caused trouble for individuals and companies, so the phenomenon itself is not new. However, the social media flaming that has drawn much attention in recent years is distinctive because it has been fueled by the functionality of Twitter, Facebook, and other social media. In particular, the social media functions that make it easy to share other people's posts you like with friends have led to careless posts going viral, where a post spreads rapidly to an extremely broad audience due to the chain reaction of sharing the post. Another factor that has given rise to flaming is the ease of posting controversial photos taken with smartphones on social media.

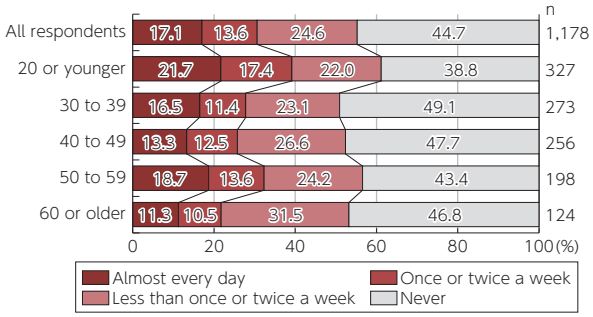
(2) Current state of sharing information on social media

More than half of all social media users "share" other people's posts with their friends (i.e., spreading information using a function such as Facebook's Like! function or Twitter's retweet function), and around 17 percent share information nearly every day. People 20 and younger are slightly more likely to be sharers, but there is no appreciable difference among the age brackets 30 and older. The findings show that people in all age brackets actively share information on social media (Figure 4-2-2-1).

(3) Criteria for deciding whether to share information

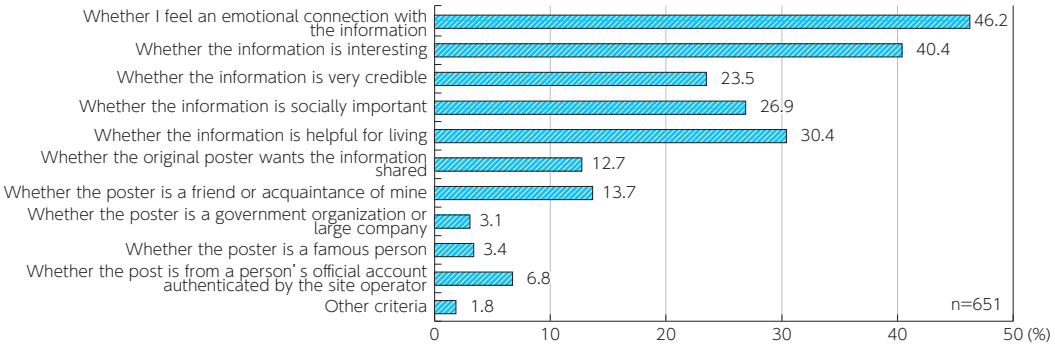
The next question we asked is by what criteria do social media users select information to share. The most frequent response, given by 46.2 percent of respondents, was "whether I feel an emotional connection with the information," followed by "whether the information is interesting," with a response rate of 40.4 percent. Conversely, "whether the information is very credible" was mentioned relatively infrequently, at 23.5 percent (Figure 4-2-2-2). These results suggest that social media users tend to select information to share based on whether they find the information empathic or interesting more that whether it is factual.

Figure 4-2-2-1 Experience with sharing information on social media (by age bracket)



(Source) "Study Report on People's Attitudes toward New ICT Services and Technologies that Resolve Social Issues," MIC (2015)

Figure 4-2-2-2 Criteria for deciding whether to share information



(Source) "Study Report on People's Attitudes toward New ICT Services and Technologies that Resolve Social Issues," MIC (2015)

Section 3 New Work Styles Made Possible by ICT: Telework's Potential

This section sorts out the current state of telework and its issues though an analysis of a survey given to employed people and companies. We also present specific examples of the potential of telework by presenting the results of interview surveys with actual teleworkers.

1. Telework awareness levels among companies and employed people

One of the reasons telework has not taken off is believed to be a lack of awareness about telework as a viable work style. To test this hypothesis, we surveyed the telework awareness levels among companies and employed people.

