

# **U-Korea, U-Japan, U-Fever**

*The ubiquitous “u” in Korean and Japanese  
Information and Communications Technology*

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# 1. U as in Ubiquitous: Why Bother?

The firstcomer to Korean or Japanese information and telecom technology (ICT) will immediately notice the u-words. They are sprinkled all over presentations, descriptions, and reports. There is *u-Korea*, *u-Japan*, to begin with. Other than that almost every aspect of life seems to have its u-version: *u-city*, *u-home*, *u-tourism*, *u-business*, *u-government*, to name a few. There is an *ubiquitous economy* and the *ubiquitous society*. Finally, to sum everything up, there is *u-life*.

In short, the letter “u” seems to redefine human existence. What is the vision that so affects life that many of its aspects are transformed to a “ubiquitous” counterpart?

The fact that this happens in Korea and Japan should make us attentive. These countries are hothouses of ICT development.

This report is written by a European mainly for other Europeans or Westerners. Its main conclusion is that, for the word *ubiquitous* you cannot always trust your dictionary. There is a u-language that it pays to master in the dynamic world of East Asian ICT.

## Terms and Abbreviations

The following terms and abbreviations are used in this report.

ICT	Information and communications technology
IT	Information technology

Markers in the style of [ABCyy] are references to the bibliography at the end of the report.

Unless stated otherwise, all references to Korea in this report refer to the Republic of Korea, also commonly known as South Korea.

## Overview

Most chapters end with a summary.

Chapter 1 (this chapter) is an introduction to the subject.

Chapter 2 traces the roots and development of the concept of *ubiquitous computing*.

Chapter 3 describes the use of *ubiquitous* in official language in Korea and Japan.

Chapter 4 plunges into the Korean and Japanese languages to trace *ubiquitous* as a loan word. A new translation is suggested.

Chapter 5 is a summary of the report.

## 2. Ubiquitous Foundations

The word *ubiquitous* is key to this report. This chapter traces the origins of the *u* word and how it became linked to information technology.

### Dictionary Lookup

The “u” in u-words like *u-Korea* and *u-Japan* stands for *ubiquitous*. The dictionary meaning of this word is,

found or seeming to be found everywhere; ever-present [from Latin *ubique*, everywhere] (*Chambers English Encyclopedic Dictionary*)

This simple word has come to be heavily overloaded with high tech connotations in Korea and Japan. We will begin by following its tracks from plain English into ICT.

### The Information Technology Scene

The *u* word entered the ICT realm when Mark Weiser and others coined the term *ubiquitous computing* at the end of the 1980's.

Mark Weiser (1952-1999) was a chief scientist at the renowned Xerox Palo Alto Research Center and is widely considered to be the father of ubiquitous computing. The article [WEI91] appearing in *Scientific American* marks a point where the concept had been established among computing specialists, and ready to be brought to a wider audience.

Ubiquitous computing may be defined as

a post-desktop model of human-computer interaction in which information processing has been thoroughly integrated into everyday objects and activities [UBI08].

This means you reap useful results from computers without thinking about yourself as a computer user.

### **Illustration: The Electric Motor**

There is a parallel with the electric motor. A hundred years ago an electric motor was a high-tech object. Using one required special skills. The bearings had to be oiled, the brushes adjusted. Electric motors were often quite visible, both physically and in advertising electrically powered products.

Today an ordinary kitchen may contain a dozen electric motors. The dishwasher, the microwave oven, even the CD tray in the kitchen stereo set are operated by electric motors. The big difference is that they have gone out of sight, physically and mentally. We cook, play music, whip the cream and have the dishes washed, all without paying the slightest attention to

electric motors. A dishwasher ad would never mention its electric motors. In short, the electric motor has become *ubiquitous*.

### ***How Close is Ubiquitous Computing?***

Back to our topic: computers. How ubiquitous are computers today?

In fact, modern versions of the kitchen utilities just mentioned are controlled by computers. Those computers are simplified, scaled-down counterparts of what we normally call a “computer”.

When you drive a modern car, dozens of computers come to your aid without making themselves known.

Thus computers have definitely entered everyday activities and objects. A computer is no longer necessarily a beige box with a screen and a keyboard. Advertising for products like kitchen utilities or cars do not mention the computers hidden inside. The vanishing of computers is a clear sign of ubiquity.

However, Weiser had one more criterion for ubiquitous computing: *communication*. In his vision computers communicated, dynamically interconnecting to each other as the situation required. Our microwave oven and dishwasher may be computer controlled, but they do not communicate. Neither does the average car just yet.

