DIGITAL DIVIDE AND RURAL AREA INFORMATION SYSTEMS IN CHIBA, JAPAN

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In Japan, Internet is widely used for the people, and the connection environment with low-cost and high-speed is established. However, in the low-density population areas, such as rural or mountain areas, only low speed connection facilities can be used. High-speed access infrastructures are available only in population concentrated areas. In this paper, I focused to study Chiba prefecture. It has 80 municipalities (cities, towns and villages.) To determine the economic and agricultural situations of these municipalities, I performed a principle component analysis. With this analysis, all municipalities grouped three categories. And digital divide has found between economical developed grobup and agricultural developed group. However, if the Internet is as it is said to be "the most democratic tool", the gap should not to be broadened. And to achieve the sound development of our country, the gap should be eliminated. Therefore, in this paper I referred some movements to support for conquering the digital divide, and to equalize the access costs in rural area, as those in city area.

Key Words: Rural Area Network, Digital Divide, Principle Component Analyses, Broad Band Access.

1. Background

In Japan, number of the Internet users has reached 56 millions which means the penetration rate is 44 %, based on 2001 survey1). Broadband access users are also increasing very rapidly, and reached to 3.8 millions by the March 2002. The IT is also spread to the local governments, such as web sites for municipality's services. The penetration rate of web site is 88 % for the Japanese municipalities (such as cities, towns, and villages.)

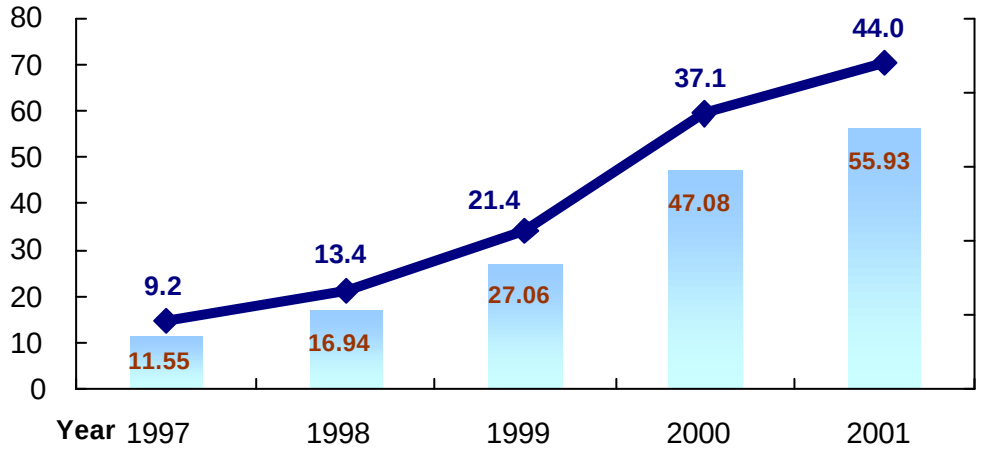

Figure.1 Trend of the Internet Users in Japan. (Source: White Paper 2002[1)])

And IT is also used at agricultural fields. Modern agricultural production is performed with full use of information, such as weather forecast, pest data, insect data, soil data, market data and so on. In Japan, the direct marketing from the farmers to the urban consumers is well established. For this purpose, farmers want to provide their product information to their customers. And they want to communicate closely not only people who bought their products, but all consumers. So, high-speed and full-time connection is also required in rural area.

But, while the Internet develops, existence of digital divide has also surfaced. The rate of Internet users is lower in the rural area compared to the city area. And Internet access points are mainly situated in the urban area, not in the rural area.

In this paper, I tried to classify all of Chiba municipalities (cities, towns and villages) into several categories. There must be some economically developed municipalities and under-developing ones. Unfortunately this economical growth and the development of the communication infrastructures is highly related. But some municipalities are exception of this relationship.

