

Yonetani, Nami; Sugaya, Minoru

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The Role of Cable TV Operators as a Facility based Competitor in the Local Broadband Market: A Case Study from Three Competitive Areas in Japan

Authors: Nami Yonetani & Minoru Sugaya / Presenter: Nami Yonetani

**Ph.D. Student, Graduate School of Media and Governance, Keio University
Professor, Institute for Media and Communications Research, Keio University**

namiyonetani@gmail.com
sugaya@mediacom.keio.ac.jp

Introduction

This study conducts a case study in areas which Cable Internet penetration is high, and focuses on the role of Cable TV operator as a facility-based competitor. The how and why of active facility-based competition is analyzed through the case study. In according with above, this study also presents two models of an active facility-based competition in the local broadband market by examining the impact of local informatization policy on local broadband market structure and Cable TV operators.

The composition of this paper is as follows. Section 1 describes an association between this paper and previous studies. Section 2 describes materials and method. Section 3 describes results and discussion and section 4 is the conclusion.

1. Previous Research

Although the Cable TV studies in Japan have varied with the Cable TV operation's business development, most of their interests were focused on their role as a community media. For example, the Cable TV studies in the 1960s to the early 1980s, when the Cable Television Broadcast Act was established and Cable TV operators started to produce independent programs, were held with the object of "providing local information" and "fermenting a sense of region" [Takeuchi and Tamura, 1989]. Sakata [1976], a study which organized the diffusion process of Cable TV and captured its role change, and Inoue and Taki [1984], a study which held a current state analysis of Cable TV operators in the 1980s, are the concrete examples. In the 1980s, when urban-type Cable TV started and multichannel service came off, Wakabayashi [1988] and Yamada [1989] outlined the actions taken by Cable TV operators in urban areas. Since 1990, the Cable TV's role as an IT infrastructure attracted the attention of scholars as Cable Internet service and Cable phone service were launched. Iwabuchi [1996] and Hiratsuka and Kanazawa [1996] discussed about the possibility of Cable TV's two-way communication function. In more recent years, studies pertaining to community channel and public access are increasing. Ogawa [2005] which captured Cable TV as a place to media for community residents and Miyamoto and Yoshikawa [2008] which analyzes Cable TV's role to forge a community identity are the examples. As just described, most of the Cable TV studies are focusing on Cable TV's community media role. While on the other hand, Cable TV studies which focuses on the role as a facility-based competitor in the local broadband market are very limited.

Incidentally, since the former Ministry of Post and Telecommunications designated some city as a subject area of Teletopia program¹ in 1983, decent numbers of case studies were held in the studies of regional informatization in Japan. However, there are few studies which discuss about the impact of local informatization policy on Cable TV operators. Among them, studies with facility-based competition in local broadband market are very little. The shift of the research focus from local governments to private sectors such as NPO and NGO might also been a factor of this shorthanded field [Tahata, 2010].

Recently, however, the role of public sector in the Information and Communication field has recapture the attention, as PPP has begun to been used as an efficient approach to establish IT infrastructure. For example, Uchida [2009] organized local informatization plans which each prefectural government announced after 2000 in 5 directions: (1) Improvement of human resource development and information literacy; (2) Providing administrative services and public service to make safe, convenience and rich life; (3) Informatization and revitalization of local firms and local industries; (4) Informatization of government; (5) IT infrastructure development. On that basis, Uchida [2009] explained that many prefectures have a greater emphasis on "IT

¹ Teletopia Project is a subsidies project which was launched by the former Ministry of Post and Telecommunications in 1983. The project designates some city as model areas, and supports the setting up of IT facility including Cable TV network and optical fiber network.

Infrastructure development", and pointed out that the mention of PPP with local governments and Cable TV operators converge in the framework of "IT infrastructure development". The case areas in this paper are not exception too.

This paper will cover the shorthanded field of Cable TV studies and local informatization studies in Japan by examining the impact of local informatization policy on local broadband market structure and the role of Cable TV operators as a facility-based competitor. In addition, this paper will provide a new point of view in local informatization studies by examining the possibilities and limits of PPP for IT infrastructure development.

