Research on Ubiquitous Rural Environments (U-Rural)

Dr. Sang bum Kim, Dr. Sang Young Rhee
Rural Development Administration
Yong Wook Kim
University of Illinois at Urbana-Champaign

1. What is Ubiquitous?

1) Definition

Ubiquitous Means 'existing' in Latin language. Ubiquitous is a network that can be presented in any place at anytime at a certain point by using not only network PC but also non-PC appliances, like mobile phone, TV, game console, a hand-held terminal, automotive navigation system. By networking PC & non-PC appliances, anyone can access on anywhere, anytime without any difficulty of high traffic network with low price.

In other words, ubiquitous is a technology that users can easily access without feeling any difficulties in our daily lives without noticing it, just live breathing in our daily lives.

2) Ubiquitous Technology

Revolution in agriculture, industrialization and in information technology, ubiquitous is forming a new paradigm. Not only does it forms innovated

technologies but also harmonizes objects in reality and imagination. Following are how ubiquitous is applied;

<Table 1> Ubiquitous technologies.

Distribution.	Contents
Electronic Tag	Be representative, and can give a large effect to a physical distribution management like logistics as use tag technology by RFID. Using sensor technology and a grasp can call things or a human location, and trace things move, and be prompt, and can react.
Network	A network like IPv6 shall be established, and can connect various appliances, and can be made control. This is a network base for communication which substitutes IPv4.
Middleware	User need program that control various devices which is middleware technology. User need program that control various devices which uses middleware technology.
Interface	It is necessary technology that communication is established with each device. May make a language, and interface of the form that a user can easily connect other devices, and operating system. Be currently proceeded a HCI (Human Computer Interface) researcher regarding this.
telemetric	The integrated use of telecommunications and informatics which more specifically it is the science of sending, receiving and storing information via telecommunication devices in the car.
Intelligent home	Smart Home called intelligent-type home (Smart Home, Digital Home) that is future concept of home which avoid natural power like wind and rain. It is serve that home security, amenity, convenience and amenity by various service network devices.

3) Characteristics of Ubiquitous environment.

Characteristics of various technical U- communication environments to be applied are as follows.

- The computer network exist everywhere but humans do not know (Disappearing computing).
- Continuous computing network (seamless computing).
- User-centric environment
- The actuality that I was built up (augmented reality).
- Intelligent awareness of whether or not there are with the veins things (context-awareness).

2. Ubiquitous in Korea

1) U-Korea

A. IT infrastructure of a greatest in the world level.

- On Internet availability ratio world 2 ('04.1 2): 31,580,000 people, Population provisions 65.7%.
- On super high speed Internet ratio of distribution world 1 ('03, IT U): 11,920,000 people, household provisions 77% ('04.1 2).
- 36,250,000 cellular phone diffusion rates, population provisions 76% ('04.10), American 53%, Japanese 62% ('03).

B. Evaluation of the world regarding a Korean informatization level.

- Alvin Toffler: Korea is one of the best countries that has IT infra There is not yet a model for Korea to follow in the third waves ('01.6).
- ITU report: Korea's information & communication development in last 40 years is a miracle ('03.4).

- New York Times: Korea has achieved, America's dream of super high speed Internet. US government should used this as a model to emphasize more in IT infra. ('03.5).

- Fortune: Korea will be one of powerful country in IT technology putting US aside. Digital world, Korea is amazing. ('04.9)

C. E-Korea. Strategic U-Korea

Society-based information (The third wave)
Intelligent-based society (The fourth wave)
Ubiquitous society = Society-based information
+ Intelligent-based society

- Ubiquitous, connecting people and objects. Simply connects anybody, anywhere at anytime they want. Connects men to men and objects to objects. By transplanting computer chips to objects, embodies harmonized environment between reality and virtual space.

- IT839 strategy: Eight service (such as Wibro, DMB, and Home network.), three infrastructures (such as BCN, RFID/USN, IPV6.), Nine Growth powers (such as an Home Network, RFID/USN, IT SOC, intelligent-type robot, next generation PC, Embedded SW, Digital Contents etc.)