### ***Communication Technologies***

At the time Weiser and his colleagues made their early experiments the Internet was mostly the domain of academics and specialists. The World Wide Web still awaited its invention. People communicated over the Internet by email and file transfers.

For short range communication Weiser used infrared light, the only technology inexpensive enough for ubiquitous use. This is the same technology as in remote controls.

We could also remind ourselves that the first handheld mobile phones were just appearing back then. Handheld did not mean pocket-size. Mobile telephony systems were still largely analog.

The development of digital communications during the last 15 years has been nothing less than revolutionary.

Today the World Wide Web has penetrated most aspects of modern life. The number of mobile phones globally is counted in billions. Inexpensive digital radio technologies like Bluetooth [BLU08] or ZigBee [ZIG08] is commonly used for short range cable replacement and networking. Their capacity leaves infrared far behind.

The remarkable development of digital communications sets the stage for fulfilling the vision of ubiquitous computing.

## Summary

The term *ubiquitous computing*, as it was formulated by the end of the 1980's, is a vision of computers being everywhere, permeating daily life, but without being noticed as “computers”.

Even if the vision has come true in many ways, a vital characteristic has been largely missing: communication. However, the rapid development of digital communication makes ubiquitous computing feasible today, technically and economically.

## 3. Official Language

Japan and Korea both have ambitious national ICT strategies. Both have picked up *ubiquitous* as a key concept. In fact, their current ICT strategies are centered around this term.

The national ICT strategies are evaluated and revised from time to time. This chapter begins a few years back to trace how u-words first appeared and then became part of the official language. A hurried reader may postpone the retrospective part and proceed directly to the summary at the end of the chapter.

Looking back, let us remind ourselves of the era preceding the “u” age.

### From “e” to “u”

Before the “u” (ubiquitous) era, there was the “e” (electronic) era. The “e” era is a global phenomenon. “E”-words like *email* have become part of everyday English. The term *e-government* is used internationally and will probably remain part of the world-wide vocabulary. Another “e”-word in common use is *e-commerce*.

The “e” prefix represents the notion of digital communication replacing physical paper transport. Email for exchanging personal messages paved the way for e-commerce and e-government. Digital documents came to be recognized as real documents.

Computers were first used to help compose and print the paperwork necessary for governmental and commercial transactions. In the “e” era the digital format *is* the document without necessarily being printed. New methods have been developed to replace the seals, stamps, and signatures traditionally used for legally binding communication.

The “e” era is in varying state of progress, transforming societies all over the world. Japan and Korea are unique in their explicit transition to the “u” era.

## Japan

The first Japanese national ICT program was launched in 2001. Its title was *e-Japan Strategy* [JAP01]. Its focus was *the knowledge-emergent society*. Despite its title this document contains no e-words. There are no u-words either, but the idea of a ubiquitous network is quite clear. The strategy envisages an information infrastructure with the following characteristics.

1. Available at any time, anywhere and to anyone,
  2. a great variety of choices and services,
  3. safe, easy and secure,
  4. affordable, high-speed and efficient, and
  5. indiscriminate regardless of nationality and consistent with global standards.
- [JAP01]

This view has turned out to survive many other changes in ICT strategy.

The Japanese IT Strategy Headquarters launched a second phase of the national ICT program in 2003. It was entitled *e-Japan Strategy II* [JAP03]. Even though phase II retargets its focus from infrastructure to the use of ICT services, a *ubiquitous network* is assumed as the foundation for ICT applications.

The ubiquitous network is described as enabling *anytime, anywhere, anything access*, invoking the phrasing of 2001 quoted above. The 2003 strategy adds the following prediction.

This network will serve to not only connect people together but will become so seamless as to connect people with goods, as well as to connect the goods themselves together. [JAP03]

This is a very important observation. It is, in fact, the distinguishing mark of the “u” era. The “e” era is concerned with the acceptance of digital communication for legally binding information. The “u” era proceeds to include objects, not only humans, in the circle of information producers and consumers.

A transition in official language is evident in the 2003 strategy document.

- The title is “e-Japan”, linking back to the era of electronic document transfer.
- The body of the document expands beyond “e” era ideas. It explicitly counts on a ubiquitous network for delivering the new services.
- The ubiquitous network takes on a new dimension: Not only humans, but also inanimate (but intelligent) objects are able to communicate.

From this time on the word *ubiquitous* occurs frequently in descriptions of future Japanese ICT services. In fact, it is so heavily used that it seems to take on a life of its own.