2. Research Method

(1) Materials and Method

This paper conducts a case study of Tsu city Mie prefecture, Toyama city Toyama prefecture and Nagasaki city Nagasaki prefecture. These areas were found to have high Cable Internet penetration and distinctive informatization policy by a nationwide survey which the author conducted in February 2011². The purpose of the case study is to examine the effects on informatization policy on Cable TV operators and local broadband market and to clarify the motives of participation of Cable Internet users.

Specific research methods are as follows. Firstly, an interview research with Cable TV operators and prefectural governments were held³. In the survey, Cable TV operators were asked about their partnerships with local governments and management strategies while prefectural governments were asked about the position of Cable TV operators in their informatization policies and the methods of developing IT infrastructure. Secondly, the author sent out a web questionnaire survey to the internet users in the case areas in March 2012. The survey was carried out as a joint research project with the Institute for Information and Communications Policy of the Ministry of Internal Affairs and Communications. The purpose of the web questionnaire survey is to clarify the motives of participation. There were 50 valid responses from each case area.

(2) Analysis Framework

This paper will organize the data obtained from the survey by using PPP as a framework and clarifies the differences of the informatization policy in each case area. It has been considered that the role of private sector and public sector both has a limit in the Information and Communication field. In traditional economics, a market situation when the allocation of goods and services by a free market is not efficient is called "market failure". This also happens in the Information and Communication market. Because the fixed costs of Information and Communication equipment is enormous and the scale of economics works, natural monopoly, a phenomenon that the first mover win an advantage over small businesses, will be created. Monopoly operators might raise the price, contract the supply, or be discriminating in supply by using their position.

² The survey was carried out as a joint research project with the Institute for Information and Communications Policy of the Ministry of Internal Affairs and Communications. The purpose of the survey was to clarify the use of internet in Japan. See Yonetani, N. et al. (2012) Analysis on Media, Network, Service and Local Information use trend in the region. *Keio Communication Review*, Keio University, 62, pp.189-203. for information.

³ The candidates of the interview survey are as follows.

Mie prefecture, Policy Section, Office of Information Policy (February 8th, 2012), ZTV Inc. (February 8th, 2012), Nagasaki prefecture, Administration Office, Information Policy Division (February 9th, 2012), Nagasaki Cable Media Inc. (February 9th, 2012), Toyama prefecture, Information Policy Division (June 8th, 2012), and Cable TV Toyama Inc. (June 8th, 2012).

On the other hand, “government failure” may be created too. Although the definition and types of “government failure” varies among the scholars, general issues pointed out are; the idea of believing that it doesn’t matter to be inefficient with public works, opaque cost-effectiveness that balloons budget and organization, and private sector re-employment for government officials who retire [Nemoto, 2012]. In the Information and Communication field, budgetary restrictions and the barrier effectiveness of the public sector might create ineffective infrastructure development. What is more, business deployment of public sectors might deprive private sectors of a business opportunity and stunt the growth of local IT companies.

According with the limits of private sector and public sector in the Information and Communication field as above, PPP is attracting attention as a new method to develop IT infrastructure nowadays. Generally, the position which takes “market failure” seriously gives high value on the government’s role and the position which takes “government failure” seriously gives high value on the market’s role. However, PPP is useful in terms of “it’s departure from the simple dichotomous theory” [Nemoto, 2010]. As PPP provides an appropriate allocation of roles between public sector and private sector, it avoids risking failure that would arise from the complete dependence on public sector or private sector.

Although the definition of PPP differs by scholars, this paper will conduct a case study based on the definition of the Toyo University PPP Research Center. The definition of PPP by the Toyo University PPP Research Center is a below.

PPP is a method to implement projects which has some sort of policy objectives such as provision of public services and regeneration of the local economy. That is, the division of roles of public sectors(e.g. the state, local government, public institution) and private sectors(e.g. private company, NPO, citizen) in goal determination, facility construction, facility ownership, and financing. In addition, (1) risk and return designing and (2) governance by contract have to be used as a principle when doing so.

