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## Demand analysis for time-shifted viewing in the Japanese TV market

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# Demand Analysis for Time-Shifted Viewing in the Japanese TV Market

In this study, we analyze the Japanese TV audience's preference for time-shifted viewing (TSV), which was introduced in the media market October 2015. This service has various characteristics such as a simple fee-charging video-providing service through the Internet, by which network broadcasters provide the same TV programs as on air live, without charge, and during a given time, thus relaxing time constraints. TSV is also different from a traditional terrestrial broadcasting service in the sense that TSV facilitates information exchange between the audience and the broadcasters. A similar service is already being offered in several countries including the UK, and the total usage time has increased.

We empirically analyze the factors affecting an audience's TSV behavior, using the stated preference method, by studying four basic attributes: receiving equipment, existence/non-existence of commercials, necessity of registering personal information, and weeks available for viewing programs. Using conjoint analysis based on the data collected in April, 2015, we show that the coefficients of attributes for the last three attributes are all significant, which implies that the percentage of people using the TSV service would be affected by these attributes. We also find that about 20% of the viewers are willing to pay 67 yen (0.56 USD), on average, for skipping commercials. This can be considered a relatively high value, because the TV-viewing audience in Japan can enjoy most TV programs without charge.

(*JEL* Classifications: L82, L96)

## 1. Introduction

In this study, we analyze the Japanese TV audience's preference for time-shifted viewing (TSV), which has been introduced on a trial basis in the media market October 2015.. Five key primary terrestrial commercial broadcasting stations in Tokyo now provide on-air TV programs on an on-demand basis without charge. Audiences can watch missed TV programs, which are aired predominantly during prime time (19:00–23:00), for about one week using the Internet, on their PCs, tablets, and smartphones. Commercials, which are quite important and almost the only financial source for terrestrial broadcasting stations, are inserted along with the on-air programs and cannot be skipped. Dramas and variety programs constitute the primary content supplied.

A similar service is already being offered in the UK, France, Germany, and the US. We regard the TSV service as one that provides the same goods (programs) with different timings through different means of distribution. Then, the increase in TV-watching time is simply due to the following two factors of increase and one factor of decrease:

Factors of increase: (i) viewers who shifted from a digital video recorder (DVR) to TSV, and  
(ii) positive external effects including word-of-mouth communication  
caused by expansion of exposure.

Factor of decrease: decrease of necessity for live viewing.

Japanese terrestrial commercial broadcasting stations presently have about a 60% share of the broadcasting market<sup>1</sup>, but it was recently pointed out that viewers tend to avoid watching TV programs because of factors such as media diversification and dissemination of other ICT devices<sup>2</sup>, just as in other countries. Earlier, these broadcasting stations showed a lack of initiative to offer the TSV service because they were afraid that TSV would decrease live viewing. However, they finally decided to offer it because they recognized that DVR is a threat and that TSV has been successful in other countries. Although revenue from TSV advertising will be lesser than that from live broadcasting, which is based on current “reach,” offering the TSV service is a favorable strategy for broadcasting stations to receive advertising revenue, considering that the revenue from DVR is negligible. In addition, the characteristics of TSV differ from that of traditional terrestrial broadcasting services in that TSV facilitates information exchange between the audience and the broadcasters.

The remainder of this paper is structured as follows. We survey previous research in Section 2, while elaborating on the actual TSV usage conditions in six countries, including Japan, in Section 3.

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<sup>1</sup> Ministry of Internal Affairs and Communications (2015).

<sup>2</sup> The NHK Broadcasting Culture Research Institute ed. (2011).

We present our questionnaire survey design and estimation results in Section 4 and examine the value of disutility of commercials in Section 5. We summarize our results and present tentative conclusions in Section 6.

## **2. Literature Review**

Although many previous studies examine the relationship between Internet usage and television-viewing behavior, we introduce only a few of the recent studies here.

Liebowitz and Zentner (2012) regarded television viewing to be the leading American recreation activity and examined the impact of the Internet on this activity. They ran a panel regression using data on television viewing, Internet penetration, and socioeconomic factors for a large number of American cities starting before the birth of the Web. They found that the Internet's effect on television viewing varies by age group, reducing such viewing by a moderate amount for the youngest Americans but having no impact on the viewing habits of the oldest Americans. Based on these results, they hypothesized that the overall impact of the Internet on television viewing is likely to increase over time as older age groups gain more experience in using the Internet's recreational opportunities.