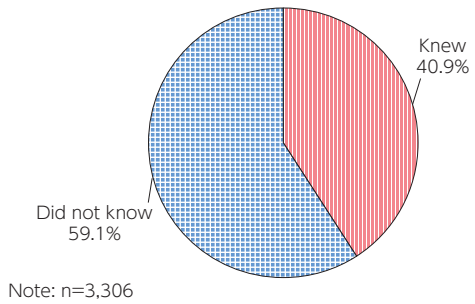
(1) Company awareness of telework is around 40 percent

Only 40 percent of the surveyed companies replied that they "knew" about telework (Figure 4-3-1-1). In general, the more employees a company had, the higher the awareness level. The awareness level among companies with 301 or more employees was about 70 percent, compared to about 30 percent among companies with 50 or fewer employees. The awareness level was significantly higher among ICT companies, at just under 70 percent, than companies in other industries.

(2) Awareness of telework among employed people is less than 50 percent

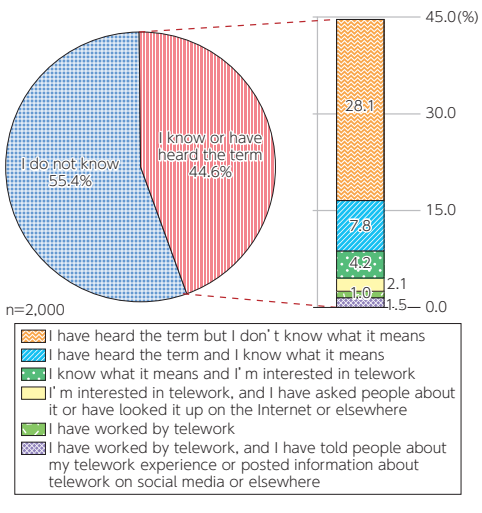
More than half of the surveyed employed people said they "do not know" about telework. Only around 45 percent of respondents said they "know or have heard" about telework. Of these respondents, about 30 percent answered "I have heard the term but I don't know what it means," which indicates that only a minority of people understand the telework concept (Figure 4-3-1-2). These results highlight that telework awareness levels are not particularly high, being less than 50 percent among companies and employed people alike. We can conclude the first step in promoting telework take-up is raising its awareness.

Figure 4-3-1-1 Awareness of telework among companies (all companies)



(Source) "Study Report on Revitalizing Local economies and Company ICT Use and Application," MIC (2015)

Figure 4-3-1-2 Awareness and use of telework among employed people



(Source) "Study Report on People's Attitudes toward New ICT Services and Technologies that Resolve Social Issues," MIC (2015)

2. Employed people's intention to use telework

We next surveyed the intention to use telework among employed people. We asked this question after explaining the telework concept to respondents who did not know about telework before the survey. We also asked respondents who do not work in an environment where telework is available whether they would like to use telework, assuming a work environment that permitted telework.

(1) More than 50 percent of employed people hope to use telework

The respondents who answered "already using telework," "actively want to use telework," and "would like to try using telework" added up to more than 50 percent of all respondents (Figure 4-3-2-1). This result indicates that many people have at least a latent desire to use telework. Even among respondents who had answered they "do not know" about telework to the previous question, more than 40 percent said that they "actively want to use telework" or "would like to try using telework" (Figure 4-3-2-2). This suggests that if the general public were more aware of telework as a new viable work style, more people would probably want to work by telework.

Figure 4-3-2-1 Intention to use telework among employed people (by gender)

