

Rural BcN Projects for Solving Digital Divide

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Abstract— As the result of serial network advancement projects for the last few decades, the telecommunication network in Korea boasts its fast speed compared with other countries in the world. The data transmission rate of rural areas, however, still remains relatively low, though it is possible for those who live in rural areas to access the Internet. It leads to such a situation that many interesting and useful services based on high speed Internet cannot be used in these areas, unlike in metropolitan cities or in small/medium cities. The digital divide between urban and rural areas may invoke social problems. That is why Korea has started the new project for building FTTx in rural areas from the year of 2010. This paper will cover the Korea government's rural broadband policies.

Keywords—BcN, Rural BcN, Digital Divide

I. INTRODUCTION

The breathtaking development of IT technologies brought the immense of many converged services. Now, it is possible for people to use the converged services anytime and anywhere in a customized way for them. The re-appearance of smart phones and the rapid enlargement of their market share show what can be done with the most advance IT technologies. The expectation and the desire for those converged services are increasing, so it necessitates the faster network service speed at the same time.

The Korea government has conducted a series of projects to build the network infrastructure of high speed, to provide various converged services, and to encourage the Internet service providers in Korea to invest IT-related researches [1]. The result of the series of government-driven projects is quite successful, so Korea is considered as one of the top IT countries in the world [2]. The recent project has concentrated on laying a foundation for universal broadcast and communication convergence services by expanding broadband broadcast communication networks [3], but it results in the situation in which broadband networks are concentrated in cities, not in rural areas, according to the density of population.

In order to solve rural areas' economic, social and cultural issues and to vitalize the economy and industry, it is necessary to diffuse and spread specialized services based on broadband broadcast-communication networks in rural areas.

Constructing broadband broadcast-communication networks is the key to solve those problems; it is also needed to establish a nation-wide and inter-ministerial co-operation sys-

tem. Local governments and carriers should be involved in the co-operation system, too.

To accelerate the network speed in rural areas which has been slower than that in cities, a series of development projects of the Korea government had been conducted since 2006 [4, 5].

From 2002 to 2005, through the construction of high-speed networks in rural areas of more than 50 households, high-speed Internet service came to be provided to 3.53 million households, 94 percent of all rural households. From 2006 to 2008, through the construction of high-speed networks in rural areas of less than 50 households, 3.76 million households, 99.7 percent of all rural households came to enjoy high-speed Internet service.

Though the previous high-speed network development had ended quite successfully, the change of service model of ICT requires more network bandwidth than ever. To satisfy the request in rural areas, the Korea government began to build broadband networks in rural areas since 2007, and one dedicated plan called Long-term Plan for Constructing Broadband Network in Rural Areas was made and announced by KCC (Korean Communications Committee) in 2009 [6]. The final version of was announced by the Korea government in June 2010 [7, 8]. In this report, more goals were identified and tasks for achieving the goals were clarified.

In this paper, we analyze the goals and the executive strategies of the long-term plan for BcN in rural areas, and discuss the implications of the goals and strategies.

The paper is organized as follows: in Section 2, the status of current IT infrastructure in rural areas is analyzed, and its implications are discussed. In Section 3, we represent the objectives of Rural BcN development plan. The goals and dedicated strategies are analyzed and discussed in Section 4. The conclusion will be drawn in Section 5.

II. ANALYSIS OF STATUS AND PROBLEMS

In this section, the status of current IT infrastructure in rural areas is analyzed in terms of network infrastructure, and supported IT services.

A. Network infrastructure

As of December 2009, 3,925,866 households, that is, 20.4 percent of the whole 19,261,292 households in Korea lived in rural areas, and 450,061 households, 11.5 percent of the rural households lived in small villages of less than 50 households.

The population and generations of rural communities have been diversified largely due to accelerating reduction and aging of population and increasing multi-cultural families. The population over 65 years old in rural areas is expected to increase continuously. While the rate of senior citizens in rural areas was 18.6% in 2005, the rate is estimated to be 22.9% in 2014. Foreign wives in rural areas are expected to increase. The number of foreign wives was 45,000 in 2005, and increased to 70,000 in 2008. The number will be expected to be 115,000 in 2014.

As of 2008, the construction of high-speed networks, including broadband networks was completed for 3.76 million households (99.7%) out of 3.77 million rural households in the country.

Carriers are actively promoting the construction of broadband networks in rural areas, especially in apartment complexes of high residential density, but they are reluctant to invest in areas of small size or medium size where residential densities are too low to regain the investment costs quickly. In particular, broadband networks do not exist in areas of less than 50 households, in which carriers avoid investing due to lack of economic feasibility. Only 64 villages out of villages of less than 50 households have been equipped by broadband networks in 2010. All of those villages are in Busan Metro-City and Daegu Metro-City.