Banerjee et al. (2013) focused on the fact that traditional sources of television programming (or "pay TV") are facing rising competition from bypass or over-the-top (OTT) alternatives in the form of streamed or downloaded access to video content. They classified consumers of video content into three categories: (i) "cord loyalists," who continue to use pay TV exclusively, (ii) "non-pay TV" consumers, including those who have cut the video cord, that is, they have entirely dropped pay TV in favor of OTT, and (iii) "cord couplers," who use both pay TV and OTT. Using a longitudinal survey panel of 7,655 unique households observed over three consecutive quarters in 2011 and relative risk ratios from multinomial choice models estimated using the data, they examined whether (1) households transition among the three OTT segments over time, and (2) the factors that determine the household's decision to remain in, or move from, an OTT segment. They concluded that connected devices (both their use and their variety) and certain key demographics (age, annual household income, and race/ethnicity) influence household choice of the OTT segment.

Waldfogel (2009) conducted his research from an aspect similar to that in our study. Network broadcasters feared that the availability of their clips on channels such as YouTube would depress television viewing, but his hypothesis was that unauthorized clips were also free advertising for television shows. He examined the effects of authorized and unauthorized Web distribution on television viewing between 2005 and 2007, using a survey of UPENN's students on their tendency to watch a television series on the television as well as on the Web. While he found some evidence of

substitution of conventional television viewing with Web viewing, he also found that the time spent on viewing programming on the Web—6.8 hours per week—far exceeded the reduction in traditional weekly television viewing of about 7 minutes per week. He also reported that the overall time spent on network-controlled viewing (television plus network websites) increased by 3.7 hours per week.

With respect to commercials, most previous studies agree that the audience experiences disutility owing to interruptions by commercials. On the other hand, Nelson et al. (2009) pointed out that commercial interruptions can actually improve the television-viewing experience. Although consumers do not foresee it, their enjoyment diminishes over time. Commercial interruptions can disrupt this adaptation process and restore the intensity of such enjoyment.

Koguchi et al. (2015) investigated services for watching videos, which are typically offered on the Internet, and clarified the economic value of personal data in the form of the compensation amount to be paid for the leak of this data through the use of such video services. They found major differences in the willingness to pay (WTP) and the willingness to accept in relation to such leaks. The former was from 3,000 yen (25 USD) to 4,000 yen (33.3 USD), and the latter, 13,000 yen (108.3 USD) to 15,000 yen (125 USD) per person<sup>3</sup>. Moreover, even when the respondents' viewing history consisted of the same videos, the large difference in their WTP and their willingness to accept for YouTube and adult videos showed that these results are likely to differ according to consumer attributes.

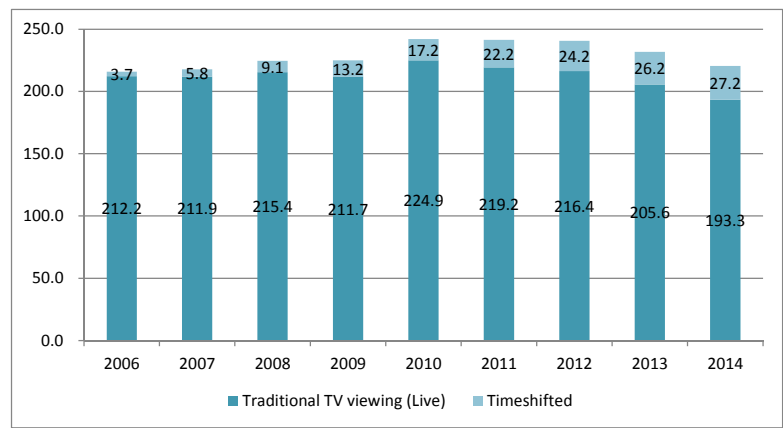
Some researchers have pointed out that TSV prevents the illegal distribution of TV programs. Uchiyama (2015) expected that TSV would contribute as an effective method of decreasing illegal leakage of TV programs to the Internet, presenting an example that the most effective and efficient way of preventing illegal copying of a DVD is its early release.

