# An Analysis of the Service Ecosystem of the Japanese Pay-Television Industry from the Perspective of Service Dominant Logic

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*Abstract*—**The purpose of this paper is to analyze the circumstances surrounding pay-TV industry in Japan. According to SDL (Service Dominant Logic) theory, the paper considers the industry as a service ecosystem that is a self-adjusting system of components connected by service exchange. The study analyzes and illustrates the ecosystem using information from audience measurements by TV viewing meter and survey, media marketing research, economic statistics, observation of marketing activities and interviews with businesspersons in the industry. This paper argues that it is meaningful to consider the situations surrounding the pay-tv industry as a service ecosystem that consists of various components such as platforms, cables, satellites, channels, productions, TV sets, set top boxes, and family viewers. This consideration has to lead to a better understanding of the situation where each component is mutually nested. The paper concludes that although competitive video on demand services on the web are expanding gradually, the coverage rate of pay-tv remains stable in the Japanese market. The pay-tv ecosystem embraces strength to survive in the market for the moment due to attributes of audience and its prevention system against churn.**

## I. Introduction

Japanese pay-TV business began with the opening of urban cable television in 1987 and developed in the 1990s. As of June 2015, 13,560,000 households subscribe and the household penetration rate is 26.1%[1]. Penetration has remained flat since 2008, and most in and around the pay-TV industry do not expect significant growth is moving forward. They mention that reduced demand and lower awareness of the multichannel service in the market are the relevant factors[2]. In research by industry organizations as well, pay-TV is seen as a service with an aging customer base rather than one with growth potential or promise[3]. Also, the rise of paid video service over the Internet, known as OTT (over-the-top content) in the west, is thought to be a threat to pay-TV in Japan as well. In the US, where the showdown between television and OTT is already in progress, cable television is seeing the effects of cord cutting and cord shaving driven by OTT companies. That is to say, OTT delivers content to viewers via the Internet, enabling viewers to cancel existing pay-TV contracts (like cutting a cable cord) or switch from high-cost packages with many channels to lower-cost packages with fewer channels (like shaving a cable cord to make it thinner).

It is possible that the growth of the pay television industry is stagnant. However, if one focuses on only the number of subscribers and sales, then the market and the service cannot be explained sufficiently. In order to overcome such general views of the market, a holistic perspective on the overall pay-TV industry would be efficacious.

The objective of this paper is to analyze the situation surrounding the Japanese pay-TV industry. In doing so, the study will use S-D logic (service-dominant logic) to view the entire pay-TV industry as a service ecosystem. In addition to the conventional method of focusing on the contractual relationship between the seller and buyer in pay-TV, S-D logic enables analysis of the mutual relationships between the players in the entire industry, resulting in a better understanding of what is happening to pay-TV and viewers. The ecosystem is a concept from economics and management, but it originally stems from biology and zoology[4]. When applied to an economy, industry, business, or service, an ecosystem includes products, services, value creation, and the links between them. When discussing "business ecosystems," the ecosystem consists of an interconnected population of organizations, or business sectors[5]. A service ecosystem has a wider range, with consumers and customers, rather than sectors, as the actors[4] . According to Lusch and Vargo, ecosystems mesh with the S-D logic framework. Service ecosystems are 'relatively self-contained, self-adjusting systems of resource-integrating actors connected by shared institutional arrangements and mutual value creation through service exchange'[4].

S-D logic, which regards customers as co-creators of value, contradicts G-D logic (goods-dominant logic) which views companies as the creators of value. This study suggests that the unilateral provision of programs by broadcasters alone is insufficient to explain this service ecosystem. The significance of applying S-D logic to the pay-TV case is that certain marketing issues arose from a typical G-D logic and the structural features of the industry lie in Japan's pay-TV industry. In S-D logic, the experiential value is crucial. How the audience consumes TV shows and experience them are momentous. Value is co-created through the customer experience.

Also, this article analyses the pay-TV service ecosystem with the viewpoint of saturation of artifacts [20][21]. It is possible to examine continuously the state of diffusion of television sets as artifact and penetration of pay-TV. The concept of saturation of artifact will be clarifyed by comparing with other artifacts, such as cars and video cameras.

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This study will make use of S-D logic to analyze the pay-TV service ecosystem through audience measurement and survey data, media marketing research, economic statistics, observation of the pay-TV industry's marketing efforts, and interviews with businesspeople in the industry.

This article proceeds with objectives which are to (1) briefly review previous literatures on pay-TV, (2) outline the Japanese television and pay-TV industry, (3) illustrate the model of the pay-TV service ecosystem and discuss its issues in language of S-D logic and (4) explore the strengths of the ecosystem to maintain itself.

## II. Earlier studies

In previous studies of pay-TV, some researchers have focused on the value of signing a contract and paying for service. Ducey et al. studied early pay-TV in the US to explore factors accounting for a subscription to basic cable service and purchase of optional pay channel[6]. In Europe, sports programming genres were compared by country to analyze the factors in willingness to pay to view live sports programming[7]. This paper will also discuss the relationship between the most popular sport in Japan, professional baseball, and pay-TV subscriptions.

Yatsuhashi analyzed factors in the subscription decision in the early days of Japanese cable television and pointed out structural issues caused by the self-optimization efforts of cable television businesses [8]. While Yatsuhashi did not actually spell out the tangible problems, the view of the entire industry as links between pay-TV sectors has similarities to the service ecosystem concept. This study will use S-D logic to delve into this point further as a current challenge facing the service ecosystem surrounding the pay-TV industry.

In South Korea, an economic research studies the penetration of pay-TV[9]. The South Korean household penetration rate of Pay-TV was 80% in 2008, and the introduction of IPTV offerings from communications companies triggered a price war, leading to further penetration [10]. At first glance, the competitive situation for Japanese platform companies has some similarities to the Korean market, but the results in Japan are different, with pay-TV penetration rates stable at low levels. The broadcasting sector is affected by its historical, political, and economic background such as broadcasting regulations and infrastructure, as well as language and cultural background that differs in each country. Therefore, a fair international comparison requires adjustment for various conditions, which is not within the scope of this paper. Rather, this paper will focus on why Japanese pay-TV penetration is stable at low levels.