B. IT Services

The construction of high-speed networks has contributed to narrowing the information access gap between rural residents and the general public, but the gap of skills for using Internet services and the Internet usage gap have rarely narrowed.

The digital divide index is a measurement of information access gap, which is calculated by subtracting the informatized level of rural residents from that of the general public (supposed as 100). The survey of 2009 reported the digital divide indices in terms of 4 factors. The biggest value is the skill gap (64.8). It is followed by the quantitative usage gap (54.2), the qualitative usage gap (60.5), and the access gap (15.9).

Most of the IT services provided for rural villages are simple Web-based information provision services. So it is needed to actively utilize broadcast-communication networks in rural areas. Some IT services based on IPTV and DTV are being provided for rural areas. For example, the cyber home learning service is provided by the Ministry of Education, Science and Technology. The agriculture management information service, and the production and distribution information service are provided by the Ministry for Food, Agriculture, Forestry and Fisheries.

However, these are one-directional information provision services, so it is needed to enhance them into bi-directional customized services. With bi-directional services, users' demands will be reflected immediately, and carriers and users can exchange information in an interactive way.

III. OBJECTIVES OF RURAL BCN

The first objective of rural BCN project is constructing economical, efficient, and nationwide broadband broadcast-communication networks. This objective can be viewed in three difference perspectives.

First of all, the early construction of nationwide broadband broadcast-communication networks should be achieved. Voluntary competition of the private sectors and the government support for non-competitive areas should be properly combined for this purpose. The construction of broadband network must use current communication resources effectively with preventing carriers' duplicate investment. The government should reform and keep the system effectively, for example, by eliminating obstacles to the construction of broadband networks.

To maximize the benefits and effects of the rural BCN project, the project itself should be exercised on the basis of actual demand. We suggest that the following 5 items should be implemented based on actual demand.

Constructing networks and providing services should be designed and implemented based on rural residents' actual demand. Favorable conditions for increasing the use of services should be created based on the characteristics of rural communities. A nationwide cooperation system and the industry's ecology should be created, and the synergy between the governmental ministries and the industry must be derived from the co-operation system. The policies and projects of the related ministries and government agencies should be integrated. In order to achieve this goal, a co-operating system of these bodies must be built, and a cooperative body for promotional and educational purposes should be also organized.

IV. EXECUTIVE PLANS FOR RURAL BCN

In order to construct broadband networks and create an environment for increasing the use of broadcast-communication convergence services, executive plans for rural BCN are given in four fields: network infrastructure, service accessibility, customized services, and political and economical support. Figure 1 depicted the four executive plans and their sub-goals.

A. Network Infrastructure

To construct broadband networks in rural areas, broadband networks in small rural villages (less than 50 households) will be built by 2016. The financial support will be given by the government, and the central government, local governments, and carriers share the costs in the ratio of 1:1:2.

For the broadband network construction in medium-sized rural villages (more than 50 households), the efficiency of the broadband network will be increased. The construction of broadband networks in medium-sized areas (50-240 households) will be completed by 2012. This construction will be supported through efficient policies, for example, inducements to carriers to divide construction projects among themselves or construct networks jointly.

Broadband networks in remote islands and isolated areas will be built, too. Remote islands and isolated areas are considered as places where new wired networks cannot be con-

