MIC International Policy Division, Global ICT Strategy Bureau

Communications News

Vol. 20 No. 4
June 5, 2009

Biweekly Newsletter of the Ministry of Internal Affairs and Communications (MIC), Japan

ISSN 1349-7987

TOPICS

Outline of Survey Concerning Factors for Deciding on Internet Usage and the Actual State of Usage

Introduction

In recent years, there has been a noticeable increase in Internet traffic in Japan, and the percentage of users has continued to increase. As of November 2008, the total volume of traffic download by Japan's broadband users was estimated at approximately at an average of 990 Gbps, showing an increase of 21.6% year on year. In addition, the penetration of the Internet in Japan stood at 75.3% of the population as of the end of 2008 (according to the 2008 communications usage trend survey). As shown through this data, Internet usage within Japan's daily life is well on its way to becoming generalized. In response to this increase in Internet usage ratios, various application services have become available, and there has been progress in the diversification of usage terminals, starting with mobile phones.

In such circumstances, for many users, Internet usage is no longer considered as something with advantages that bring particular benefits. In addition, the configurations for using the Internet have become more complicated and sophisticated so that the fundamentals of usage by people, in particular standards for making of decisions on which service to select and expectations of benefits, are difficult to grasp from the outside. On the other hand, it is also an undeniable fact that there still exists a layer that does not use the Internet.

Right from the start, it has been a difficult topic to try to quantify the contribution of informatization to productivity and the economy, and, due to the complexity in usage goals and usage circumstances, it can be said to be among the most difficult media for which to grasp quantitatively the contribution of the Internet to Japan's economy, society and living environment. It is also difficult to show clearly the inconveniences suffered from the people who are still not using the Internet, and it is hard to grasp why it is that non-users are still not using the Internet. Consequently, carrying out a multi-faceted analysis of the various elements that lead people to actual Internet usage, as well as grasping their usage trends and their expectations and evaluation of actual usage can be considered profitable in selecting the findings and discussion points that will contribute to investigating measures with a view to determining and solving problem points in the ubiquitous society.

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MIC's Institute for Information and Communications Policy (IICP) based itself on these perspectives in order to grasp through surveys and the like the actual state of Internet usage as well as the state of psychological elements, economic elements and social elements that are related to that usage. In order to analyze the mutual relationships between these elements, it then implemented a survey concerning factors for deciding on Internet usage and the actual state of usage, compiled the results in March 2009 (Note 1) which it then announced. This document is a commentary on the outline of these survey findings.

Findings of the analysis of reasons for deciding on usage or non-usage of the Internet

This survey started out, in the period from March 1 to March 20, 2007 with a mailed questionnaire sent out to men and women aged 18 and over in Japan, including those not using the Internet, asking them the state of their Internet usage, what services and applications they used on the Internet, their evaluation of the Internet, and to those people who did not use the Internet, the reasons for this and their interest levels, in order to calculate the various elements that came into play in using or not using the Internet. There were 1,232 valid replies (including 187 non-users), giving a response rate of 88%. When, based on these responses, and on defining set evaluation criteria, the various elements were broken down using a model that explained information system usage trends (Note 2), it became clear that, in putting together a formulation of intentions for using the Internet, both an awareness of the advantages from usage and self-motivation played major roles.

Taking this into consideration, a further search relating to the decisive elements for usage or non-usage of the Internet was carried out using discriminant analysis which is a type of multivariate data analysis method, which yielded that the respondents' self-efficacy (Note 3), age and interests were all strong variables in influencing usage or non-usage of the Internet. In addition, when the explanatory variables were analyzed after being narrowed down to just self-efficacy, a canonical discriminant function with high plausibility for discriminating between Internet users and non-users was obtained. From that point, it became clear that, in looking at the elements for deciding to use the Internet in contemporary Japan, elements relating to how the Internet itself is perceived and evaluated such as usability, the level of perception of ease of use, social elements and the like, had a lesser impact than a positive personal attitude as to whether they felt they would be able to make full use of a new piece of electronic equipment.