In the UK, TSV was introduced in 2006. TSV usage was just about 3 minutes (2%) of the average daily minutes viewed per individual in 2006, the first year it was launched. However, in the seven years since then, the usage has increased and was about 27 minutes (12%) in 2014 (Figure 1). We expect that TSV would contribute to the increase in TV-watching time in Japan although we have recently observed a trend away from television.

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<sup>3</sup> We used exchange rate 1 USD = approximately 120 yen in September 2015.

**Fig. 1: Average Minutes of Total TV Viewing per Day (in the UK)**



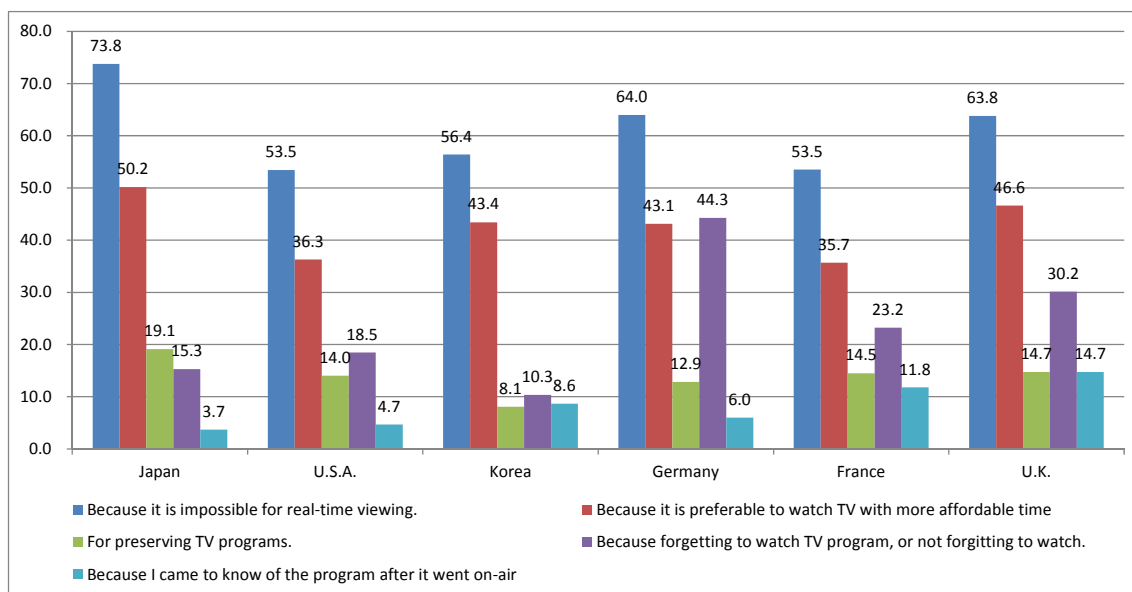
Source: Ofcom (2015)

### 3. The TV Viewing Environment in Japan Compared to that in Other Countries

Here, we overview the actual usage of services similar to TSV in various countries, as it would be helpful to evaluate future TV-viewing behavior, including TSV, in Japan. We show two primary survey results based on the “Common survey on actual viewing behavior for TV programs and video content through the Internet in six advanced countries<sup>4</sup>,” reported by the Japan Commercial Broadcasters Association (JBA, 2015).

Figure 2 depicts the answer to the question, “the reason for using video players or time-shifted viewing.” We can see that a high percentage of users chose the option “because real-time viewing is impossible” followed by “because it is preferable to watch TV when I have more time” in most countries. Therefore, we can conclude that relaxing the time constraint is the primary factor leading to the demand for a TSV service. Focusing on the Japanese responses, because “for preserving TV programs” is the highest in Japan, at 19.1%, we can expect that video recording or DVD sales would still see high demand even after the introduction of the TSV service. Note that at 3.7%, “because I came to know of the program after it went on-air” is the lowest in Japan among the six countries. However, we should note that this survey was conducted in February 2015, when all broadcasting stations in Japan had only just provided trial TSV services. It would be possible to stimulate the potential demand for TV viewing after it becomes widely recognized and established, just as it has in the UK, as illustrated in Figure 1.