There are two reasons for using this definition. Firstly, it specifies about "risk" and "contract". Third sector is a primitive form of PPP and it was widely used as a public work method during the bubble economy years. However, there were many cases that fell apart because the "risk" sharing between the public and private sector wasn't specified on the "contract". As PPP is designed to avoid such mistake, it is necessary to clarify the difference between the two. Secondly, it contains "regeneration of the local economy" as a purpose of PPP. Since one of the main purposes of the local informatization policy is the restoration of the local economy, it is considered appropriate for using the definition which contains it.

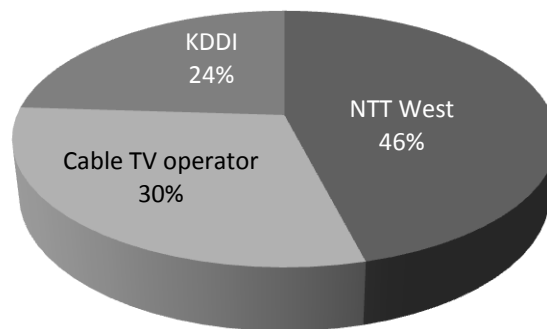
3. Result and Discussion

(1)A Case in Tsu City, Mie prefecture

Current State of the Local Broadband Market

As a result of the Web survey that the author conducted in March 2012, the share of facility-based competitors in Tsu city was; NTT West 46%, Cable TV operator 30% and KDDI 24% (Figure 1). From the fact that the shares of Cable TV and KDDI are above the national average, it was found that facility-based competition in Tsu city is promoted. However, power companies and railway operators seem to fail to break into the market.

FIGURE 1: Current state of
the local broadband market in Tsu city (March 2012)



Local Informatization Policy

In 1993, Regional Information Systems Laboratory published "Survey on CATV's Public Utilization" which is a report commissioned by the Mie Prefecture Information and Communications Infrastructure Association. This is the first Cable TV related report which Mie prefecture is involved, and it illustrates the prefectural vision on Cable TV measures. The report assumes Cable network as a "new social capital" and complains the need for its integral plan and development. Specifically, it is said that they need to network Cable TV stations which would be developed throughout Mie prefecture and use it as an IT infrastructure to correct the digital divide.

Since then, Inan-cho launched Inan Cable System as a very first local government operated Cable TV station in October 1995 by being authorized as a New-generation Local Cable Television Facilities Development Project⁴. With this case as a start, prefectural government began working actively to develop Cable TV in other regions too. Masayasu Kitagawa, who was elected governor in April 1995, played the central role in it. After Kitagawa showed a specific policy and its direction towards the Cable network development in "Survey Report on the Utilization of Multimedia in Mie Prefecture" in 1996, many new Cable TV stations opened and expanded their service area. Cable network was developed throughout much prefecture in March 2003. They also started Cable Internet service from April the same year.

At the same time, "Administration Network in Mie Prefecture" and "Mie M-IX" was built by utilizing Cable network. "Administration Network in Mie Prefecture" is an administration WAN and "Mie M-IX" is a free open information network mainly for enterprises. However, "Mie M-IX" was remodeled to a high-capacity next generation optical network "SMIX, Super Mie Internet eXchange" in 2008 which provides network service to municipalities, educational institutions, private companies and individuals. Unlike to "Mie M-IX", "SMIX" is a private managed network which was funded only by Cable TV operators.

Developing Methods of Cable Network

ZTV Inc., a Cable TV operator which cover Tsu city, was founded in 1990 as a third sector and started their service in 1994. They were able to reduce the initial investment cost by receiving subsidies and special tax saving from Teletopia Project and New-generation Local Cable Television Facilities Development Project.

⁴ New-generation Local Cable Television Facilities Development Project is a subsidized program by the Ministry of Internal Affairs and Communications. It supports the development of Cable TV facilities which provides local information through community channels or interactive and advanced application services.

ZTV has also succeeded in expanding their service area without spending too much cost by having a PPP agreement with the local government. The local government which was wishing for the development of broadband network and communication network has; paid the registration fee for every household to ZTV in advance, campaigned for local residents to become a cable subscriber, and offered a municipality owned broadcast network to ZTV. Thus, ZTV was able to extend their service area with minimizing risks and costs, and the local government was able to bridge the digital dived at once. In some cases, ZTV also supported the local government's PR activity and undertook the repair of the network.