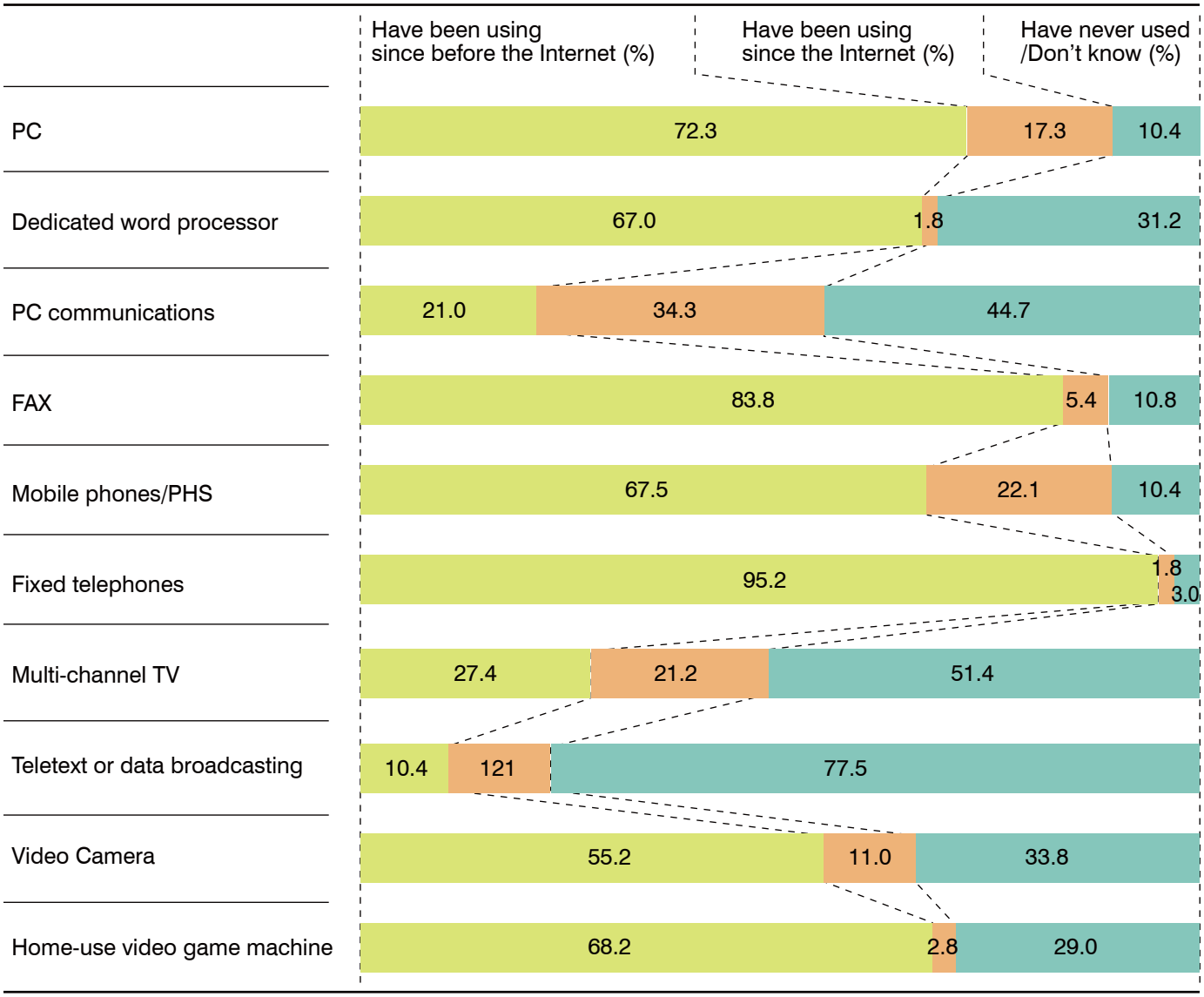
In concrete terms, the approach towards whether one might be good or not at using a new piece of electronic equipment, and whether one could or could not use it actively is what creates a gap between Internet users and non-users (Table 1). It seems that this is proof that many users approach the use of a new piece of electronic equipment with the same mindset as the use of the Internet. However, the current status of Internet users accounting for a more than 70% penetration of the population would indicate that there are users with varying perceptions, and it is quite possible that explaining usage reasons solely through perception towards electronic equipment (self-efficacy) may not be sufficient.

On the other hand, for non-users of the Internet, the Internet is perceived as being as difficult or more difficult to use than other electronic equipment (please refer to Figure 1 for state of usage), and it is likely that their feeling that they are bad at using electronic equipment and their negative attitude is closely tied in to their reasons for not using the Internet. In short, there are various reasons why people who are still not using the Internet are not using it, it looks like the element that is most affecting their behavior is their own individual negativism and lack of self-confidence when it comes to using electronic equipment.

Table 1: Trends in Internet users and non-users based on discriminant function (Self-efficacy in the face of new electronic products)

	Influence ranking	Non-users	Users	Result of chi-square test with reference to cross-tabulation
		Percentage in agreement		
I am not good at using new electronic products	1	66.9%	26.8%	p<.001
Even if I can't see how long it's going to take me to be able to use them, I am the kind who perseveres	2	11.4%	42.5%	p<.001
With regard to whether I can make proper use of electronic products or not, I tend to worry more than most people	3	47.6%	18.5%	p<.001
There are things I know better than my friends when it comes to using new electronic products	4	12.5%	29.9%	p<.001

Figure 1: State of usage of various electronic equipment



Analysis of Internet non-users

Taking the above into consideration, more in-depth research was conducted concerning the reasons why non-users do not use the Internet. In looking for reasons, the research survey mentioned earlier proposed 11 possible reasons for non-use of the Internet, limited to non-users, with multiple selections possible. The results can be seen in Figure 2.