**Fig. 2: Reasons for Using Video Players or Time-Shifted Viewing (Multiple Answers)**

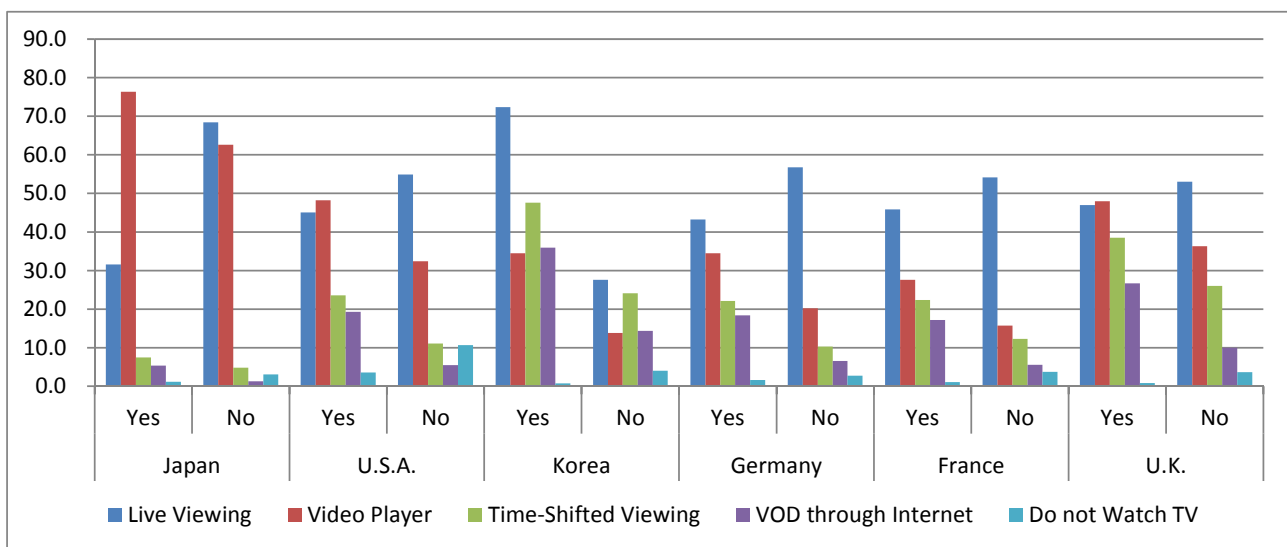


Source: JBA (2015)

<sup>4</sup> This survey was implemented through the Internet, targeting 6,215 males and females, aged 15–70, residing in six countries—Japan, the US, Korea, Germany, France, and the UK—from February 25 to March 17, 2015.

Figure 3 reveals the answer to the question, “What are the means of watching TV with/without an Internet connection?” As reported by JBA (2015), an “audience with Internet-connected TV shows quite high percentage of using TSV or VOD (Video on Demand) service.” Therefore, it is possible to increase the demand for TSV services<sup>5</sup>, as Internet-connected TV is going to increase in the near future in Japan—although it is presently the lowest, at 31.6%, among six countries<sup>6</sup>. Of course, we should be cautious about making a categorical decision because it is not clear how enriched pay TV programs or video content distributed through the Internet are.

**Fig. 3: Means of Watching TV With/Without an Internet Connection**



Note: “Yes” means “Internet-connected”; “No” means “No connection.”

Source: JBA (2015)

<sup>5</sup> The introduction of TSV may work to increase the connection rate of TV with the Internet in Japan.

<sup>6</sup> Countries and their corresponding TV connection rates with the Internet are as follows: Korea (72.3%), the UK (47.0%), France (45.9 %), the US (45.1%), Germany (43.2%), and Japan (31.6%).



#### 4. Empirical Analysis

We conducted a “Survey on TV and Internet usage in Japan”<sup>7</sup> to obtain a picture of the potential demand for the TSV service in the Japanese media market before full-scale implementation. We investigated weekday and weekend TV watching behavior; categories of frequently watched TV programs, both live and recorded; and types of frequently watched websites (e.g., YouTube, Niconico Douga, and FC2). We investigated TV-watching behavior on weekdays and weekends, categories of frequent TV-program watching demarcated as live and recorded viewing, and types of websites that allow videos to be frequently watched (e.g., YouTube, Niconico Douga, and FC2).