In the annual white paper of the Ministry of Internal Affairs and Communications for the year 2006 [JAP06] the featured topic is *Ubiquitous Economy*. This phrase does not refer to “the economy found, or seeming to be found, everywhere” which would be the dictionary meaning. *Ubiquitous* has rather become jargon with quite different connotations. The editors of the white paper have sensed this, so the introduction contains the following clarification:

...“ubiquitous economy,” — or the social and economic characteristics which are brought by the development of ubiquitous networks toward achieving ubiquitous network society (u-Japan)...

In effect, the word *ubiquitous* has been redefined to signify (after slightly polishing the language)

characteristics brought about by the development of a ubiquitous network toward achieving a ubiquitous network society

The ubiquitous network is the centerpiece, not only for ICT, but as a factor for transforming society.

## **Korea**

Korea has had a succession of IT strategies since the 1980's. The *E-Korea Vision 2006* program [KOR02] appeared in 2002, one year after the *e-Japan Strategy* [JAP01]. The titles of these two documents are similar, but the language of the Korean strategy document is markedly different from its Japanese counterpart.

The *E-Korea Vision* is loaded with e-era words: e-commerce, e-government, e-literacy, e-procurement, e-learning, e-work, e-banking, e-money, and many others. The document does not elaborate on a conceptual framework. It is concerned with a number of practical measures for accelerating technological development and for adapting the Korean society to the e-era. It is hard to sense anything *ubiquitous* here.

Just one year later, in the annual white paper of the Ministry of Information and Communication for the year 2003 [KOR03], there is a definite change. The word *ubiquitous* is found many times from the Minister's foreword all through the document. It occurs in several combinations, like *ubiquitous society*, *ubiquitous computing*, *ubiquitous network*. The u-words do not prevent this document from retaining a considerable part of the “e” vocabulary. The “e” and “u” eras are both present

The phrase *ubiquitous society* is especially interesting because it is a sign of “u” jargon. The phrase has no well-defined meaning outside Korea and Japan. It should be interpreted like this, retaining some of the wording of the Japanese definition:

a society with the characteristics brought about by the development of ubiquitous computing

It seems Korean official language is less focused on infrastructure. The ubiquitous technology is not just the network, as in the Japanese documents, but something greater. Hence the *computing* inserted above by this author. Actually the construct *the ubiquitous* (without any object at all) may be seen in Korean documents.

In 2007 the *ubiquitous society* stands out as the main objective of the *Informatization White Paper* [NIA07]. *Ubiquitous* is assumed to be common knowledge. It is used in an illuminative way without definition.

The 2003 document does not define *ubiquitous*, but it uses the phrase *anytime anywhere communications* in several places. This phrasing is in line with the one used in the early Japanese documents.

A popular, up-to-date definition of *ubiquitous* is found in the [DRE07] web site. It contains the following highlights.

- Connected to network anywhere
  - Using anything as terminal
  - Safe and reliable network
  - Easy use of network
  - Free use of contents
- [DRE07]

This definition is also very similar to the Japanese one from 2001 quoted above, except for the the last item. Free use of contents is not typically mentioned as integral to ubiquitous services.

The definition in [DRE07] explicitly cites Mark Weiser as the *founder of Ubiquitous* and so acknowledges a heritage from ubiquitous computing in its “classical” sense.

## Summary

In a sample of the English versions of official Japanese and Korean documents, this is what we note:

- The language in Japanese and Korean strategy documents around 2001 is “e” era language.
- Around 2003 there is a transition to “u” era language.
- By 2007 both countries have developed a widely accepted “u” jargon with phrases like *ubiquitous economy* and *ubiquitous society* where *ubiquitous* does not have its dictionary meaning.

In the “u” jargon the word *ubiquitous* should be understood approximately like this (adapted from [JAP06]):

characteristics derived from being part of ubiquitous computing

Japanese documents focus on a *ubiquitous network* as the change agent. The network, not computing in general, is the technology component referred to as *ubiquitous*. There are not too many u-words, mostly “u-Japan”.

The Korean terminology differs slightly in a few ways:

- The technology denoted as *ubiquitous* is not limited to the network. It appears to be ubiquitous computing in general
- The *ubiquitous society* is consistently mentioned as the goal of ICT strategies
- There are many u-words: u-Korea, u-city, u-defence, u-life, etc.

Two e-words have survived into the “u” era even in Japanese and Korean terminology: e-government and e-commerce.

## 4. Everyday Language

A newcomer to Korean or Japanese ICT may be surprised by phrases like *the ubiquitous home*. How can a home be ubiquitous? Does this *ubiquitous* have any meaning at all, or is it just a buzz word?

To get an answer we must scratch the surfaces of the Korean and Japanese languages.

### Ubiquitous Loan Word

Korean and Japanese both have long-standing traditions of importing English words. As the interest in ubiquitous computing grew, the word *ubiquitous* also became a loan word.