When factor analysis concerning the reasons why not using the Internet was carried out based on the above response conditions, three factors emerged. It was possible from the factor scores to divide non-users of the Internet broadly into three categories, identifying a different set of reasons why each would be a non-user. The first group is the "Problem Concern" group that thinks that all of the problems that are mentioned relating to the Internet are going to affect them. The second is the "Unclear Advantage" group that has no clear perception of the advantages of using the Internet and, in not using it at present, does not perceive of any inconvenience. The third group is the "It Looks Difficult" group that thinks that PCs are complicated to use and that the various formalities are a bother. In the current survey, it was the "Unclear Advantage" group that was the most numerous at 51.7%.

When asking interest levels in the Internet and usage inclination to the three groups above, significant differences and characteristics came to the surface depending on the reasons for not using the Internet (Figure 3). First of all, the "Problem Concern" group had knowledge of basic net applications and very high usage inclination. Even though, when compared to the usage rate of actual users, inclination to use email and web browsers was quite low, their usage inclination for blogging, SNS, music and video distribution was not much different from actual users. From this, one can assume that whereas use of basic applications such as email and web browsers sees a lot of negative information circulating, there is relatively little information about such problems occurring with music or video distribution, resulting in little concern over use. In view of this, it is important to circulate to people who are not using the Internet detailed information that it is possible to use basic applications such as email, web browsers, or Internet shopping, safely and securely. In addition, with regard to various applications such as blogging and SNS communities and music and video distribution, not only emphasizing advantages and enjoyment, but providing information that, rather than just being afraid, it is a matter of taking care when using them, might tie in with promoting use.

Since the "Unclear Advantage" group does not find any inconvenience in communicating using methods other than the Internet, they have low levels of interest in Internet applications. It is a fact, however, that entertainment-related applications such as music or video distribution and online games are interesting and draw people in. Consequently, rather than considering user-friendliness to be interchangeable with advantage of use, it might be possible that appealing the fun of entertainment would encourage usage.

The "It Looks Difficult" group has a strong inclination towards basic applications such as email and web browsing. However, when it comes to media such as blogs and SNS which are consumer-generated, even though they ere interested, they show virtually no usage inclination. If you consider that the solution to the "It Looks Difficult" group's problems lies in showing them that it is easy to do convenient things, offering the concrete methods for easier email and web browsing could tie in to promoting their use.

Figure 2: Major reasons why non-users do not use the Internet (multiple selections)