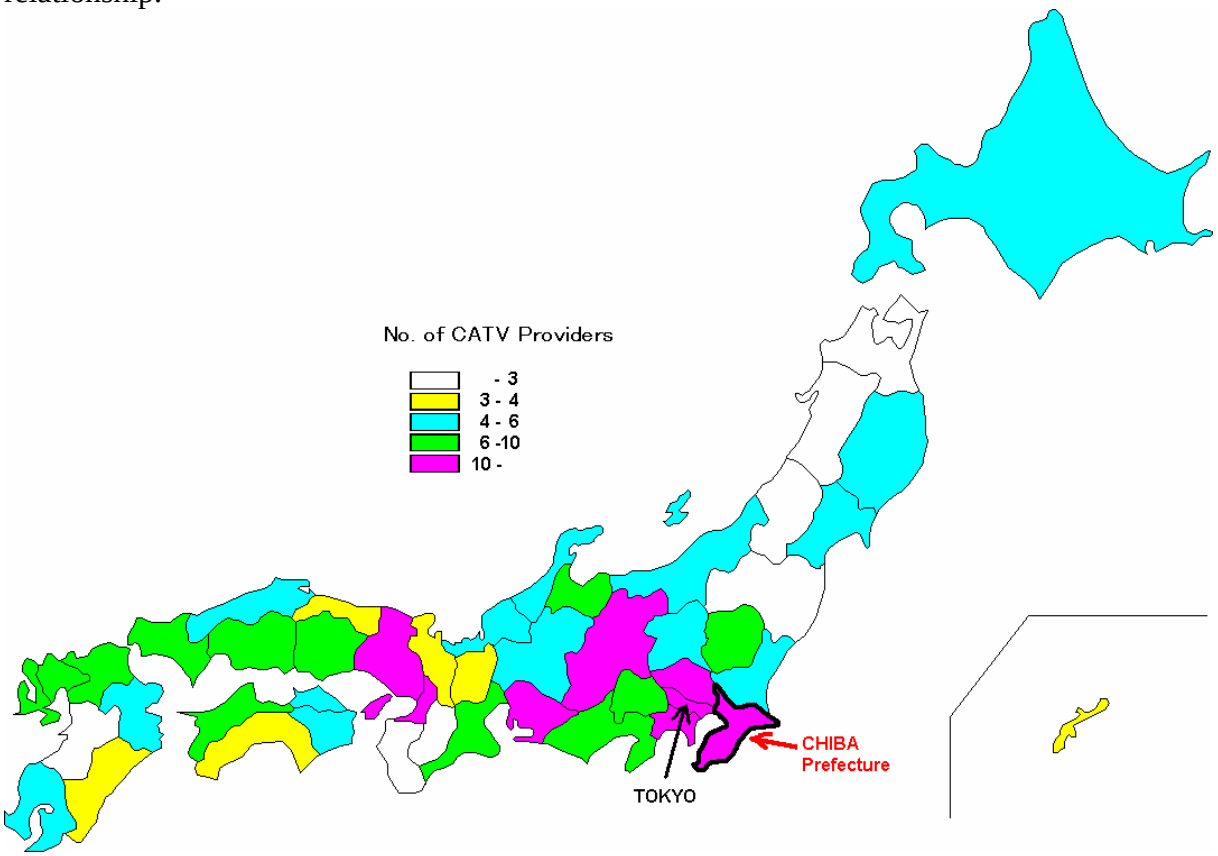

Figure 2. Number of CATV Providers in JAPAN: CHIBA and Tokyo

2. Categorize the municipalities in Chiba

Chiba prefecture is situated in Kanto area and next to Tokyo metropolitan. The population is almost six millions. There are 80 municipalities in Chiba area. In order to categorize municipalities, I used the principle component analyses with 16 statistical data (Table 1.)

Table 1. Statistical data for principle component analyses[2)]

No	*Name of the variables*	**Weight of the 1st component**	**Weight of the 2nd component**
1	Area	0.397	0.808
2	Population	0.737	0.306
3	Ratio of young generation	0.375	-0.212
4	Ratio of adult generation	0.940	-0.237
5	Ratio of aged generation	-0.918	0.266
6	Agricultural products	0.356	0.583
7	Municipality budget per capita	-0.574	0.039
8	Number of students per teacher	0.875	-0.219
9	Ratio of passport issue	0.824	-0.354
10	No of Farmers	0.370	0.812
11	Ratio of owning house	-0.823	-0.108
12	Ratio of sewage	0.850	-0.234
13	Number of convenience stores	0.717	0.372
14	Number of medical doctors per capita	0.069	0.314
15	Ratio of traffic accident per capita	0.254	0.264
16	Number of local Internet access points	0.874	-0.283
Accumulative Contribution Rate (%)		45.93	61.84

From the analyses, primary component has identified; that is an economical measure. And the second is rural or agricultural measure. The 16th term, Number of local Internet access points, is positive (0.874) for the first component, and negative (-0.283) for the second. Values for these two components has plotted on Figure 2.