In this survey, we considered four attributes—(a) receiving equipment, (b) commercial, (c) personal information<sup>8</sup>, and (d) available period—and selected a few choices for each attribute, as shown in Table 1, to analyze the user’s preference for the TSV service. We did this assuming that “drama”—the most popular TSV service in many countries—is the intended category of the provided TV program. From a combination of these basic attributes, we arrived at eight alternatives using the orthogonal design method.

**Table 1: Basic Attributes and Choices**

	Choices
Receiving Equipment	(1)TV (including PC, Tablet, Smartphone), (2)TV only, (3)PC (including Tablet, Smartphone)
Commercial	(1)with CM, (2)without CM
Personal Information	(1)Need for Registration, (2)No Need for Registration,
Available Period	(1)Until 1 Week, (2)Until 4 weeks, (3) All for this series (3 months)

Table 2 shows a concrete example of a conjoint questionnaire. We designed it such that respondents could choose one of three alternatives to one question. Alternatives 1 and 2 were selected from the eight alternatives mentioned above. In addition, we added the third alternative, “do not use the TSV service,” to avoid upward bias in estimation.

<sup>7</sup> This survey was implemented by Macromill Ltd. from Tuesday, April 28 to Thursday, April 30, 2015. Respondents were selected and administered the questionnaire by employees of Macromill Ltd. and 1,264 participants were collected equally across genders and age groups. All samples were divided into four segments and were assigned different sets of questions.

<sup>8</sup> We define “Personal Information” as the combination of name, address, and e-mail address.

**Table 2: Example of a Questionnaire**

	Alternative 1	Alternative 2	Alternative 3
Receivable Equipment	PC (including Tablet, Smartphone)	TV only	No Use
Commercial	with CM	without CM	
Personal Information	Need for Registration	Need for Registration	
Available Period	All for this series (3 months)	Until 1 Week	

Because there are 28 combination patterns of alternatives 1 to 8, we asked 16 questions per respondent without specifying the clear preference order of alternative combinations. In addition, we prepared four trick questions to eliminate unfaithful respondents<sup>9</sup> and dropped respondents who gave at least one contradictory answer from the sample. As the total number of respondents was 1,264 and each respondent was asked 20 questions, the total number of observations was 25,280. After eliminating unfaithful respondents, we finally obtained 13,424 valid samples.

Estimation results using the stated preference method are shown in Table 3. Results (1) and (3) are estimated using a conditional logit (CL) model, while results (2) and (4) are estimated using a random parameters logit (RPL) model.

Looking at the four attributes, we obtained results consistent to our expectation that the percentage of those using the TSV service would increase if there were no commercials, no need for personal information registration, and a longer period of availability. We also found that users had a strong preference for TV receivers although there were few differences in the coefficients for TV receivers and PCs.

Further, we used three dummy variables to see the effect by sex, personal income, and age: MAN (1 if respondent is male), OVER (1 if personal income is over 2 million yen), AGE (1 if respondent is over 60). Judging from the interaction terms coefficient and t-values, males and an aged audience have a lower demand for the TSV service and experience a larger disutility with commercials. As for personal income, we did not find a clear effect for choice probability of the TSV service.

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<sup>9</sup> We asked a question four times such that alternatives 1 and 2 were reversed compared to when the question was asked just before.