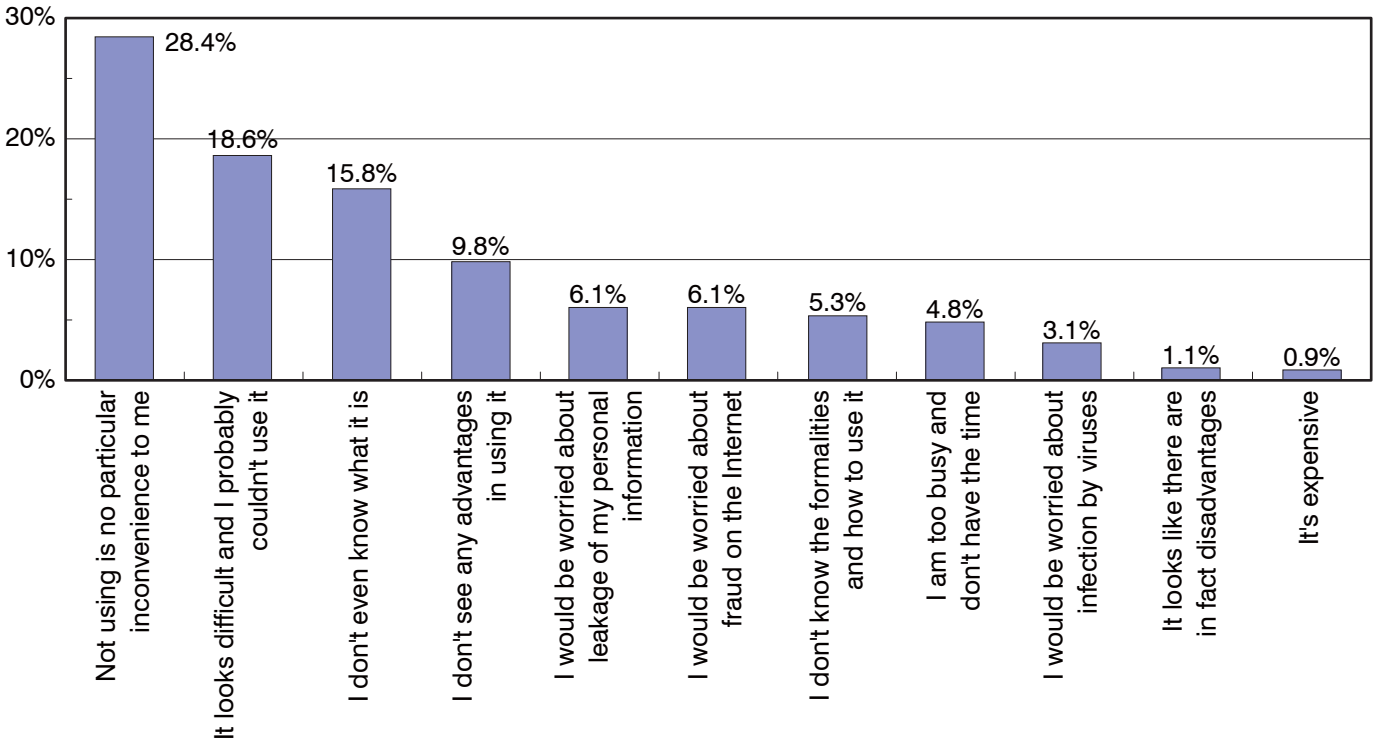
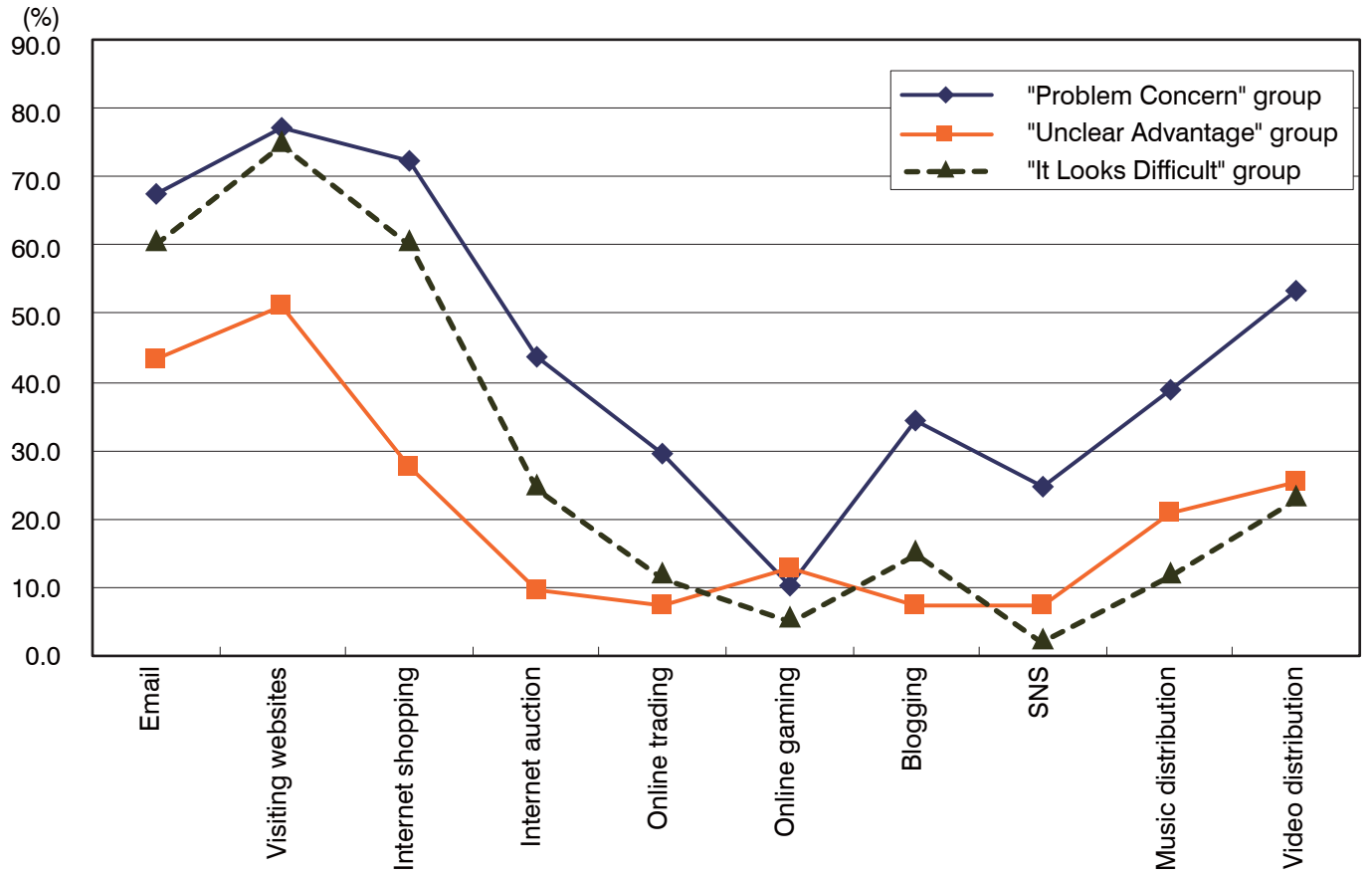


Figure 3: Percentage of "I am interested" responses by application as seen in classifying the reasons for Internet non-use



Analysis of Internet usage trends according to self-efficacy

In order to deepen the analysis of Internet usage trends according to self-efficacy, in the research survey mentioned earlier, an adaptation of topics from Yuji Sakano's "general self-efficacy scale" (Note 4) was incorporated as shown in Table 2.