Management Strategy of the Cable TV operator

ZTV has adopted the following management strategy.

(1) Strengthen customer interactions

Holding free PC classes, field service and setting up an in-house call center is given as a specific example. Winning customer's trust is a way of local contribution and it also helps to prevent customer migration.

(2) Provide local information

For Cable TV operators to play a role as a local media, it is considered that community channel is essential.

(3) Provide wide area network service

As a concrete instance, wide area network service includes corporate network services and database business especially for local companies. Contribution to the local businesses and the local economy are expected.

(4) Promotion of triple play service

Triple play service does not only expand Cable businesses, but also provides discounts, efficiency and feelings of security to customers by unifying payment recipients and contacts to ZTV, a community-based company.

As seen above, ZTV's management strategies focus on community-based services in particular.

Features of the Cable Internet User

Figure 2 describes the motives of participation, internet access cost per month, and the assessment of cost of DSL users, Cable Internet users (i.e. ZTV subscribers) and FTTH users in Tsu city. The figure is based on the results of web questionnaires survey which the author conducted in March 2012. While many of DSL users and FTTH users cites "Because of the low cost" as a penetration reason, most of the Cable Internet users cites "Because it has been made use of formally (70%)". There were no Cable Internet users who cited "Because of the low cost" as a motive of participation. As Cable Internet user's assessment of cost is "a little expensive", it is shown that Cable Internet users in Tsu city value familiarity more than low cost.

FIGURE 2: Internet users in Tsu city

Tsu city			DSL	Cable Internet	FTTH	chi-square test
	Motives of participation	Because of the low cost	15%	0%	65%	0.002
		Because it has been made use of formally	35%	70%	15%	0.005
		Because of the brand and the feeling of trust	0%	0%	30%	0.005
		Because of the rich service	0%	5%	20%	0.427
		Because it is a community-based operator	15%	10%	5%	0.849
	Monthly fee	Internet access cost per month	¥0 – ¥6,000	¥2,000 – ¥8,000	varied	0.115
		Assessment of cost	a little cheap	a little expensive	varied	0.158

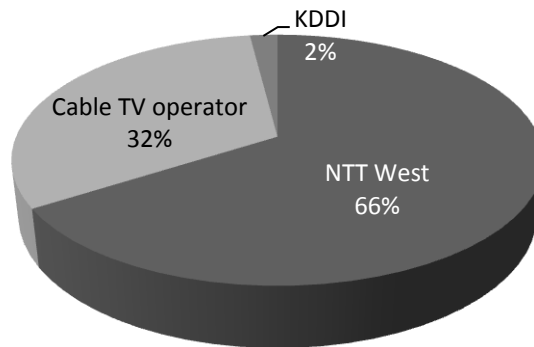
※multiple answers allowed for "Motives of participation"

(2)A Case in Toyama City, Toyama prefecture

Current State of the Local Broadband Market

As a result of the Web survey that the author conducted in March 2012, the share of facility-based competitors in Toyama city was; NTT West 66%, Cable TV operator 32% and KDDI 2% (Figure 3). Although the competition between NTT West and Cable TV operator is promoted, other facility-based operators have not entered the market successfully.

FIGURE 3: Current state of
the local broadband market in Toyama city(March 2012)



Local Informatization Policy

In 1999, Toyama Prefecture has announced "Toyama Information Frontier Vision" which advocated the necessity to expand Cable network for "the development of network infrastructure to support multimedia society". Some basic directions for the prefectural government were set out as below. Firstly, prefectural government will "support Cable TV operators to launch a station or to expand service areas. It will help Cable TV operators to provide useful local information to the local residents". Secondly, prefectural government will promote Cable TV operators' market entry and the building of interconnection network between Cable TV stations. It will make Cable TV operators a comprehensive network infrastructure which provides broadcasting and communication. It would also be a tool for providing administrative service such as distance learning and home care. In other words, the prefectural government supported Cable TV operators because of its function as a regional IT infrastructure which would provide local information. However, at this point, there were no references about developing Cable network in the whole prefecture or building public network by using Cable network.