<Figure 1> Ubiquitous Korea's Strategy

2) U-City & U-Rural

The development of 'U-City' is being discussed. U-City features technologies ubiquitous to location differences inside urban areas. These technologies include broadband convergence network, radio frequency identification, ubiquitous sensor network, home networking, Wibro, digital multimedia broadcasting, telemeters, geographic information systems, location-based systems, and smart card system and video conference technologies, among others. The main feature of U-City is that users can get services anywhere, anytime according to their needs. U-Rural is the extension of U-City to rural settings. U-Rural features technologies ubiquitous to location differences outside urban areas - in rural settings; so that U-City services are also available to rural communities anytime, anyplace on an as-needed basis. The medium might be technology, but what these technologies will deliver are the amenities (employment, health care, entertainment, etc.) that draw people away from rural areas and to cities. As a result, rural areas may be less likely to decline.

<Table 2> U-Rural and U-City

Distribution.		U-rural	U-city
Common point.		Be application technical Ubiquitous to a local community.	
Difference.	Object.	An agricultural village, a fishing village, a mountain village.	Urban areas
	A primary viewpoint.	Information difference solution.	Be royal mausoleum efficiency for going insane.
	Concept.	Be application technical Ubiquitous in primary industry and life environment. Promote productivity and the quality of life.	A space, things, a person action connect.
	Purpose.	Information difference solution. Productivity improvement. Culture, a welfare level elevation.	Develop to a convenient city. Be local innovation by strategy business activation.
	Infrastructure.	IT infrastructure weakness	IT infrastructure strength
	Establishment.	Investment shortage Local financial lowness.	Investment formation. Finance is efficient.
	Level	Be relatively IT service lagged behind.	IT service high relatively.

3. Future of Ubiquitous

1) Future of Ubiquitous

All things which are accessed to network will be strong PC in the future. Terminal possession concept is meaningless under u- computing environment. Even if an expert in network computer tries to use other person's u-computing, smart u-computing will recognize its owner's

fingerprint, pupil and handwriting and will perform their duties without any mistake.

- 'Computing Everywhere' to come true.
- Ubiquitous computing aims at 5any of 5c.

Computing (Computing), a communication (Communication), access (Connectivity), contents (Contents) are calm (Calm), and 5c rises, and the 5ANY any network (Any network), which appliances even (Any device) speak wherever (Anywhere) what service even (Any service) when (Anytime).

Lately, we can easily see that we are stepping into Ubiquitous computer age with our current technology.

<Figure 2> Ubiquitous computing aims at 5any of 5c.

2) Ubiquitous Globalization

Future world, with high capacity and diversity, by controlling heavy environmental load, human spaces should be comfortable and cheerful to live in. Counties will form nature friendly residential district and 24 hours city zone. A high-speed network will connect each other from different

world to be able to work together even though they are in different time and space zone.

Cooperative work between two or more different zone becomes possible through artificial screen, imaging that counterpart is close to you. Numerous computers will be used but will be invisible to humans in order to make comfortable and convenient environment in human lives.

By this way, u-globalization can be established though connecting intelligent-type nations and its network.

<Figure 3> Ubiquitous Globalization.

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Primary Author

Dr. Sang Bum Kim

Rural Development Administration

88-2 SeoDun-Dong, KwonSun-Ku, Suwon, 441-853, KR

82-31-299-0511

kimsb@rda.go.kr

Co-Author

Dr. Sang Young Rhee

Rural Development Administration

88-2 SeoDun-Dong, KwonSun-Ku, Suwon, 441-853, KR

82-31-299-0530

syrhee@rda.go.kr

Yong Wook Kim

University of Illinois at Urbana-Champaign

111 TBH 611 Taft Dr, hampaign, IL 61874, US

217-265-6341

ywkim@uiuc.edu