Once the responses relating to the above topics were tabulated and self-efficacy scale scores calculated, the distribution obtained was very close to normal distribution. Also, in terms of self-efficacy scale scores, the trend was for the scores to be lower as people got older, and for them to be higher for men than women (Figures 4 and 5). Also, the more people had experience of using electronic equipment, the trend was for their self-efficacy scale scores to be higher and there was even a significant difference between Internet users and non-users (Figure 6). It became clear from this that non-users of the Internet have low self-efficacy scales when it comes to using electronic equipment. This is to say that these non-users of the Internet include those with no self-confidence when it comes to using electronic equipment, those who are nervous about not being able to use it properly, and those who have the perception that they are not good at it.

Table 2: Topics to find out self-efficacy scale relating to electronic equipment

Self-efficacy scale from Sakano	Topics created for use at this time
1. I am the kind of person who is confident when I set out to do a job	I am the kind of person who is confident when using a new piece of electronic equipment for the first time
2. I often feel depressed when I think of my past failures or bad experiences	It's often the case that when I have had a bad experience using something in the past, I can't be positive about it
3. I am more talented than my friends	I am better than most people when it comes to learning how to use a new piece of electronic equipment
4. When I have finished a job, I often feel that I did it badly	I often feel that I have made a mistake when I buy a new piece of electronic equipment
5. I tend to worry more than most people	I tend to worry more than most people as to whether I will be able to use a new piece of electronic equipment or not
6. When I am making a decision, I do it quickly, without hesitating	When I am considering the purchase of a new piece of electronic equipment, I make my decision without much hesitation
7. When I do something I often feel anxious that it is not going to go well	I often feel anxious that I will not b able to use a new piece of electronic equipment properly
8. I see myself as being shy	I am hesitant about new electronic equipment
9. I have a better memory than most people	I tend to learn how to use electronic equipment faster than most people
10. I think I am the kind of person who will be proactive in doing a job even if I don't have a clear idea of the results	I am the kind of person who is interested in everything I tackle
11. I often find myself unable to get into my work since I can't decide what I need to do	When I buy a new piece of electronic equipment, I often don't know what to do and feel at a loss
12. There are fields in which I am considerably more knowledgeable than my friends	I tend to know about new electronic equipment better than my friends
13. Whatever I am doing, I tend to be positive about it	Even if I can't see clearly when I am going to be able to use something properly, I remain committed to using it
14. I worry more than most people even about a small failure	If I can't use a piece of equipment, I worry about it more than most people
15. I am not good at being proactive in the way I do things	I am not good at using new electronic equipment
16. I think I can make a contribution to the world	I think I could probably teach people how to use new electronic equipment

Figure 4: Average value of self-efficacy scale scores with regard to electronic equipment by age group

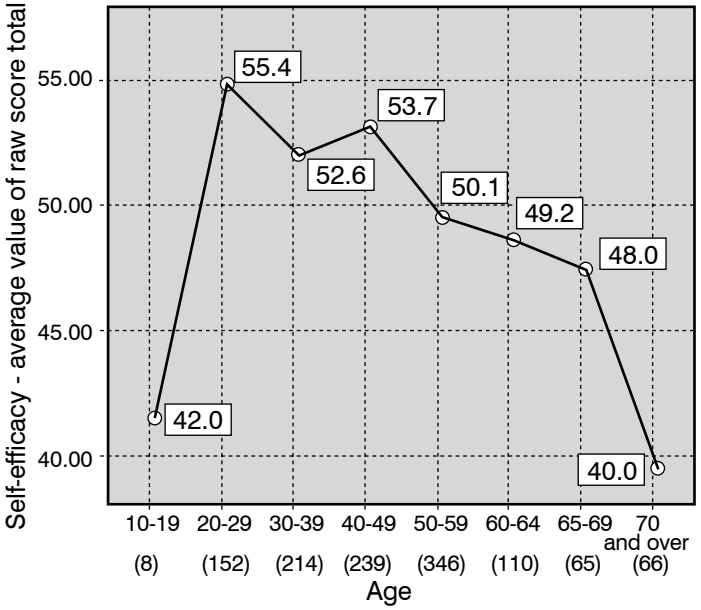


Figure 5: Average value of self-efficacy scale scores with regard to electronic equipment by gender