However, after "National Sports Festival in Toyama 2000" was held in October 2000, the emphasis of informatization policy in Toyama shifted to the development of Cable network in the whole prefecture and building public network by using it. In the summer of 1999, the previous year of the National Sports Festival, Yutaka Nakaoki who was the Governor of Toyama proposed Cable TV operators to rebroadcast the sport festival. In August in the same year, Toyama Prefecture CATV Operator's Council was founded to coordinate Cable TV operators, and the Cable network developed rapidly soon after the prefectural government formally made a request for the rebroadcast in October. As the stadiums were located in various part of the prefecture, an interconnecting network between Cable TV stations was necessary. As a result, "Ikiiki Net Toyama", the first interconnecting cable network in Japan, was completed in August 2008 by using subsidies from New-generation Local Cable Television Facilities Development Project.

Then after, "Toyama Multi Net", a prefectural information highway based on "Ikiiki Net Toyama", started its operation since 2002. Information highway vision had not been achieved so far because of the high cost, but it became possible to build at low cost by using the Cable network. Cable network was laid in almost all areas in Toyama prefecture in March 2005 by the aggressive support of the prefectural government and local government.

Developing Methods of Cable Network

Cable TV Toyama Inc., a Cable TV operator which cover Toyama city, was founded in 1994 by accepting an investment from Telecommunication Divide Fund⁵,

⁵ Telecommunication Divide Fund is a subsidized program by the former Ministry of Post and Telecommunications. It provides financial supports to municipalities which are aiming to bridge the telecommunication divide.

Toyama prefecture, Toyama city, and local companies. Since there were only 3 prefecture including Toyama which didn't have Cable TV station in the prefectural capital, Toyama Chamber of Commerce and Industry played a central role to set up Cable TV Toyama by discussing its business feasibility with the former Ministry of Post and Telecommunications.

As it is already mentioned, "Ikiiki Net Toyama" was built with the support of the prefectural government. Cable TV Toyama has achieved customer acquisition and service area expansion by enjoying the following benefits from "Ikiiki Net Toyama". Firstly, "Ikiiki Net Toyama" increased the cohesion of Toyama Prefecture CATV Operator's Council. Working together on the development and management of "Ikiiki Net Toyama" did not only improve the technical capabilities but also built human networks between Cable TV operators. This human network made an agreement to make human support in case of emergency. Secondly, "Ikiiki Net Toyama" contributed to introduce new services. Cable TV Toyama was able to correspond to IP phone service and terrestrial digital broadcasting at an early stage because "Ikiiki Net Toyama" has built networks both for broadcasting and communication at the same time. Thirdly, "Ikiiki Net Toyama" made Cable TV Toyama possible to produce high quality program in a low cost way. Not only joint procurement of CS programs became possible by "Ikiiki Net Toyama" but it also made Cable TV operators possible to exchange their self produce programs. It improved the program quality dramatically by stimulating Cable TV operators in both content side and technology side. Fourthly, the value of Cable network improved. After "Ikiiki Net Toyama" was positioned as a regional information infrastructure backbone and was pulled into local government relevant facilities such as hospitals, libraries and community centers, the Cable Internet penetration increased. Also, the reliability of Cable TV network increased as "Ikiiki Net Toyama" was used as a disaster information infrastructure of Ministry of Land, Infrastructure, Transport and Tourism.

Management Strategy of the Cable TV operator

Cable TV Toyama has adopted the following management strategies.

- (1) Provide information that will contribute to regional revitalization
Enhance self-produced contents about news, festivals and sports in the region, and provide information which directly affects the local residents such as weather warning and live broadcasts of local council is given as a specific example. Improving the program quality and increasing the content by exchanging self-produced programs through "Ikiiki Net Toyama" is also needed.
- (2) Improve customer service
Not only prompt customer support, but development of products which meet the needs of local residents is also important. For example, Cable TV Toyama is differentiating themselves from the competitors by providing 5 types of Internet-access services which has different line speed while the major telecom company NTT provides a single content service.
- (3) Strengthen business cooperation with local companies
Providing sensitive customer service by cooperating with local electronic stores and electrical contractors is needed.
- (4) Construction of next generation network
Upgraded Cable TV network and wireless LAN service is provided to expand the customer base.