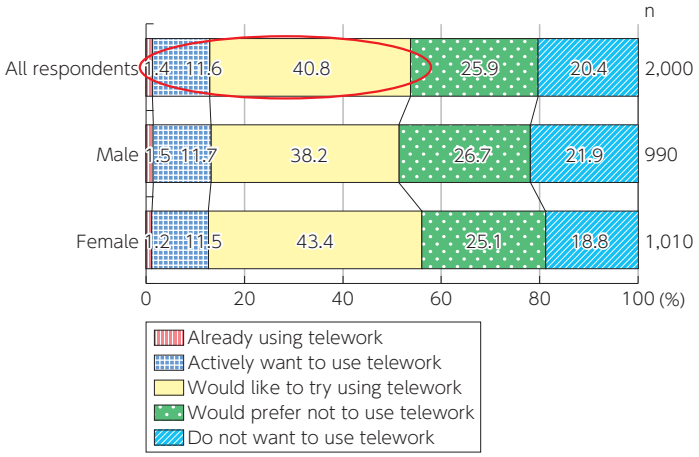
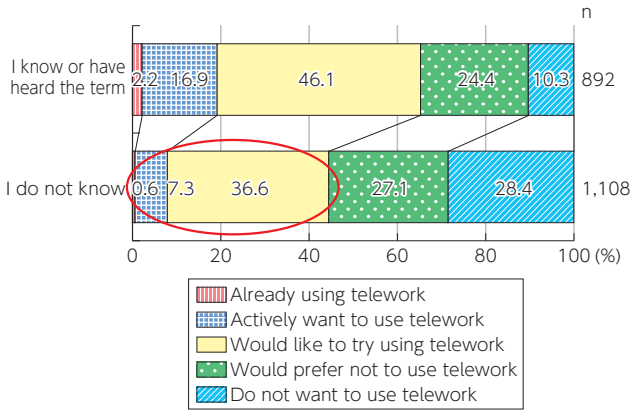


Figure 4-3-2-2 Intention to use telework among employed people (by previous awareness of telework)



(Source) "Study Report on People's Attitudes toward New ICT Services and Technologies that Resolve Social Issues," MIC (2015)

Section 4 ICT and the Olympic and Paralympic Games

The 2020 Tokyo Olympic and Paralympic Games (2020 Tokyo Games) to be held in five years time are expected to be a powerful trigger for social transformations driven by ICT. This section provides a general overview of the potential of ICT use and application at the 2020 Tokyo Games.

1. Looking ahead to the 2020 Tokyo Games

The 2020 Tokyo Games are a momentous opportunity to realize sustained economic growth for Japan in 2020 and beyond as well as a valuable venue to showcase our cutting-edge ICT to the countries of the world. To this

end, MIC held the "Conference on the Advancement of ICT utilization for the whole society towards 2010" in November 2014. The conference is studying an industry-academic-government action plan to promote the adoption of ICT throughout society, with a focus on sustained economic growth in Japan after the 2020 Tokyo Games, in cooperation with related organizations and related government ministries and agencies (Figure 4-4-1-1).

One technology expected to be used at the 2020 Tokyo Games is 4K and 8K video technology, which offers far greater resolution than current high-definition video. According to the New 4K / 8K Promotion Roadmap, released by MIC in September 2014, trial 4K / 8K broadcasts will begin on broadcasting satellites (BS) in 2016 and practical broadcasts will begin as early as possible before 2018 on BS and other television delivery systems. The end goal is to foster conditions to popularize 4K / 8K technology and enable many viewers to watch 4K / 8K programs on commercially available television sets by the time the 2020 Tokyo Games are held (Figure 4-4-1-2).