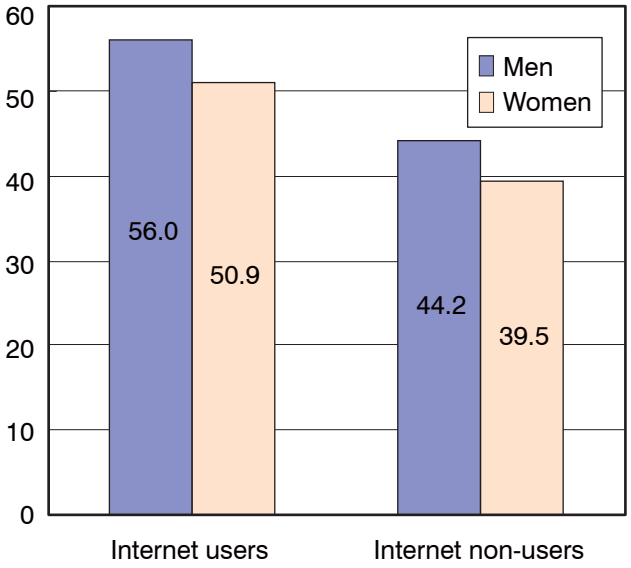
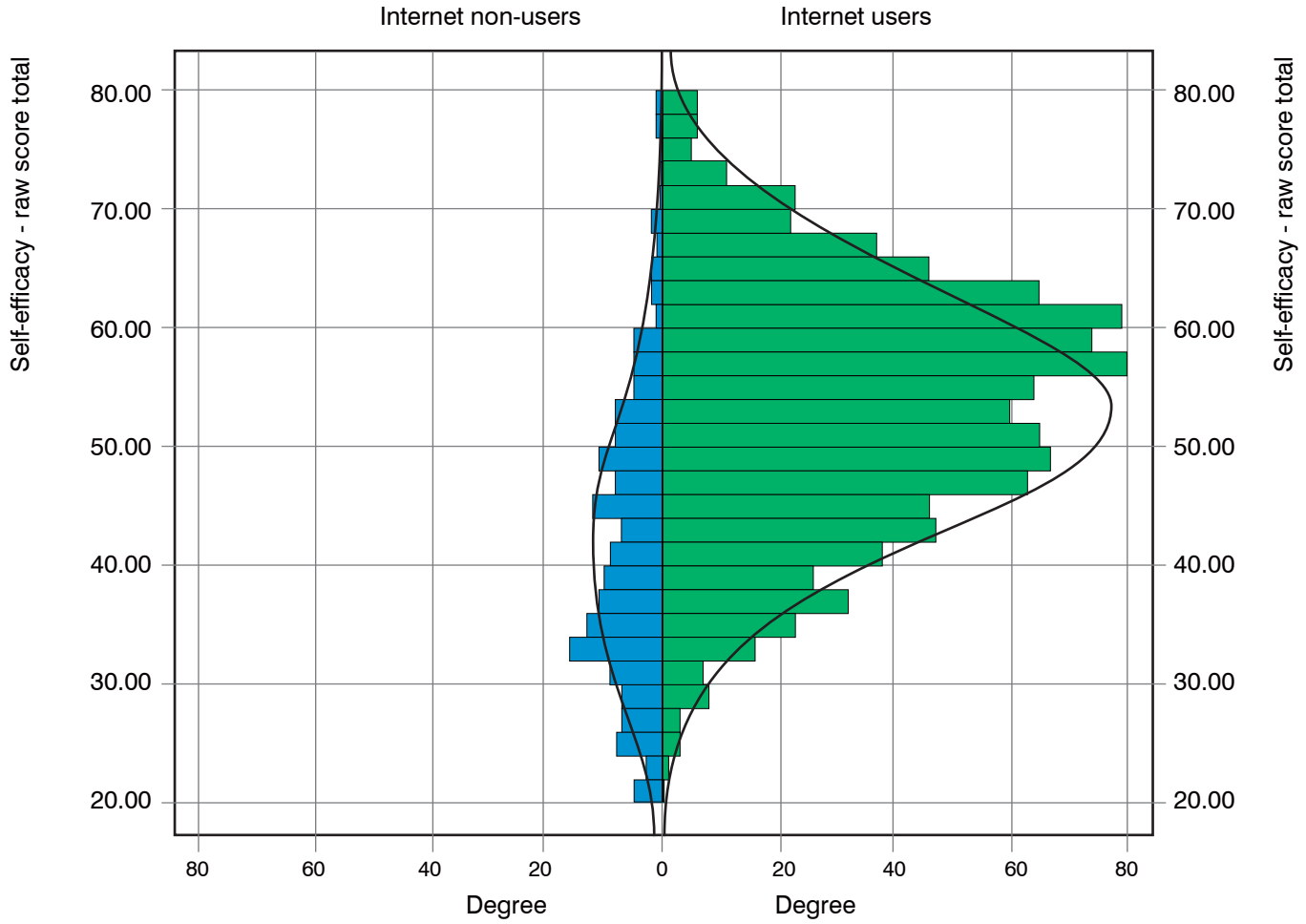


Figure 6: Distribution of self-efficacy scale scores by Internet users and non-users



The self-efficacy scales are an indicator of individual positiveness and approach attitude that differ from aptitude, skills, and literacy relating to use of the Internet and media. Since Japan's Internet penetration rates are extremely high, it can be assumed that, rather than reasons such as literacy, the people who are currently not using the Internet do so due to their approach attitude.

On the other hand, self-efficacy also impacts frequency of use among the Internet users, and it has become clear that people with high self-efficacy use Internet applications often (Figures 7 and 8). It can be said that this also shows that making full use of the Internet is closely linked to the individual's positive approach attitude. Consequently, one can conclude that experience in using various media closely ties in to self-efficacy and has a promotional aspect in using the Internet. That is to say that, even where the experience lies in using media equipment that is unrelated to the Internet, this is related to self-confidence in using new electronic equipment, and can be said to tie in with full use of the Internet and high-level applications.