As seen above, Cable TV Toyama's management strategies focus on community-based services and individual services in particular.

Features of the Cable Internet User

Figure 4 describes the motives of participation, internet access cost per month and the assessment of cost of DSL users, Cable Internet users (i.e. Cable TV Toyama subscribers) and FTTH users in Toyama city. Most Cable Internet users point "Because it has been made use of formally (50%)" and "Because it is a community-based operator (25%)" out as motives of participation. Especially, the percentage of "Because it is a community-based operator" leave DSL users and FTTH users far

behind. The Internet access cost per month is expensive in the order of FTTH users, Cable Internet users, and DSL users. The assessment of cost is proportionate to that order. It is shown that Cable Internet users in Toyama city value familiarity and regionality more than low cost.

FIGURE 4: Internet users in Toyama city

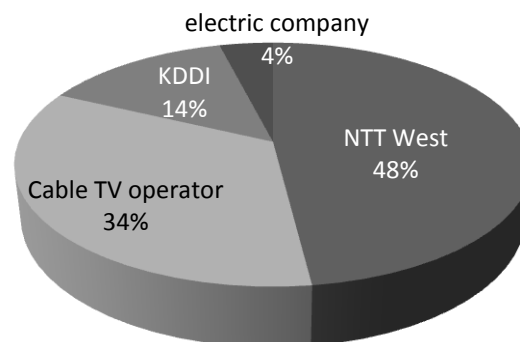
Toyama city	Motives of participation		DSL	Cable Internet	FTTH	chi-square test
		Because of the low cost	35%	25%	20%	0.779
		Because it has been made use of formally	65%	50%	45%	0.588
		Because of the brand and the feeling of trust	20%	5%	40%	0.066
		Because of the rich service	0%	5%	5%	0.958
		Because it is a community-based operator	0%	25%	5%	0.45
	Monthly fee	Internet access cost per month	¥0 – ¥4,000	¥2,000 – ¥10,000	¥4,000 – ¥20,000	0.223
		Assessment of cost	cheap	a little expensive	expensive	0.034

※multiple answers allowed for “Motives of participation”

(3)A Case in Nagasaki City, Nagasaki prefecture Current State of the Local Broadband Market

As a result of the Web survey that the author conducted in March 2012, the share of facility-based competitors in Nagasaki city was; NTT West 48%, Cable TV operator 34%, KDDI 14% and electric company 4% (Figure 5). There is a vigorous competition between multiple facility-based competitors in Nagasaki city compared to Tsu city and Toyama city.

FIGURE 5: Current state of
the local broadband market in Nagasaki city(March 2012)



Local Informatization Policy

In October 2001, Nagasaki prefecture announced “e-Prefecture Nagasaki Strategy ~Informatization promotion strategy~” which embodies measures in the IT field. The strategy “develops IT infrastructure by effective use of existing resources” with several goals established: (1) bridge the digital divide in the disadvantaged area; (2) develop the IT infrastructure in regions where mergers are planned; (3) reduce costs and ensure security of the IT infrastructure used in the field of administration, education, public security and healthcare; (4) economic revitalization and development of local companies. Unlike Mie prefecture and Toyama prefecture, there is no description on the use of Cable network in the strategy. It only mentions to “promote the development of IT infrastructure by private initiative”. Incidentally, although the strategy was revised in 2004 and 2007, there were still no mentions on the use of Cable network.

It should be noted that there is a leased line between mainland Nagasaki and outlying islands Goto, Kamigoshima, Iki, and Tshushima. The leased line is built by borrowing NTT West optic fiber not Cable network. Nagasaki prefecture differs to Mie prefecture and Toyama prefecture in that they do not support Cable TV operators and do not use Cable network to develop their IT infrastructure.