Korean and Japanese are quite different, but loan words seem to suffer similar fates. For instance, the English *apartment* is truncated to *apatu* in both Korean and Japanese.

ユビキタス

*Yu-bi-ki-ta-su (Japanese)*

*Ubiquitous* as a loan word was only used in the context of *ubiquitous computing* or *ubiquitous network*. It was truncated to just *ubiquitous* without losing its close ties to *computing* and *network*.

### Domestic Use

The ICT strategies of both Korea and Japan have stressed the importance of raising public ICT awareness. Thus the *ubiquitous* language has been heavily

유비쿼터스

*Yu-bi-kwo-to-su (Korean)*

promoted, and *ubiquitous* has entered the vocabulary of the general public. As a loan word in Korean and Japanese, *ubiquitous* remains intertwined with future, exciting ICT services.

## Add Vision

It should be noted that part of the Korean and Japanese ICT national strategies are daring extrapolations of trends that are not generally recognized. In some cases they aim at least 10 years ahead. These countries have experienced that to win big the stakes are high.

This is different from Europe where the EU research programs tend to be safe bets, the outcome of compromise.

## Add Enthusiasm

Koreans and the Japanese seem to embrace new technology with an enthusiasm that is seldom seen in Europe. For instance, the web site of the Korean MIC [KOR08] presents itself in pastel colors and a rather playful style. The Japanese MIC [JAP08] is slightly less playful. Both sites offer huge quantities of information on current and future ICT development.

This may be compared to the Swedish Ministry of Enterprise, Energy and Communications where IT is only one of 11 areas. The statement on IT [SWE08] is defensive and very vague about the potential of IT.

## Translation

After importing *ubiquitous* into their languages, and after adding vision and enthusiasm the u-language is re-exported from Korea and Japan. Little does the rest of the world know about the connotations now associated with the u-words. *Ubiquitous* has taken on a meaning not to be found in ordinary dictionaries. It is closely related to future, exciting ICT services.

For a short translation, here is this author's advice to the Westerner encountering *ubiquitous* terminology in Korean or Japanese ICT documents.

- *ubiquitous* means *connected*, or *cool and connected*

The connectedness refers to a visionary Internet with broadband access from fixed and mobile terminals. For instance, the *ubiquitous home* means the connected home. Its gadgets, like refrigerator, heating and lighting, are all connected to the Internet.

The translation also holds for terms like USN, Ubiquitous Sensor Networks, that make sense with its dictionary meaning: *a sensor network found, or seeming to be found, everywhere*. This may sound ominous to a Westerner who imagines a society of total surveillance. However, the dictionary translation is not what native Koreans or Japanese would think of. To them it is probably more natural to understand the term as *a cool and connected sensor network*. The new meaning overrides the dictionary meaning.

USN is a key concept, because it embodies the idea of communicating objects, the distinctive feature of the “u” era.

## Summary

Following its odyssey in the Korean and Japanese languages, the word *ubiquitous* emerges from these countries for re-export. It has been boosted with vision and enthusiasm about exciting ICT services. In this context it should be translated *cool and connected, or, shorter, connected*.

The connectedness implicit in u-words is the *anywhere, anytime, anyhow* kind of ever present availability that is at the core of classical ubiquitous computing.

## 5. Conclusion

Classical *ubiquitous computing* appeared as a vision in the late 1980's. The vision predicted that computers would be everywhere. Still they would be nowhere to be seen because they would be embedded in all kinds of devices, including household utilities.

Not only would computers just control many everyday gadgets, they would also communicate, one to another. This kind of low-cost wireless communication has only recently become feasible.

Ubiquitous computing has been at the core of Korean and Japanese national IT strategies since around 2003. These countries stand out by very explicitly ushering in an “u” era after the “e” era. The “e” era is about legitimizing digital documents in person-to-person communication. The “u” era is when people also communicate with objects, and objects communicate with other objects.

The word *ubiquitous* was adopted as a loan word in Korean as well as Japanese. It was heavily publicized and generated a flurry of u-words.

After heavy domestic use in Korean and Japan, and after adding a visionary touch and a lot of enthusiasm, the u-vocabulary has been re-exported to the rest of the world. Baffled Western observers have found that *ubiquitous* is now used in a way that defies dictionary definitions.

The *ubiquitous* translation proposed in this report is

- *cool and connected, or just connected*

The connectedness refers to a visionary, ever-present Internet.

If you introduce an ICT product or service to the Korean or Japanese markets, gain credibility by making sure you know how to use the u-language. It includes the energy and enthusiasm with which Korea and Japan transform u-topia into u-life.

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