Most of the economic studies of pay-TV examine the causal link between subscriptions to pay-TV service and price, channel lineup, or other factors on the pay-TV provider's side. This perspective assumes a structure where the company presents goods, and the customer selects from among them—a G-D logic point of view. This study examines the pay-TV industry, viewers, and the environment surrounding them as a service ecosystem from an S-D logic framework not found in previous studies of Japanese pay-TV.

The next section will begin with an overview of the TV industry in Japan.

## III. Overview of Japanese television and pay-TV

Japanese television began in 1953 with broadcasting on two channels, the public broadcaster NHK and the commercial broadcaster NTV. Today, there are five commercial broadcast networks and two public networks with nationwide coverage, which are terrestrially based.. The public broadcaster NHK operates based on mainly viewing fees estimated at $6.6 billion annually[11] .

The commercial broadcasting networks each have local stations as affiliates, on a mostly prefectural basis. For example, NNN has 30 local stations in various regions. The Kanto area with Tokyo at its center consists of Tokyo and six prefectures and makes up the largest broadcast area. The Kanto region has NNN's key station, NTV. The second largest is the Kansai area, centered on Osaka, the major city in western Japan. The Kansai broadcast area covers six prefectures including Osaka and Kyoto. The third broadcast area is the Nagoya area in central Japan. These three metropolitan areas—Kanto, Kansai, and Nagoya—cover approximately half of Japan's population[12].

Japan has 47 prefectures, but outside the three metropolitan areas mentioned above, broadcasting stations cover one, or sometimes multiple prefectures. In NNN's case, there are 28 local stations outside the three large areas. The terrestrial broadcasting coverage varies by area, and there are some rural areas with only two commercial networks. The public broadcaster NHK, provides a mix of national and local programming[13].

In 1989, NHK began analog BS (Broadcasting Satellite) broadcasts using satellites. With the switch to digital for terrestrial and BS waves in July 2011, the number of free networks of commercial broadcasts on BS increased to five. In the Kanto area, there are five terrestrial stations, two NHK stations, three independent local terrestrial commercial stations, three BS-NHK stations, and five commercial network-affiliated free BS stations. Thus, for ordinary viewers in the Kanto area, there are total of 18 television stations as of 2016. In addition, there are community channels of cable television station in each area.

Pay-TV, a combination of cable television and satellite television, entered the market dominated by the huge public broadcaster and the five commercial networks. Table 1 summarizes the history of pay-TV.

For a definition of pay-TV, Article 147 of the Japanese Broadcast Act defines paid broadcasting translated from Japanese to English by authors as follows:

> *Broadcasting based on a contract, where reception equipment which enables the reception of its broadcasting is installed and reception is only possible for those who have paid fees relating to the reception through such*

*equipment and which cannot be received without such reception equipment.*

"Reception equipment" refers to the installation of a set-top box (STB) for cable lead-in and as a dedicated tuner for cable television and IP broadcasts, or likely an antenna and STB or TV with an internal tuner to receive the direct satellite signal. The STB or TV would need to have a C-CAS or B-CAS card inserted. On top of that, a reception contract is required to descramble the signal. In addition, this study adds the following elements to the definition of pay-TV.

(1) Paid commercial television service based on a fixed fee.

(2) Excludes NHK terrestrial broadcast and NHK BS broadcast supported by viewing fee income.

(3) Linear (simultaneous) broadcast excluding VOD (video on demand), even if it is part of the service offered by a pay-TV company (examples include cable television and IP broadcasting company).

(4) Includes PPV (pay-per-view).

(5) Pay-TV platforms are cable television companies, telecommunication companies or power companies, DTH （Direct to Home）companies such as SKY PerfecTV with 124/128-degree and 110-degree of satellite broadcasting services and WOWOW, a premium channel using satellite.

(6) While TV sets are the basic viewing devices for audience, some PCs, tablets, smartphones are also included.

Although pay-TV makes use of already widespread television sets, there are certain conditions, meaning not 100% of households can install it. They include: (a) The residence must be in a cable television service area, with an existing cable line or the possibility of cable installation. (b) In the case of direct satellite reception, antenna installation must be possible, and there must be no obstacles in the direction of the satellite. Or, there must be a shared use antenna in the case of a multi-family housing complex or a community. (c) In the case of IP broadcasting, the residence must be in an optical fiber service area, with an existing line or possibility of installation. (d) The television device must have a port that the STB can connect to, such as HDMI of digital port or D1-D5 of analog port.

(7) Excludes the cable television service with terrestrial broadcast retransmission only.

The number of households subscribing to pay-TV by platform, according to CS-TV Advertising Bureau Japan statistics as of June 2015, are 6,397,300 for cable television, 3,397,340 for SKY PerfecTV, 2,798,647 for WOWOW, and 967,008 for IP broadcast, for a total of 13.56 million households[1]. Fig. 1 shows the trend in subscriptions over time. The growth of subscription numbers stopped in 2007, remaining flat since then. The next section will illustrate this pay-TV service ecosystem.