Number on the Figure 3 represents the name of the municipalities; i.e. No. 1 is Chiba city, which is the capital of Chiba prefecture. Chiba city is huge and includes not only urban area, but also agricultural area. So, both Z1 (1st component) and Z2 (2nd component) values are large. It has also happened on No. 19, Ichihara city, and No. 25 Kimitsu city. I categorized them to GEA (stands for Group both, Economically and Agriculturally developed.)

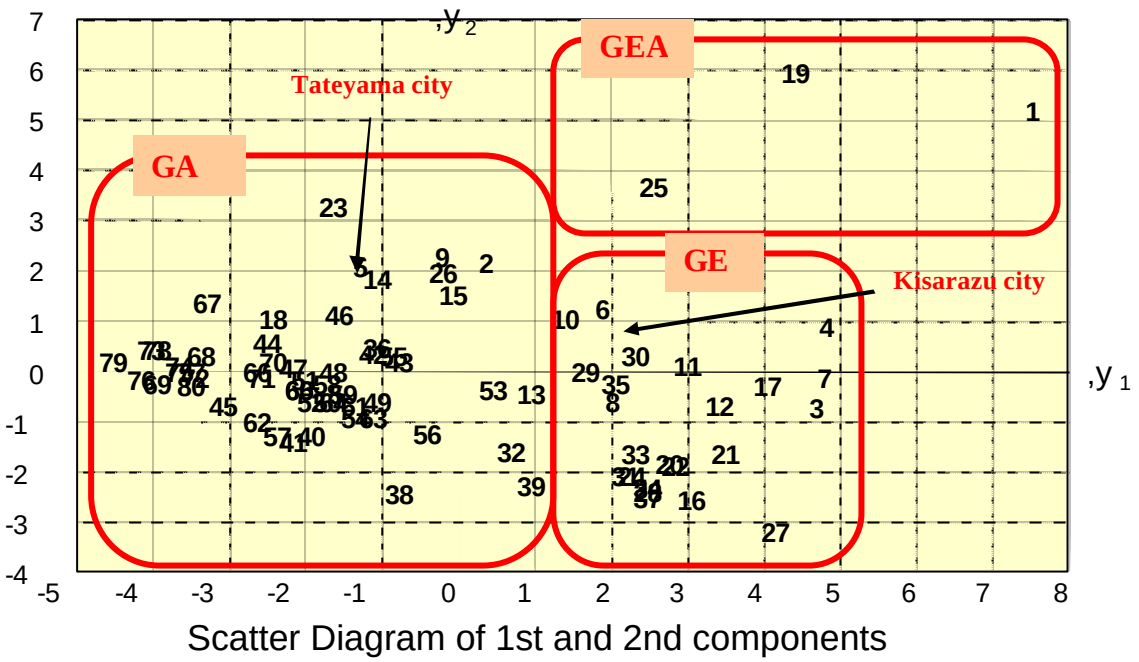

Figure.3 Scatter Diagram of 1st and 2nd components

No. 27, Urayasu city, has a big Z1 value and the smallest Z2 values. This city is located next to Tokyo metropolitan, and lack of farmland. Small Industrial factories and flats for Tokyo commuters mostly cover the city. I categorize such cities to GE (Group of Economically developed). They have higher Z1 values and smaller Z2 values; No. 4, Funabashi City, No. 7 Matsudo city, No. 3 Ichikawa city are typically in these category.

No. 23 Kisarazu city and No. 67, Otaki town are representatives of the category GA. (Group of Agriculturally developed). These areas are far from both Tokyo metropolitan and local capital Chiba. So, they have smaller value of Z1, which means economical situation is not so good. But, some factors are good, such as number of students per teacher is small, doctors has smaller number of people and ratio of house owners is bigger.