Table 3: Estimation Results

	CL		RPL		CL		RPL	
	(1)		(2)		(3)		(4)	
<b>TV</b>	0.378 *** (0.039)		0.918 *** (0.131)		0.500 *** (0.053)		0.938 *** (0.097)	
MAN × TV					-0.192 *** (0.071)		-0.191 (0.134)	
OVER × TV					-0.059 (0.069)		-0.023 (0.118)	
AGE × TV					-0.364 *** (0.099)		-0.807 *** (0.221)	
<b>PC</b>	0.085 ** (0.042)		0.064 (0.069)		0.106 ** (0.051)		0.109 (0.076)	
MAN × PC					-0.065 (0.051)		-0.217 ** (0.097)	
OVER × PC					0.061 (0.050)		0.187 ** (0.079)	
AGE × PC					-0.452 *** (0.073)		-0.999 *** (0.173)	
<b>ADV</b>	-0.154 *** (0.034)		-0.620 *** (0.109)		-0.139 *** (0.051)		-0.494 *** (0.081)	
MAN × ADV					-0.070 (0.073)		-0.224 (0.137)	
OVER × ADV					0.065 (0.072)		0.050 (0.115)	
AGE × ADV					-0.128 (0.102)		-0.191 (0.234)	
<b>SET</b>	-1.016 *** (0.039)		-1.696 *** (0.229)		-1.123 *** (0.057)		-1.437 *** (0.095)	
MAN × SET					0.205 ** (0.081)		-0.186 (0.182)	
OVER × SET					-0.036 (0.079)		-0.487 ** (0.202)	
AGE × SET					0.332 *** (0.114)		0.398 (0.251)	
<b>TERM</b>	0.036 *** (0.003)		0.028 *** (0.007)		0.041 *** (0.004)		0.045 *** (0.074)	
MAN × TERM					0.124 (0.084)		0.140 (0.151)	
OVER × TERM					0.043 (0.078)		-0.106 (0.125)	
AGE × TERM					0.060 (0.126)		-0.054 (0.294)	
<b>C_1</b>	-0.314 *** (0.062)		-0.160 * (0.097)		-0.313 *** (0.062)		-0.209 ** (0.094)	
<b>C_2</b>	-0.922 *** (0.058)		-1.117 *** (0.096)		-0.946 *** (0.059)		-1.076 *** (0.085)	
# of samples	13424		13424		13424		13424	
Log likelihood	-13093.0		-12995.1		-12987.9		-12894.9	

Note: \*\*\*, \*\*, and \* denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

## 5. Willingness to Pay for Skipping Commercials

As shown in Table 3, the disutility of an audience forced to see commercials seems to be large. According to JBA (2015), many audiences choose “the reason for using video players or time-shifted viewing” as “skipping commercials<sup>10</sup>.” It is often pointed out that most audiences in Japan feel that “TV programs should be provided without charge in principle,” but how large is their WTP to eliminate disutility? To investigate this, we asked the question, “How much would you consider paying for skipping commercials per program at one time while using the TSV service?”

Thus, although over 80% respondents answered that their “WTP is zero” for skipping commercials, another 238 respondents (about 18.8%) answered that they would like to skip commercials. Their average WTP value was about 67 yen (56 cents). We may say that this value is relatively high, considering the current standard price for viewing TV dramas per episode is 200–300 yen (US\$1.6–2.5) in Japan.

## 6. Conclusion

In this study, we analyze the Japanese TV audience’s preference for TSV, which was introduced on a trial basis in the media market this fall. Our estimation results show that the coefficients of attributes for with/without commercials, with/without registering personal information, and the weeks available for viewing programs are all significant, and hence, we can conclude that the percentage of those using the TSV service would be affected by these attributes. We also find that about 20% of the viewers have a relatively high WTP value for skipping commercials, considering that they can enjoy most TV programs without charge.

As Liebowitz and Zentner (2012) state, the Internet has been depicted as an enemy of the leading recreation activity, TV, in many cases. However, the TSV service is complementary to TV programs as it allows customers to change transmission methods and relaxes time constraints. If so, we can conclude that the quality of content would decide the ultimate winner in the video market after all. We can also say that the TSV service would work as a countermeasure to prevent distribution of pirated content because this service has been quite popular in many countries in which it has been introduced. On the other hand, audience disutility would not be small, because the TSV service has commercials, including on the Web, which cannot be skipped in many countries. Further, TSV users have strong feelings of resistance to registering personal information even in the case of TV dramas

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<sup>10</sup> The percentage of people choosing “skipping commercials” as a reason for using video players or TSV is 35.0% in the UK, 34.5% in the US, 27.7% in Germany, 21.6% in Japan, 18.5 % in France, and 8.1% in Korea. The percentage of people who answered, “I always skip commercials while watching TV programs using video players” is quite high in the UK and Japan compared to other countries in the same survey.

generally provided by terrestrial broadcasting stations. Therefore, it is necessary that broadcasters operate their TSV services on the Web considering the various guidelines for treating personal information published by FTC, OECD, and the EU<sup>11</sup>.

#### 【Acknowledgment】

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<sup>11</sup> Please refer to FTC's 2000 version of Fair Information Practices, a Data Protection Directive by the EU.