TABLE 1 THE HISTORY OF PAY-TV IN JAPAN[a]

*[a] Edited by Authors based on information from CS-TV advertising bureau Japan, Japan Satellite Broadcasting Association and Japan Cable and Telecommunications Association.*

| | |
|---|---|
| 1987 | Urban cable television begins |
| 1989 | Broadcasting via cable TV through Communications Satellite begins |
| 1990 | WOWOW starts analogue broadcasting via Broadcasting Satellite |
| 1992 | Some channels starts analogue broadcasting through Communications Satellite |
| 1996 | PerfecTV starts as DTH (Direct to home) platform |
| 1997 | DirecTV launched as DTH platform |
| 1998 | Analogue DTH terminates |
| 2000 | DerecTV merged to Sky PerfecTV<br>WOWOW stars the digital broadcasting |
| 2002 | New CS satellite, CS110 degree launches |
| 2005 | IPTV starts |
| 2008 | SkyperfecTV HD begins |
| 2011 | Analogue Broadcast of terrestrial and satellite TV terminate |
| 2014 | The largest MSO (Multi system operator) of cable TV, Jupiter Telecommunications covers almost half of cable TV subscribers |
| 2015 | 4K(Ultra HD) broadcast on CATV and DTH starts<br>CATV terminates digital to analogue transmission of free-to-air TV terminates |

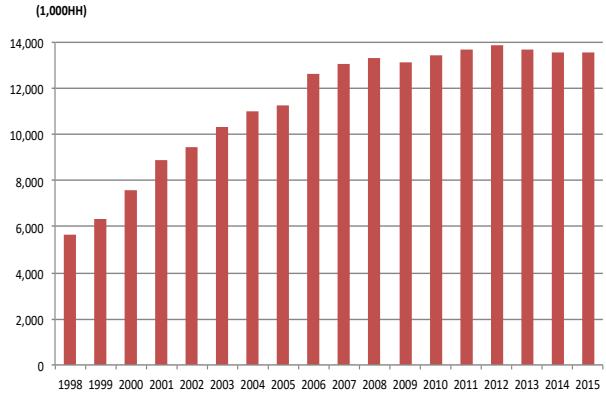


Fig.1 Trend of Pay-TV subscribing households[b]

*[b] Calculated by authors based on CS-TV advertising bureau Japan and WOWOW IR and other resources.*

## IV. THE PAY-TV SERVICE ECOSYSTEM AND ITS ISSUES

Fig. 2 illustrates the service ecosystem of the pay-TV industry and free-to-air broadcasting. The government's role is regulation through laws, approval and licensing of businesses, promotion of industry, and oversight of improvements. For the transition to 4K, for example, government's role in the ecosystem is critical, influencing actors such as production, distribution, STB, receiving TV sets, and the viewing experience. Those roles of the government are truly institutional. Vargo and Lush argue that 'institutions enable the coordination, collaboration, and cooperation of these actors in the value creation process and thus are critical to understanding economic growth' [29].

Program providers acquire programs from licensors or produce them on their own, then broadcast them via platforms. The platforms collect viewing fees from customers, and allocate a portion to each program provider. It should be noted

that for a program provider business partner that should be given priority is platforms. In the case of business of WOWOW which is both program provider and platform, the small ecosystem between channel and platform exists within the organization which is also an larger ecosystem.

Regarding advertisement business, ad sales would be around 10% of revenue of the average channel. In Fig. 2, while audience ratings is used as advertisement transactioen indicator in the terrestrial TV advertisement business model, ratings are not sufficiently functioning as the currency of advertising transactions in the pay-TV business. Regarding the sluggish advertising business in the pay-TV market in Japan, a foreign organization of pay-TV is raising issues concerning the exclusivity of the Japanese TV advertising market[14] .

After a program provider goes through the government approval and selection process for a platform, it broadcasts through that platform. Since pay-TV is a television broadcast, it is only after the audience has watched and experienced, the service is finally delivered to the customer. The actor as the audience just faces the TV and set-top box, but on the other side of the TV for them is a platform such as SKY PerfecTV, or cable television. On this point, some of audience of the pay-TV often may say “I watch the drama on SKYPerfecTV”, not mentioning any channel name.

The platform side generally allocates the subscription fee to channel companies. Cable TV platforms decide the allocation logic and for SkyPerfecTV!(DTH), the committee consists of program providers decides it in cooperation with the platform. In either case, the allocation logic fixes the total amount of viewing fee income for channels for a certain period, so it turns into a zero-sum game amongst the program providers. So for the channel companies, maximizing the allocation from the platform they have an actor-to-actor relationship with is the right self-optimization regarding the pay-TV business. Multiple KPIs (key performance indicators) such as ratings and various indexes from surveys which indicate degree of contribution to the decision and retention of subscription are introduced for the allocation of revenue.

One issue lies in these processes of allocation of subscription revenue in the ecosystem. Because program providers do not reach out to non-subscribers, and have little budget for that. They are mostly dependent on the platforms for promotional efforts aimed at subscribers and non-subscribers. Despite that, being part of a new comer’s decision to subscribe affects the channel’s evaluation.

Although, acquiring and retaining subscribers is an important business objective for a platform, it is impossible to advertise every content and channel equally at the same time. The platform selects some of the best content from lots of channels to promote at an appropriate time. That is apparently an optimization for the platform. But it is also meaningful to take it from the point of view of actors as customers. For example, promotion of pro football during the soccer season is a good move for the platform, but for another channel featuring figure skating, it is not effective. Also, it would be irrelevant to an audience that loves Chinese historical dramas. In other words, there is a limit to the ability to convey multi-channel content to potential viewers when looking at the current service ecosystem as a whole.

In his study of factors in the decision to subscribe to cable TV in its early days in Japan, Yatsuhashi indicated that the existence of a structural vicious cycle involving program suppliers and satellite communication businesses surrounding the cable TV business. When each sector seeks optimization, problems arise in others, it hinders the development of the cable TV business as a results[8]. This identification of a “vicious cycle” in 1995, in the initial stage after the launch of pay-TV when the penetration had not yet reached 10%, was insightful. This article will interpret this insight as an indication of issues facing the cable television ecosystem. As a solution to this vicious cycle, Yatsuhashi suggests “improving cooperation between sectors to increase the benefits of the service to its users.”[8] This is a clear indication of flaws in “cooperation between actors.” When there are flaws in its parts, an ecosystem does not function well. Adner points out that incompleteness of the value proposition in the ecosystem might cause difficulty of service launch despite clearly superior parts of technology, product, and market introduction timing[15].