The number of Internet access points varies from 15 in most rural area to 110 at Chiba area. And the broadband accesses, such as xDSL services are still not available in most rural area. FTTH (Fiber-optic To The Home) service is currently available at 20 cities. They are GEA and GE cities. No GA cities are included

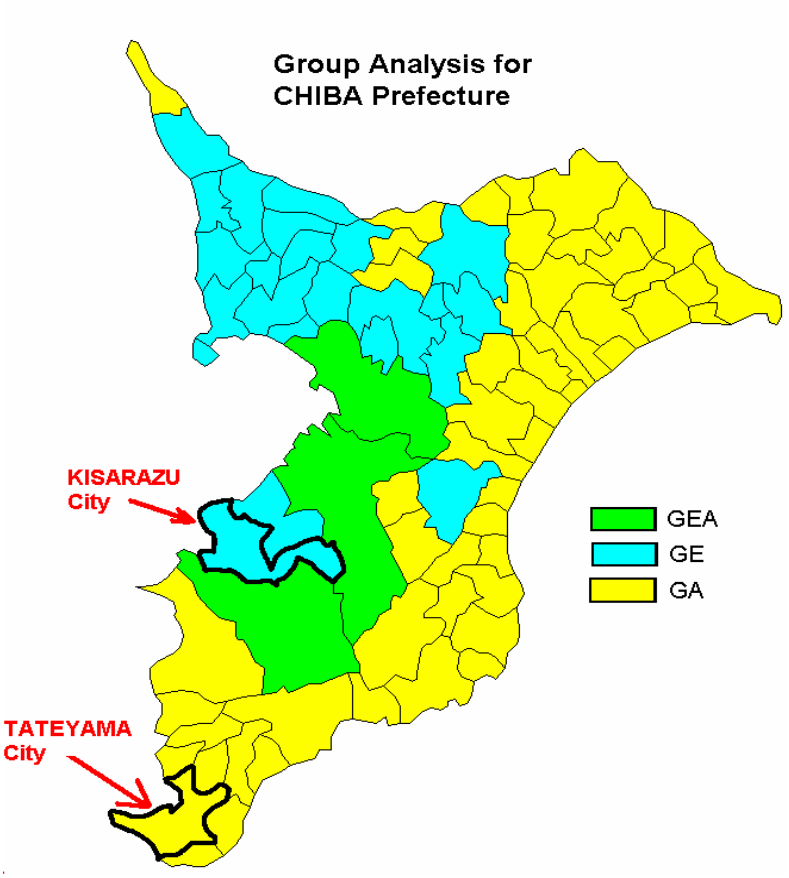

Figure 4. Groups of CHIBA Miniciparities.

3. Rural Area Information Systems

3.1. Tateyama City[3)]

Tateyama city, No. 5 and classified GA, launched IT policy, which aims to facilitate for all citizens equal access to the Internet. In order to achieve this policy, the city government provides communication infrastructures. Table 2. shows the current equipments which are under operation of Tateyama Internet Conference (Association) which is NPO (Non Political Organization.) The budget is partly subsidized by the Tateyama city. This NPO provides Internet connection for all public schools in Tateyama cities. With this organization, even in the rural area in Tateyama, citizens can use high-speed connection with low-cost.

Table 2. Facilities of Tateyama Internet Conference (Association)

	Back-bone of Tateyama Internet NOC Fiber Optics to TT-net (3Mbps & 1.5Mbps)
	Dipole Antenna for Wireless Internet Connection IEEE802.11b (11Mbps)

3.2. Kisarazu City

Kisarazu City, No. 6, is classified to GE. But currently economic situation is not good. Last year, at the Kisarazu city, an experimental project named "Kisarazu Mobile Town Initiative4)" has started. This project is operated by a university student with Kisarazu city financial support.

The project utilizes wireless technology to support citizens of free access to the Internet. It is now operated only at the station buildings. But the project aims to cover wider area of Kisarazu city, especially whereas commercial provider will not support. If the initiative will success, all citizens in Kisarazu city can enjoy low cost connection.

4. Conclusion

Though the Internet is said to be "the most democratic tool," the digital divide "DOES" exist. If we sincerely hope the sound development of our country, this gap should be eliminated. But, if we leave this situation to the commercial economy, the gap will be broadened.

Some movements like Tateyama city and Kisarazu city are very interesting. But, both project have financial difficulties. I must say such equal opportunity to the Internet access must be opened to the public. It is become a very important role for the local government.

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