Methods of Developing Cable Network

Nagasaki Cable Media Inc., a pure private Cable TV operator which cover Nagasaki city, was founded in 1986 by taking over the facilities from Kyushu Television Inc. and Nishi Kyushu Television Ltd. Nagasaki Cable Media had to cover the initial investment costs all by themselves because they didn't take advantage of subsidies by the government. However, it is considered that they were able to cut some of their initial investment costs by taking over the facilities from Kyushu Television and Nishi Kyushu Television.

Nagasaki Cable Media didn't make PPP as there was no prefectural guideline to support Cable TV operators or to develop an IT infrastructure by using Cable network. However, although Nagasaki Cable Media had no public aid, they expanded their network to disadvantaged areas and built an interconnection network between other Cable TV operators. Nagasaki Cable Media made an investment in disadvantaged areas by creating a careful thought-out profitability program and did all the planning, construction and sales by themselves. Moreover, they laid an optical cable network called "Omura Bay Network Ring" which connects Saikai city, Sasebo city, Nagasaki city, Omura city and Isahaya city by cooperating with the Cable TV operators in the cities surrounding Omura Bay. "Omura Bay Network Ring" was urged to build by Nagasaki Cable Media and it has become a core network system of the region. A number of local companies are connected to the network.

Management Strategy of the Cable TV operator

Nagasaki Cable Media has adopted the following management strategies.

- (1) Divert the emphasis from broadcasting to telecommunication
Nagasaki Cable Media increased their sales in telecommunication by predicting the decline of TV ratings caused by the tough competition in the TV business, population decline and aging of society.
- (2) Divert the emphasis from personal services to corporate service
Nagasaki Cable Media is able to provide personal service at low cost by doing all the Cable network development planning, construction and sales by themselves. They are attracting favorable comments from the customer too. However, they diverted their emphasis to corporate service on the assumption that business development cannot be expected only by personal services. In concrete terms, Nagasaki Cable Media opened a database center for local governments and small and medium-sized local companies and contracted with the Board of Education to offer a server to all primary and secondary schools in the city for free. In addition to that, they built their own optical cable network based on "Omura Bay Network Ring" which connects Nagasaki prefecture, Fukuoka prefecture, and Saga prefecture. Nagasaki Cable Media broadcasts a shopping channel of a Nagasaki based mail order operator throughout the nation using their optical cable network.
- (3) Advance into foreign markets
Nagasaki Cable Media sends a crew to Shanghai China and produce their own contents. They don't only broadcast it in their community channel, but also sell them to other Cable TV Operators. There are needs for information of Shanghai as Nagasaki prefecture has a long history of relations with Shanghai.

As seen above, Nagasaki Cable Media is developing more profitable businesses.

Features of the Cable Internet User

Figure 6 describes the motives of participation, internet access cost per month and the assessment of cost of DSL users, Cable Internet users (i.e. Nagasaki Cable Media subscribers) and FTTH users in Nagasaki city. While most DSL users and FTTH users point "Because it is a community-based operator" out as a motive of participation, many Cable Internet users point "Because of the low cost (60%)" out. In fact, the Internet access cost of Cable Internet is ¥0 to ¥4,000 and most of the users think it's "cheap" or "a little cheap". It is shown that Cable Internet users in Nagasaki city value the low cost and they are content with Nagasaki Cable Media's price setting.

FIGURE 6: Internet users in Nagasaki city

Nagasaki city	Motives of participation		DSL	Cable Internet	FTTH	chi-square test
		Because of the low cost	35%	60%	30%	0.343
		Because it has been made use of formally	80%	35%	50%	0.19
		Because of the brand and the feeling of trust	35%	0%	20%	0.052
		Because of the rich service	15%	0%	10%	0.724
		Because it is a community-based operator	0%	25%	5%	0.261
	Monthly fee	Internet access cost per month	¥ 2,000 – ¥ 4,000	¥ 0 – ¥ 4,000	¥ 2,000 – ¥ 8,000	0
		Assessment of cost	varied	cheap a little cheap	varied	0

※multiple answers allowed for “Motives of participation”

4. Conclusion

In section 3, current states of local broadband markets, local informatization policies, developing methods of Cable networks, management strategies of Cable TV operators, and features of the Cable Internet user in the case areas were organized by interview research and web questionnaires research. In accord with above, this section will group the case areas in two models and suggest them as an increased facility competition model in the local broadband market. The how and why of the progressed facility-based competition in the case areas are considered as below.