Taking the above into consideration, it can be assumed that, in order to plan for an increase usage of the Internet, measures to promote usage through an improvement in self-efficacy would be efficient. For example, it is said that elderly people have recently become very interested in digital cameras. In that kind of case, a method by which self-efficacy towards electronic equipment would be heightened by starting with the use of digital cameras, leading to Internet usage, might be an efficient method for promoting usage among people who are currently non-users.

Also, research about self-efficacy relating to the latest electronic equipment verifies that the actual self-efficacy can vary greatly according to the level of interest and admiration towards the product. This means that where individual interest is strong, self-efficacy will be heightened, bringing with it a feeling of "I'll make an effort to try using it" which makes it likely that encouraging autonomous use by making people interested and helping them understand the advantages of the Internet, would be an efficient measure to promote use in Japan which already has a high level of Internet penetration.

Figure 7: Average value of self-efficacy scale scores for Internet users by usage frequency at home

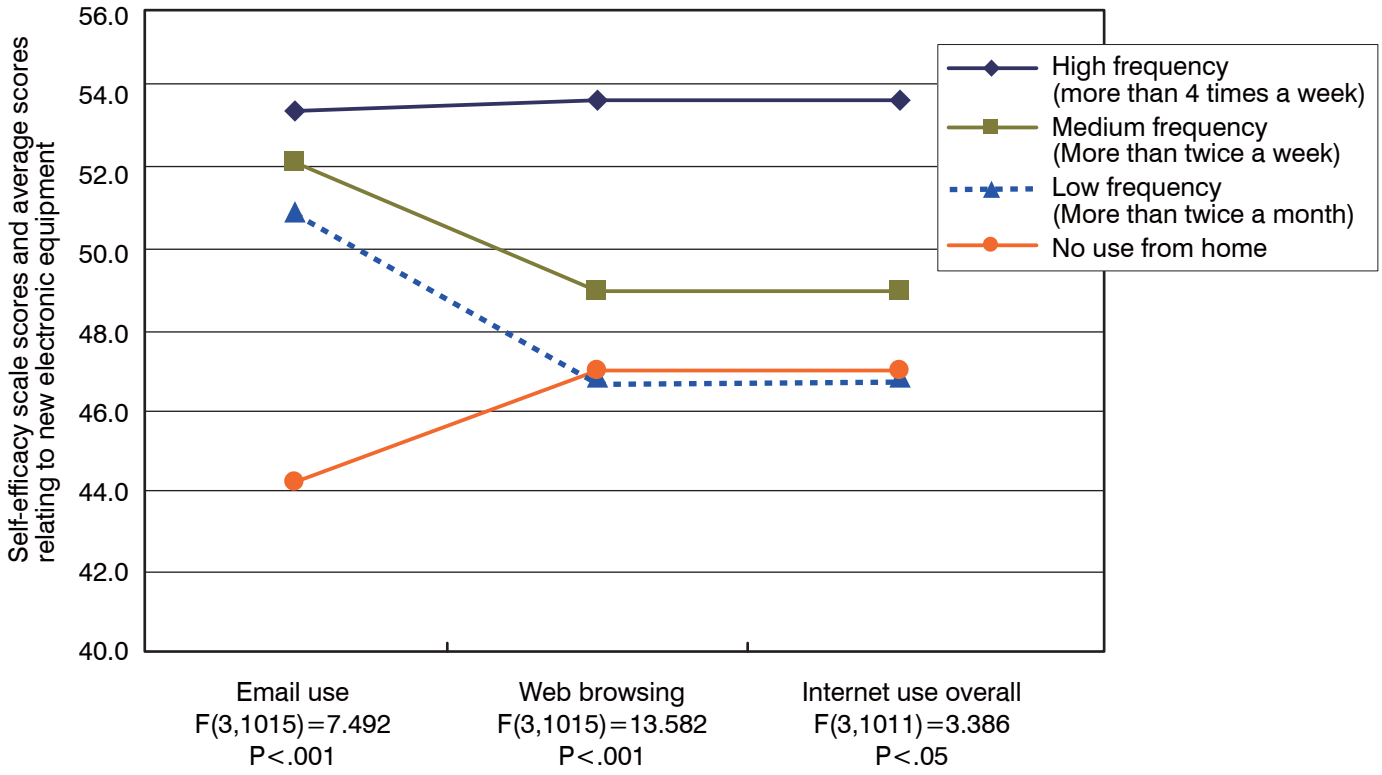
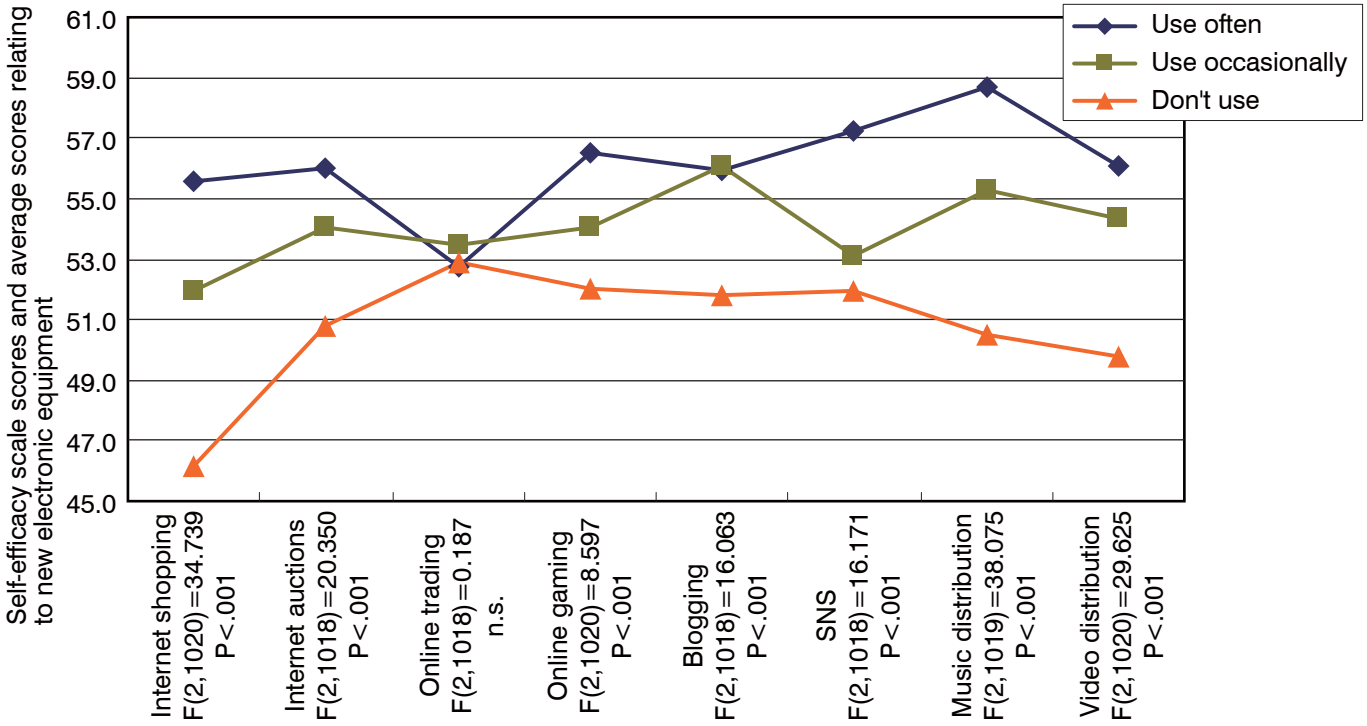