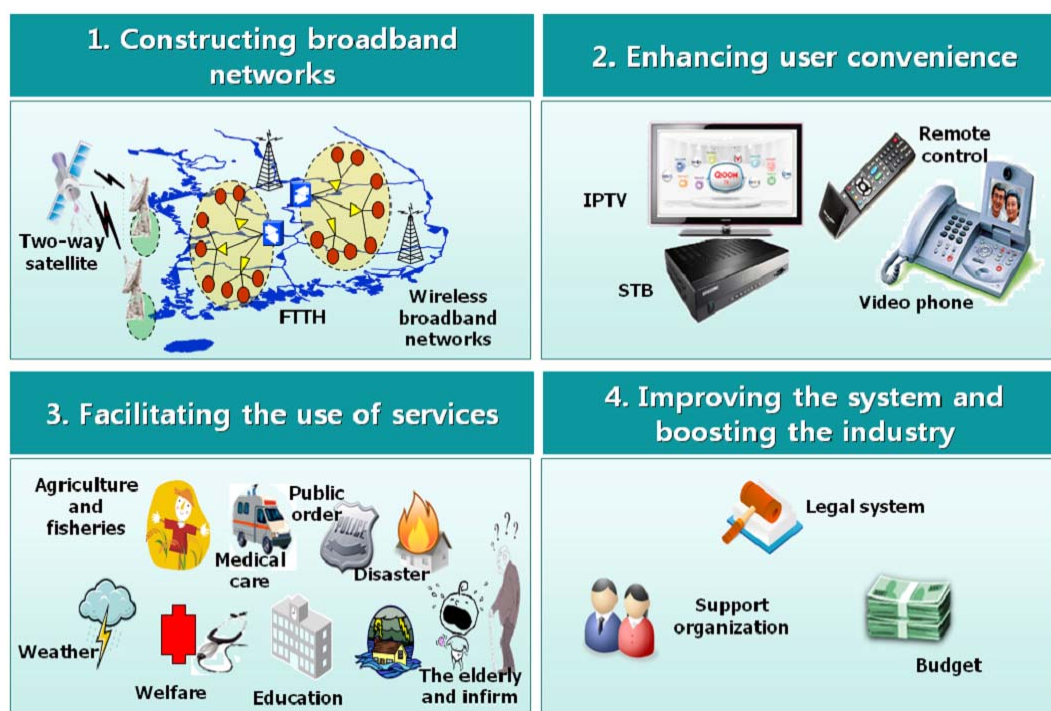


Figure 1. Executive Plans for Rural BcN [8]

structed. For these areas, a foundation to provide broadcast-communication convergence services will be made by considering and applying various alternatives.

The use of wireless networks such as 4G will be tested for rural areas. o Building Test beds for wireless ultra wide-band networks in small rural areas that have no broadband networks will be built, and the possibility that they will replace fixed broadband networks will be verified. The government is trying to rent optic fiber cables of Korea Electric Power Corporation in rural and isolated areas can be considered as another option, but it requires the governmental involvement in the process of mediation and negotiation. Pilot projects will be promoted to verify other wireless technologies such as WiFi Mesh, WiBro. Services through a two-way satellite will be provided for areas where other alternatives cannot be applied.

B. Service Accessibility

Terminal guidelines for rural residents will be developed and provided. The guidelines will facilitate the use of broadcast-communication convergence services in rural areas by eliminating the complexity of using the terminals.

Developing UI enhancement and design solutions for rural villages will be supported as a part of rural BcN plan. The enhanced UI and design solutions will encourage rural residents to use broadcast-communication convergence services by developing UI enhancement and design solutions.

Remote customer support solutions will be provided and tested. Inconvenience of rural residents in using the services will be resolved on-line through remote customer support. At the same time, various measures to support rural residents will be developed.

C. Customized Services

A system for connecting and integrating IT services for rural areas will be implemented. Existing services for rural areas will be enhanced into broadcast-communication network-based specialized services. To maximize the synergy, an inter-ministerial cooperation body will be established. The cooperation body will help connect and converge the services for rural areas among different IT services.

Identifying specialized Customized services for rural areas will be identified and pilot projects for these identified services will be promoted. Services such as IPTV and video telephone will be customized for rural communities, and they will be serviced in broadcast-communication network through pilot projects.

To increase the use of services, promotional and educational activities will be conducted. Through effective promotion and education, the usage rate of the services will be increased.

A survey on the use of services, including customer satisfaction, will be conducted regularly. The survey will be used as a basis for building a virtuous cycle of demand analysis, service development and provision, customer satisfaction study, and increase in usage rate. This service development cycle will help increase the usage rate of the development services.

D. Political and economical support

Developing a system for supporting carriers In order to encourage service carriers to construct broadband networks efficiently, a supportive legislation for carriers will be enacted. Carriers will be encouraged to voluntarily invest in building broadband networks in non-competitive rural areas by reform-

ing laws and regulations that deal with the construction of broadcast-communication infrastructure and developing a support system.

Policy and institutional supports for facilitating the use of services will be provided. The use of services will be facilitated by organizing and operating an effective body that promotes and supports the projects, and developing a reasonable and affordable tariff plan for specialized services for rural areas.

The broadcast communication industry's ecology to boost the local industry in rural areas will be established. A basis for sustainable development of rural areas will be founded, and the opportunity to grow together will be offered to the related industries by establishing an ecological system that promotes a virtuous cycle.

V. CONCLUSION

As the result of serial network advancement projects for the last few decades, the telecommunication network in Korea boasts its fast speed compared with other countries in the world. The data transmission rate of rural areas, however, still remains relatively low, though it is possible for those who live in rural areas to access the Internet. It leads to such a situation that many interesting and useful services based on high speed Internet cannot be used in these areas, unlike in metropolitan

cities or in small/medium cities. The digital divide between urban and rural areas may invoke social problems.

To cope with this problem, the Korea government began to build broadband networks in rural areas since 2007, and one dedicated governmental plan called Long-term Plan for Constructing Broadband Network in Rural Areas was made and announced in 2009. The final version of this plan was announced by the Korea government in June 2010.

In this paper, we analyzed the goals and the executive strategies of the long-term plan for BcN in rural areas, and discussed the implications of the goals and strategies.

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