In another example of an issue in the service ecosystem, program providers produce well-designed color flyers highlighting their featured programs and program lineups every month. At first glance, they seem to be directed at viewers or potential viewers, but they are primarily used for B2B purposes in sales efforts toward platforms and advertising agencies. For example, from the perspective of program provider, it is an optimal way to get carried by a cable television station or maneuver for an increased allocation amount. It is also true that printing 7 million flyers and distributing them to each subscriber is unlikely to be cost effective. When the program provider performs self-optimization to improve profit from the viewpoint of B2B, not all its benefits necessarily go to the actor called the audience. This inefficiency in conveying service value occurs in the ecosystem. This information is useful for the platform, as it is important to grasp program lineups to decide whether to carry the channel. But the information does not directly reach the audience (subscribers) or the potential audience (non-subscribers). This example shows that dyad activities at the micro level in the service ecosystem[29] could be ineffective at the meso or macro level of the ecosystem. The case also implies the possibility that the audience-actor is unable to participate in the co-creation of value in the pay-TV service ecosystem. Perhaps realizing this, one program provider offered to send the same flyer to viewers who requested it as an additional service.

An interesting trend appears in channel names in Japan. For example, a channel called “Channel Ginga(galaxy in English)” changed its name in 2014 to “Channel Ginga, Historical Dramas, Suspense, Japanese Songs.” As platform survey consists of structured questionnaires to select channel names from the lists, it was likely intended to be advantageous in that context. Other companies made similar changes, and their channel names tend to be longer with description of contents. From a brand marketing perspective, chaining product offerings onto the end of the brand name is not usually a good idea. Nike and Adidas, for example, would not tack on additional text or taglines such as “shoes, pants, gear for all

sports" onto their brands. Longer channel names would not fit in the EPG (electronic program guide) shown on the TV, either. The reason is likely an effort to get better evaluations from third parties on surveys conducted by platforms and the committee of channels or an attempt to prompt subscribers to select their channel for the mini channel pack list. Such lines added to channel names are claiming just attributes of the product not brand[16]. A long name is not a matter of brand strategy but sales tactics in marketing theory. In other words, it could be presumed as in G-D logic. Vargo and Lush indicate that, in line with neoclassical economics, actors are regarded as 'highly calculative, rational' consumers[29]. In terrms of S-D logic, those activities of organizations regarding brands could be considered at the meso level[29] in the broader service ecosystem. In other words, activities aimed at optimization at micro or meso level could contradict the optimization at macro level in the entire service ecosystem.

The ecosystem issues above can be proof of an asymmetry in program/channel information between business-side actors such as channels and platforms and audience-side actors. As stated in Fig. 2, platforms conduct promotional efforts directed at non-subscribers to encourage subscriptions. From the nonsubscriber's point of view, without the opportunity to gain sufficient knowledge of programs or channels, there is little interest or desire to watch them, lowering the chances of subscribing. The question of how to resolve the asymmetry in program/channel information between platforms and the audience is a challenge facing the service ecosystem.

According to a program supplier, survey results regarding pay-TV channel brands is the evidence of this. When pay-TV subscribers and non-subscribers were asked about channel brand recognition with aided recall questions, the channel A channel featuring certain popular content has a 70% awareness among pay-TV subscribers but only 25% among nonsubscribers, with no change over last several years. Another channel in tenth had 55% awareness among subscribers, but the tenth channel among nonsubscribers only had a 13% awareness[17]. Such differences of knowledge on channel brands between inner and outer of pay-TV suggests the possibility that channels and platforms as actors don't sufficiently convey the value of pay-TV to nonsubscribing actors. Channels that have relatively higher awareness among nonsubscribers include those that make use of off-air, off-line advertisements and announcements out of homes, as well as those whose channel names and content frequently expose on YouTube. These include premium channels able to engage in their mass and targeted marketing activities, international channels that handle brand marketing on a global scale[18], sports channels that have exclusive sports content like Spanish football, and some anime channels.

While it was mentioned previously in the discussion of the pay-TV service ecosystem model, a more detailed examination of the relationship between terrestrial broadcasting and pay-TV from the standpoint of the audience actor's media use is warranted. Table 2 tabulates the average time spent in home by media and age group within Japanese pay-TV subscriber households. Total media contact time is 6 hours 7 minutes, and of that time, terrestrial broadcasting (commercial broadcasting and NHK together) reaches 2 hours 49 minutes, and after adding 13 minutes for BS broadcasting, it reaches 3 hours 2 minutes for a 49.6% share of total media consumption. Pay-TV is only 23 minutes for a 6.3% share. Intriguingly, among pay-TV subscribers, time of viewing terrestrial TV is overwhelmingly high. Incidentally, looking at the case of the United States, pay-TV overtook networks in ratings among all TV viewers in 1999[19]. In Japan, pay-TV subscribers watch pay-TV selectively and consumption time is limited, and the ratio of subscription maintains that balance. When programs are produced or acquired for terrestrial broadcasting, they are frequently promoted effectively and efficiently on TV as owned media, with an immediate reach of over 10%, in that the free to air TV ecosystem is adequately lossless for on-air promotion and media consumption of audience, creating a virtuous cycle. Taking these matters into account, there is little probability that Japan will ever see pay-TV overtake network television as it has in the US, even amongst pay-TV subscribers.