The first model is the “PPP used model”. Tsu city and Toyama city fall under this model. In the “PPP used model”, the prefectural government claimed to develop Cable network as a regional IT infrastructure backbone and supported Cable TV operators to launch stations and expand their service areas. Under such strong leadership of the prefectural government, Cable TV operators drew financial support from national projects and concluded a PPP agreement with local governments. Thus, Cable TV operators were able to enjoy the benefits as follow. First, Cable TV operators were able to built equipments and networks which could deal with NTT in low cost. Second, by a PPP with the local governments, Cable TV operators were able to expand their service area with minimizing costs and risks. What is more, they also won the local resident's trust. Cable TV operators have embarked on a strategy as a “community-based company” by taking such advantages. From the fact that many of the Cable Internet subscribers have cited “Because it has been made use of formally” and “Because it is a community-based operator” as a motive of participation, it is considered that the local residents are appreciating the Cable TV operator's local service and thus Cable TV operators have been successful to differentiate themselves from the competitors by their management strategy which is rooted in the local community. In sum, facility-based competition in “PPP used model” was progressed by the local informatization policy which gave Cable TV operators financial support and advantage to build them into a strong competitor against NTT.

The second model is the “PPP non used model”. Nagasaki city falls under this model. In the “PPP non used model”, Cable TV operator had to develop their network by themselves as there was no financial support from the prefectural government or a PPP arrangement with the local government. Nevertheless, Cable TV operator provides stiff competition to NTT. It is probably because they converted into a more profitable business from an early stage. Diverting emphasis on telecommunication and corporative service and advancing into foreign markets can be given as a specific example. It is also notable that the Cable TV operator is making profits by those businesses and reducing them to individual customers by offering internet access service at lower costs. In fact, Nagasaki Cable Media has been achieved the cheapest internet access cost in Nagasaki city and their price setting is highly praised by the local residents. That is to say, although there was no generous support from the prefectural government in the “PPP non used model”, facility-based competition progressed because the Cable TV operator adopted a

management strategy which focuses on high profitability and succeeded to differentiate themselves from other competitors.

From above, it became clear that the Cable TV operator's management strategy differs by the local informatization policy adopted in the past, and there are two orientations for their management strategy; community-based and profit-oriented. It was also pointed out that each management strategies differentiate Cable TV operators from NTT and increased the Cable Internet penetration, and thus the facility-based competition is progressed. However, both the "PPP used model" and the "PPP non used model" has a problem which was caused by the local informatization policy. Firstly, there are no competitive facility-based operators other than NTT and Cable TV operator in the local broadband market in the "PPP used model". It is considered that an oligopolistic market was formed by the financial support from the government and the PPP with the local government. In addition, the sophistication of the Cable network has been delayed too. It is thought to be aftereffects of the prefectural government and the local government whose fiscal situation has been deteriorating. Secondly, while various facility-based operators successfully entered the local broadband market in the "PPP non used model" unlike "PPP used model", there is a fear that Cable TV operator has a difficulty to fulfill a role as a "community media" because they too much emphasis on profitability. Fulfilling both role as a community media and a facility-based operator is an issue.

This paper showed how and why the facility-based competition progressed in Tsu city, Toyama city, and Nagasaki city and what kind of challenges do they have. Although it is especially focused on the impact of the local informatization policy, this paper would intend to provide a material consideration to review the possibilities and limits of Cable TV operators as a facility-based operator in the local broadband market.

Finally, the author will point out the future developments on this study. This paper offered the "PPP used model" and the "PPP non used model" as a model of an active facility-based competition in the local broadband market. However, in order to construct a more universal model, there is a need to conduct case studies which cover more various areas. A comparative study of areas which has high Cable Internet subscription rate and low Cable Internet subscription rate could be a specific example. In addition, as PPP has been used as an organizing framework in this paper, a depth consideration on the signification of PPP in the field of Information and Communication is one of the challenges for the future research.

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