Figure 4-4-1-1 Organizational structure of the Conference

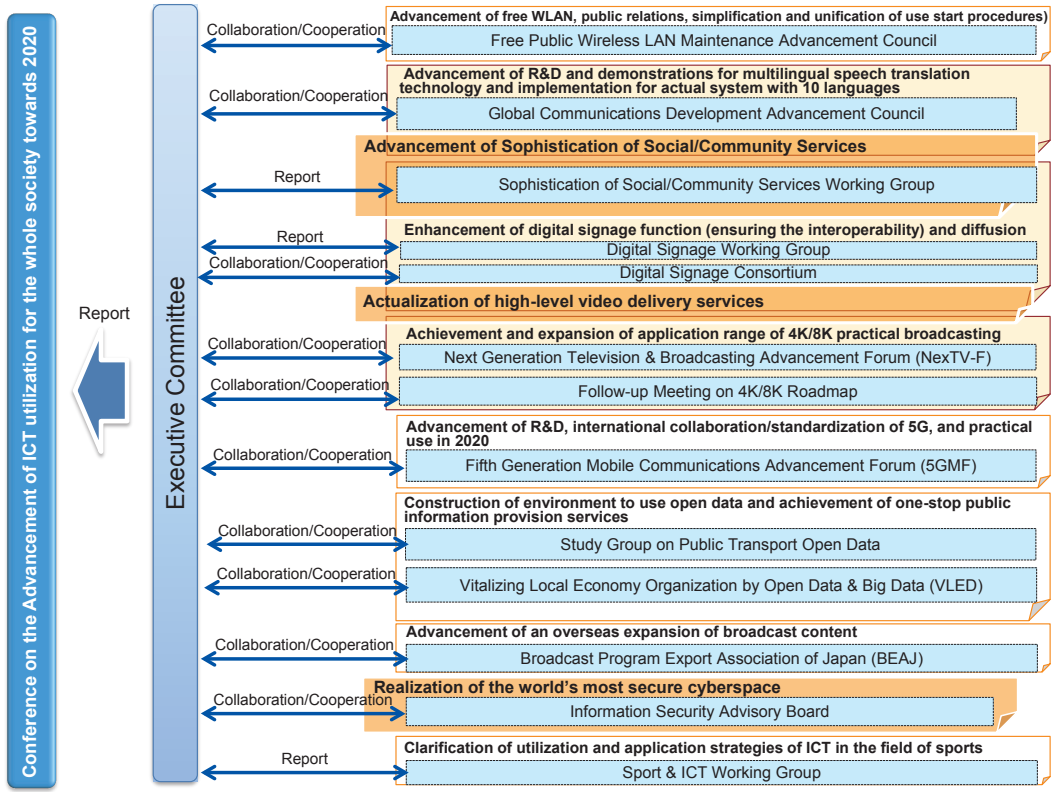
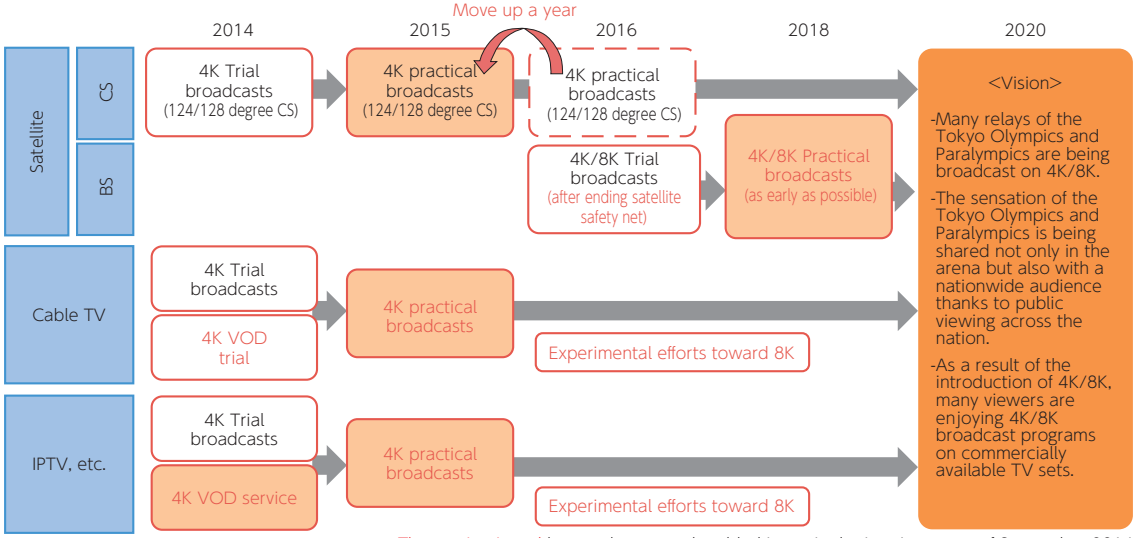


Figure 4-4-1-2 New 4K / 8K promotion roadmap



※The portion in red letters shows newly added items in the interim report of September 2014.

(Source) Prepared based on the "Interim Report of the Follow-up Meetings on the 4K / 8K Roadmap" (September 2014)