Next, the following survey show the number of people who subscribe after recognizing the value of paying money to watch programs by genre. Table 3 indicates the relationship between preferred television genre and pay-TV subscription. The survey targeted the head of the household or the person in charge of housework as an approximate participant in the decision to subscribe. Column(A) is the ratio of each genre fan amongst all people and column(B) is the same number amongst pay-TV subscribers. Column(C) is pay-TV penetration by each genre fans. 25% of all people in (A) enjoy watching professional baseball on TV. However, amongst pro baseball fans, only 30% of individuals subscribe to pay-TV. Although the 30% is higher than the general pay-TV subscription rate of 21% in the same survey, it is also a fact that the remaining 70% of people who want to enjoy watching pro baseball on TV do not subscribe to pay-TV. Instead, they may watch it on news programs on terrestrial television or the Internet, or listen to live broadcasts on the radio. Professional baseball game results can be easily viewed on news or variety shows on the network right after the game, or the next morning. Therefore, with many alternatives available, few baseball fans feel the need to subscribe to pay-TV. The same can be said about people who love foreign dramas or movies. People who prefer western drama are about 1.6 times more likely to be already subscribed to pay-TV than all viewers, maintaining a balance in the penetration of pay-TV. In this connection, although respondents selected Yes or No for their television genre preferences in the media survey on Table 3, if the survey had measured preference strength with a kind of multiple staged answering, it might be possible to examine ratio and attributes of hardcore viewers who have a stronger preference and a high likelihood of selecting pay-TV.

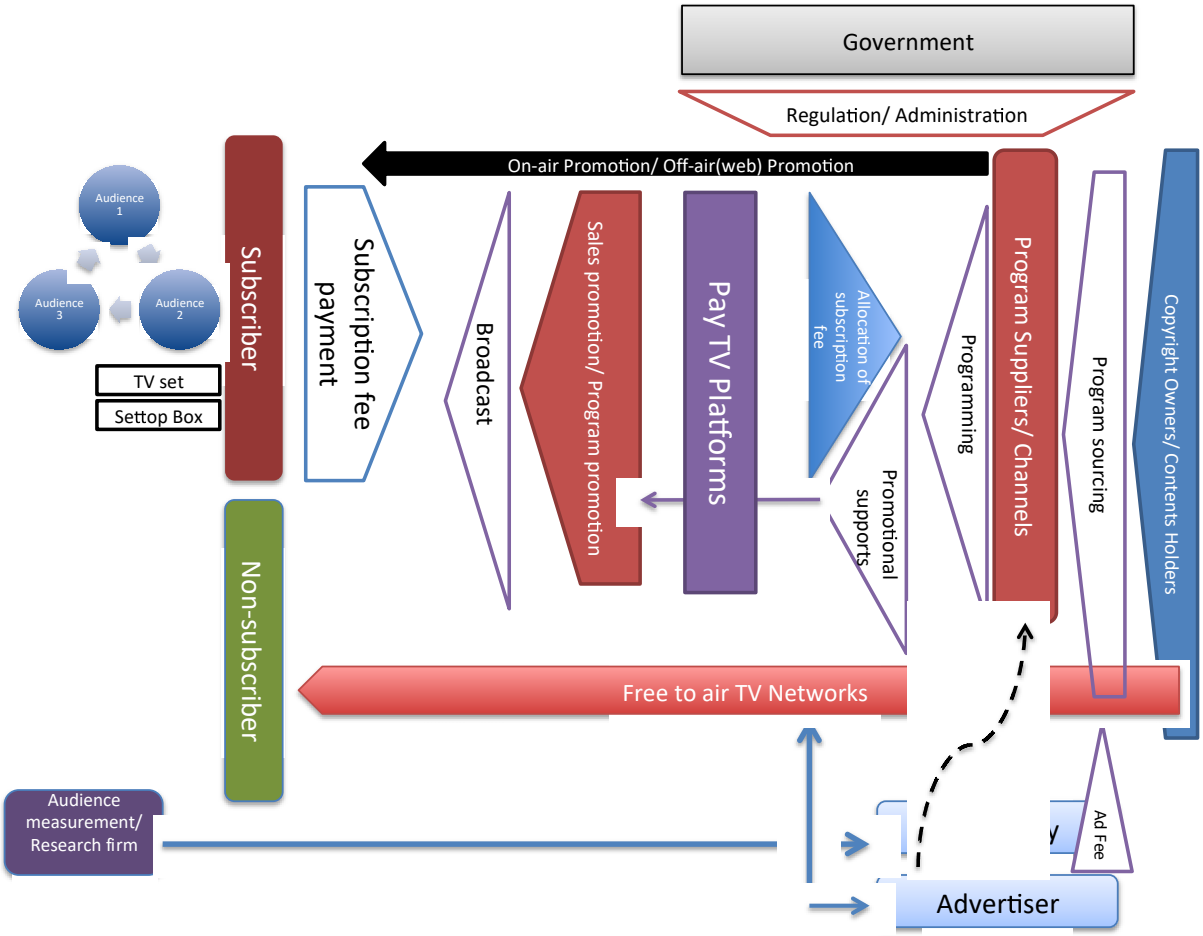


Fig. 2 The model of ecosystem of pay-TV service and Network

TABLE 2 AVERAGE DAYLY TIME SPENT AND SHARE% BY MEDIA AND AGE GROUP[c]