Figure 8: Average value of self-efficacy scale scores for Internet users by used applications



Summary

When analyzing the reasons for deciding to use the Internet, it became clear that individual autonomy and in particular attitude towards using new electronic equipment are major influences, and that the feeling that they're "not good at it" is a reason why they don't use it. With regard to users who have low levels of self-efficacy towards electronic equipment in general, and the Internet in particular, the ratio of Internet use is low whereas users with high levels of self-efficacy tend to make frequent use of Internet applications. Consequently, it is desirable to put priority on increasing self-efficacy as a way to promote use of the Internet.

It is a fact that non-users of the Internet can be broadly divided into the three categories of the "Problem Concern" group, the "Unclear Advantage" group and the "It Looks Difficult" group, and there is a need to devise measures for promoting use that are in line with the characteristics of each group. For example, it would be important to provide information to use the Internet safely and securely to the "Problem Concern" group.

With the advances of broadband within communications networks, the seeding up of the Internet, and the resulting greater complexity in use, it is conceivable that the gap in self-efficacy between Internet users and non-users will widen further. This will probably expose the negative aspects associated with non-usage of the Internet such as the inconvenience, gap in information and the digital divide between individuals. It would therefore not be an exaggeration to say that devising measures for appropriate future use is an urgent task.

Note 1: The entire text of this research study can be found (in Japanese only) at: http://www.soumu.go.jp/iicp/chousakenkyu/data/research/survey/telecom/2009/2009-01.pdf

Note 2: This research study uses as a basic model TAM2 which is an enhanced version of TAM (Technology Acceptance Model), from the perspective of considering elements relating to users such as users' experience and spontaneity, and societal factors. Further details concerning TAM2 can be obtained in "A theoretical extension of the technology acceptance model: Four longitudinal field studies" by V. Venkatesh and Davis, F.D. (2000), Management Science, (46:2), pp. 186-204.

Note 3: Self-efficacy is the expectation of how well one would tackle an action with a specific goal, and something like the self-confidence that comes from being aware that one has these expectations. "The relationship between self-efficacy, causal attribution and learning strategies in achieving learning goals" by Takamichi Ito (1996), Educational Psychology Research, 44, pp. 340-349.

Note 4: "Approaches to creating general self-efficacy scales" by Yuji Sakano et al. (1986), Japanese Journal of Behavior Therapy, 12 (1), pp. 73-81.