[c] SOURCE: MCR/EX(MEDIA CONTACT REPORT) 2015, VIDEO RESEARCH LTD. c

| | AVERAGE DAILY TIME SPENT IN HOME BY MEDIA AND AGE GROUP | | | | | | |
|---|---|---|---|---|---|---|---|
| Age | 12-69 | 10s | 20s | 30s | 40s | 50s | 60s |
| Terrestrial free-air commercial TV | 2:23 | 1:23 | 1:50 | 1:52 | 2:23 | 2:37 | 3:01 |
| Terrestrial public TV | 0:26 | 0:06 | 0:08 | 0:20 | 0:12 | 0:32 | 0:53 |
| Broadcasting satellite TV | 0:13 | 0:03 | 0:05 | 0:02 | 0:05 | 0:18 | 0:28 |
| Pay-TV | 0:23 | 0:21 | 0:12 | 0:25 | 0:24 | 0:25 | 0:27 |
| Time shifted view | 0:35 | 0:06 | 0:20 | 0:43 | 0:34 | 0:48 | 0:36 |
| Radio | 0:08 | NA | 0:04 | 0:01 | 0:05 | 0:07 | 0:20 |
| Newspaper | 0:09 | NA | 0:01 | 0:01 | 0:04 | 0:11 | 0:23 |
| Magazine | 0:01 | 0:02 | NA | NA | 0:01 | 0:02 | 0:03 |
| Internet mail and SNS/ PC and Tablet | 0:31 | 0:09 | 0:31 | 0:18 | 0:27 | 0:41 | 0:40 |
| Internet other than mail and SNS/ PC and Tablet | 0:29 | 0:09 | 0:30 | 0:18 | 0:26 | 0:40 | 0:37 |
| Internet mail and SNS/Mobile phone | 0:27 | 1:11 | 1:07 | 0:29 | 0:22 | 0:18 | 0:08 |
| Internet other than mail and SNS/ Mobile phone | 0:17 | 0:46 | 0:43 | 0:20 | 0:15 | 0:11 | 0:03 |
| Game/ TV monitor | 0:02 | 0:03 | 0:04 | 0:01 | 0:01 | NA | 0:02 |
| Game/ Mobile | 0:02 | 0:13 | 0:02 | 0:03 | 0:02 | NA | NA |
| Phone call | 0:01 | NA | NA | 0:01 | 0:01 | 0:01 | 0:03 |
| Total | 6:07 | 4:32 | 5:37 | 4:54 | 5:22 | 6:51 | 7:44 |

| | SHARE% of TIME SPENT IN HOME BY MEDIA AND AGE GROUP | | | | | | |
|---|---|---|---|---|---|---|---|
| 12-69 | 10s | 20s | 30s | 40s | 50s | 60s |
| 39.0 | 30.5 | 32.6 | 38.1 | 44.4 | 38.2 | 39.0 |
| 7.1 | 2.2 | 2.4 | 6.8 | 3.7 | 7.8 | 11.4 |
| 3.5 | 1.1 | 1.5 | 0.7 | 1.6 | 4.4 | 6.0 |
| 6.3 | 7.7 | 3.6 | 8.5 | 7.5 | 6.1 | 5.8 |
| 9.5 | 2.2 | 5.9 | 14.6 | 10.6 | 11.7 | 7.8 |
| 2.2 | NA | 1.2 | 0.3 | 1.6 | 1.7 | 4.3 |
| 2.5 | NA | 0.3 | 0.3 | 1.2 | 2.7 | 5.0 |
| 0.3 | 0.7 | NA | NA | 0.3 | 0.5 | 0.6 |
| 8.4 | 3.3 | 9.2 | 6.1 | 8.4 | 10.0 | 8.6 |
| 7.9 | 3.3 | 8.9 | 6.1 | 8.1 | 9.7 | 8.0 |
| 7.4 | 26.1 | 19.9 | 9.9 | 6.8 | 4.4 | 1.7 |
| 4.6 | 16.9 | 12.8 | 6.8 | 4.7 | 2.7 | 0.6 |
| 0.5 | 1.1 | 1.2 | 0.3 | 0.3 | NA | 0.4 |
| 0.5 | 4.8 | 0.6 | 1.0 | 0.6 | NA | 0.0 |
| 0.3 | NA | NA | 0.3 | 0.3 | 0.2 | 0.6 |
| 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

TABLE 3 RELATION OF FAVORITE TV GENRE AND SUBSCRIPTION OF PAY TV [d]
[d]. (A)AND (B): VERTICAL %, (C): HORIZONTAL %
SOURCE: ACR/EX 2015. VIDEO RESEARCH Ltd. ,

| Favorite TV genre | (A) Ratio of each genre fan amongst All people | (B)Ratio of each genre fan amongst Pay-TV subs | (C)Pay-TV penetration amongst each genre fans |
|---|---|---|---|
| All | 100.0 | 100.0 | 21.2 |
| Western drama | 18.9 | 29.8 | 33.4 |
| Asian drama | 11.9 | 17.2 | 30.8 |
| Hollywood/ European movies | 33.5 | 43.0 | 27.2 |
| Pro baseball | 24.4 | 34.5 | 30.0 |
| F1 and other motor sports | 7.6 | 9.9 | 27.5 |
| Rugby football | 3.4 | 4.4 | 27.7 |
| European pro football | 4.4 | 6.7 | 31.9 |

## V. THE STRENGTHS OF THE ECOSYSTEM

The sections above have discussed the possibility that the self-optimization efforts of actors in the pay-TV ecosystem have unintentionally created inefficiencies in the overall ecosystem, and that that pay-TV has managed to maintain a balance despite pressure from strong competition from commercial networks and NHK. This section will explore the advantage of pay-TV that enables it to maintain stable subscription rates—the existence of TV devices in the pay-TV ecosystem model diagram.

In the language of S-D logic, institutions in the service ecosystem are critical. Institutions are 'humanly devised', 'integrable resources' and fundamental to the understanding of the value co-creation processes [29]. Institutions can be paraphrased as artifacts [29]. Simon distinguishes the artificial which is 'synthesized by human beings' from the natural[31]. In this respect, it seems feasible to focus on artifacts in the service ecosystem.

There is an idea known as the saturation of artifacts. Automobiles, one type of artifact, reached saturation in advanced countries at approximately one car for every two people, cars are considered not to increase further[20][21]. In Japan, the household penetration rate for automobiles reached 80% as of 1991 and since then it has maintained the level until 2015[22] . Saturation has reached at one car for every two people and 80% households in Japan.

Fig. 3 shows the household penetration of TV sets, video cameras and Pay-TV over time. The video camera added on the chart as consumable goods close to television reached 39.1% in 2003, almost saturated. In the case of of home-use video cameras, although family use them for photographing children's growth and local events are typical, not everyone needs to be a video cameraman, and smartphones have already become substitute goods. Hence, there would be little possibility of growth for video camera market in the future.

Then an artifact called TV sets (television receivers) is much debated. It started in 1957 with 7.8% for black-and-white TVs and nearly reached the 80% mark in 1962 with 79.4% on Fig. 3. In 1965, it reached 90.0%. Half a century before the transition to digital in 2011, television experienced the innovation from black-and-white to color. From a 1968 peak of 96.4% black-and-white sets were replaced by color, and color TVs reached 98.2% in 1980. Black-and-white and color TVs combined exceeded 90% after 1965 and obviously reached saturation. While cars took 30 years to reach the 80% mark, TVs had spread to 80% in seven or eight years and went past it to nearly 100%. Furthermore, the presence of a TV device indicates that the household views free-to-air broadcasts at a minimum. The actual weekly reach (viewing experience rate) amongst TV-owning households is constantly in the 95% in Japan[23] .

The average number of TV sets in a household is 2.1[24]. As shown in Fig. 4, the proportion of a number of people in the household to a number of TV sets is very close. Other parameters should also be noted regarding the technical environment when considering the number of TV sets. According to Kimura et al., by a shift toward personal viewing from family viewing, average number of TV sets in a household had increased from 1985 to 2000. After 2011 of the year of digital transition of terrestrial, people had to purchase new digital TV sets, decreasing slightly the average number of TV sets in a household[25]. In any case, the critical point for this study is the fact that TV household penetration reached saturation of almost 100% in 1968 and has remained stable since. Rather than discuss whether pay-TV penetration will rise or stagnate, it may be more appropriate to regard firstly the pay-TV as a service added to an already saturated TV market. That is, pay-TV entered the mature television broadcasting service with a huge platform as a value-added paid service. In addition, as seen in Tables 2, the terrestrial broadcast networks and public broadcaster that monopolized TV for so long have responded well to the taste of Japanese people—even amongst subscribers to pay-TV, the viewing share is only 11% of total TV viewing time. Despite that, the pay-TV is still able to maintain that 11%, largely due to the reason that it is delivered via TV sets which are already saturated artifact.

For OTT content in Japan, stick tuners that attach to TVs have not caught on, and most viewers of OTT use PCs, tablets, or smartphones. Furthermore, since the subscription of OTT is based on a personal contract, customers can easily cancel the contract after the free trial period or after a relatively short terrm. However, pay-TV is based on household contracts and in many cases the head of the household is the contracting party. The subscribers of the pay-TV tend to be families with multiple members rather than single individuals. According to a Research Institute's survey, amongst pay-TV subscribers 20 years old or over, people living alone made up 14.4%, four points lower than the 18.5% overall rate for individuals[26]. This tendency relates to cancelation of pay-TV services. For example, if a family with a husband, wife, and one elementary

school-age child has a subscription, as long as one person out of the three is watching, that will act to deter the subscriber from canceling. Fig. 5 indicates actual reach% of pay-TV for 4 weeks by age group based on the audience measurement. All age groups except for respondents in their 20's shows high reach. Thus, these micro level structure and activities have strengths to encourage pay-TV subscribers to maintain their contracts. In contrast, "family effects", so to speak, occur less in OTT with an personal contractor who can easily decide to cancel it after finishing a season of a drama series.

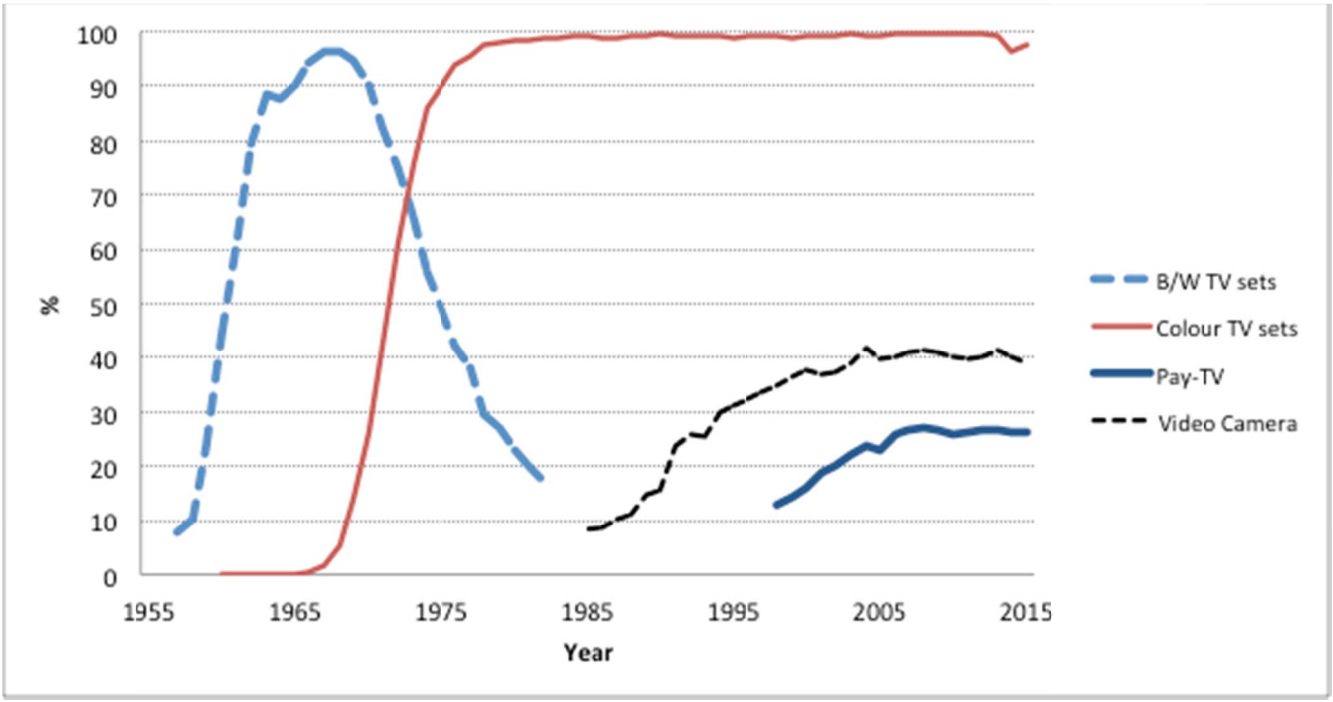


Fig. 3 Diffusion of TV set, Video camera and Pay-TV[e]

[e] *Source: Consumer Confidence Survey, CS-TV advertising bureau Japan , WOWOW IR and other resources.*

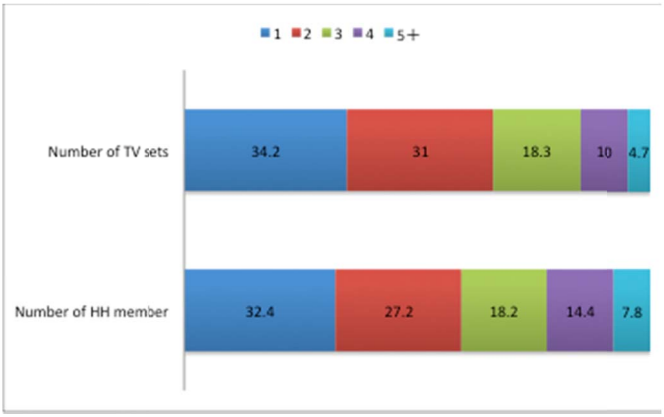


Fig. 4 Distribution of number of TV and number of HH members in Japan[f]

[f] *Source: NHK and Census of Japan 2010.*

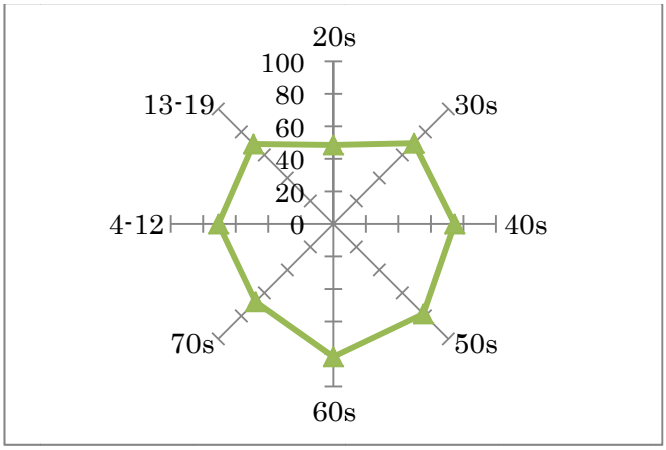


Fig. 5 Reach% of Pay-TV for 4 weeks by age group[g]

[g] *Source: The Pay-TV audience measurement by CAB-J members*

*Term: 4 weeks in June and August 2015, Criterion of reach is over 30 minutes viewing.*

## VI. Conclusion

This paper has analyzed the pay-TV industry—seen as having stagnant penetration by observers inside and outside the industry—as well as viewers and the environment surrounding them using S-D logic methods. In television service, viewers consume programs and experience them to create some amount of value. The pay-TV does not end with a subscription contract and broadcast. That is why the S-D logic framework is useful here.

Various actors play roles in the pay-TV service ecosystem, from content holders to channel companies, distributors, and platforms. When each actor makes efforts to optimize their business as a matter of course, inefficiencies can occur in the overall ecosystem that includes the audience. Also, it was argued that the terrestrial networks and the public broadcaster that once monopolized the television screen have acquired their audience and the largest share of media consumption through a mostly lossless ecosystem, and that this remains true for even for pay-TV subscribers. Also, it was shown that the exclusivity of pay-TV content is not absolute, and network broadcasts and other sources can function as alternatives as the pro baseball programs. Despite its stagnant penetration level, it is possible to argue that the ability to maintain the roughly 20% penetration rate is caused by the facts that pay-TV is media delivered through the TV—an artifact that has reached saturation—and that it is a service that cannot easily be canceled because it is a household asset based on a household contract. Additionally, viewing share of 11% of pay-TV is not low in all TV platforms amongst pay-TV subscribers.

Here, an attempt to generalize findings in the above discussions could be made.

First, dyad activities between actors at the micro level or the meso level could work both to maintain and inhibit growth of an industry contained in a service ecosystem.

Second, when the spread of a certain service is studied, it is an effective method to investigate how a certain artifact, such as device, medium and sales network which is an important part of the service ecosystem spreads in the market or the society. By considering the degree of saturation of the artifacts, it is possible to conduct our further research on print media's ecosystem which is shrinking.

While TVs have reached saturation regarding household numbers, it is also true that a group of younger people who do not own TVs is emerging. While they only make up a small fraction of the population, some researchers point to the TV non-ownership rate among younger households[27] as a crucial issue facing the whole television industry.

The percentage of unmarried people is 71.8% for men aged 25 to 29, 47.3% for ages 30 to 34, and 35.6% for ages 35 to 39. For women, it is 60.3% for ages 25 to 29, 34.5% for ages 30 to 34, and 23.1% for ages 35 to 39[28]. These data suggest that many Japanese are likely to be single for the rest of their lives in the near future, which is an unfavorable trend for all household-based industries including pay-TV and automobiles. Changing the view point, if OTT-type services with individual contracts make inroads into TV devices through sticks or other means, that will no doubt lead to changes in the service ecosystem of pay-TV. From the pay-TV side as well, it is possible that enhanced VOD services on the TV like those provided by major cable companies in the US and Japan might change the pay-TV service usage dynamic. If such changes occurred in the video market, Weider et al. suggest that the disruption and change of traditional value co-creation practices could occur[30]. This would mean that the service ecosystem is a self-adjusting system[4]. In either case, trends of pay-TV and OTT services should be closely observed in the future.

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