

Linguistic Aspects of Ubiquitous Computing

On “ubiquitous” in Japanese and Korean Information Technology

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Abstract—The term *ubiquitous computing* has been reshaped by a world-wide journey. It originated in the West, but began to subside from use. The u-word traveled East and was picked up by national information technology programs in Japan and Korea. These countries re-created the word *ubiquitous* as a loanword in Japanese and Korean, adding new energy. This paper tracks *ubiquitous computing* first from academia to Japanese and Korean government policy documents and then to the general public in these countries. When the loanwords are reflected back into English they are sometimes used in ways that baffle Westerners. The word *computing* has been dropped, but is understood in the remaining adjective *ubiquitous*. Practical advice is offered for effective international communication about ubiquitous computing. The future of *ubiquitous* terminology is sketched. Opportunities for Korean-Japanese linguistic cooperation are suggested.

Keywords: *Ubiquitous computing; u-era; Japanese loanword; Korean loanword*

1. Introduction

A newcomer to Korean and Japanese information technology soon discovers that the word *ubiquitous* is at the heart of the terminology. It is not just techno-speak. Cut down to the prefix “u-” it touches many areas of life, like u-home, u-learning, u-city, u-tourism, even u-life, and many others. The word seems charged with energy and visionary enthusiasm.

After the initial contact, some u-terms like *the ubiquitous society* definitely make Westerners raise their eyebrows in bewilderment, while Japanese and Koreans have no problems. On the other hand, the term *ubiquitous connectivity* is completely normal to a Western mindset, but contains a certain surprise factor for a Japanese or a Korean. How did this happen?

This paper calls attention to a fundamental ambiguity in the word *ubiquitous* in an information technology context. When communicating in English the meaning of the word depends on whether it is used with Western or Japanese or Korean connotations. By illuminating this

uncertainty and proposing a practical approach we hope to promote the understanding of ubiquitous computing.

The paper is written by an information and communication technology (ICT) professional primarily for other ICT professionals. The topic is inherently interdisciplinary. Thus the text is additionally intended to be readable by linguists.

Korea in this paper refers to the Republic of Korea, commonly known as South Korea.

2. Looking Back

In information technology the last 25 years are already history. This section stops briefly at selected landmarks in order to set the stage for the main discussion.

2.1 The Original Vision

In the late 1980's Mark Weiser (1952-1999) became the best known spokesperson for the emerging concept of *ubiquitous computing*. The article [14] appearing in the Scientific American 1991 marks a point where the concept was ready to be brought to a wider audience. It had previously been established in the computer science community. This was at a time when the Internet existed, but not the World Wide Web. International email and file transfers were available, but only to specialists.

In the article Weiser defines ubiquitous computing as the state when information processing has been so integrated into everyday activities that the technology is not noticed. Although information processing is everywhere it vanishes out of sight, disappearing into everyday appliances.

Another feature of the vision is wireless connectivity and communicating devices that form networks without human intervention. About the only low-cost technology available by Weiser's time was infrared, the method used in most remote controls. Mobile phones were awkward and extremely expensive at the time.

2.2 The E-Era

The use of e-words is a global phenomenon. *Email* has become part of everyday English. Terms like *e-government* and *e-commerce* are used internationally and will probably remain part of the world-wide vocabulary for some time.

The arrival of e-words is a signal of an underlying change requiring a new terminology. To understand the e-era, let us briefly consider its precursor. There was a period roughly around the 1970's when a word processor was a stand-alone piece of hardware [3]. An electric typewriter was the typical input and output medium. The purpose of this electronic machinery was to create perfect paper documents. New machines helped preserve old habits.

With the introduction of personal computers the word processor turned from hardware to software. It became a citizen of a greater information processing world where documents could easily be exchanged digitally. A question was inevitable: Why would a document have to be printed on paper to achieve binding status?

Much could be said about the seals, stamps, and signatures that make a paper document legally valid. Let us just conclude that most e-words are about replacing paperwork by digital solutions, to make digital communication as valid as physical paper transfer. The e-era is a period of opening up a new dimension in person-to-person communication, going from paper to digital. E-words are coined to describe this change. In all probability, when the e-era is over, digital will be the norm, and e-words will fade into oblivion.

The various regions of the world are in different states of progress with respect to the e-era. This means that the beginning of the e-era is not anchored to a particular year. Its end is yet to be seen.

2.3 The U-Era

The appearance of u-words is also a signal of an underlying change that requires new terminology.

Japan and Korea are the only countries to have explicitly transitioned from the e-era to into the u-era. The “u” is originally taken from the word *ubiquitous* in the term *ubiquitous computing*. A subsequent section will go to some detail about this process. Different terms have arisen in other settings. *Pervasive computing* seems to be favored in the West. For instance, the IEEE publishes a journal named *Pervasive Computing*. Even so the Yankee Group pleads for *Anywhere* [2] when it encourages businesses to get ready for what we would call the u-era.

The various terms have at least one thing in common, the “anywhere factor”. The goal of the e-era was to open the gates to the digital world. The u-era starts from there and takes digital communication another step forward. Its goal is to make digital communication available everywhere and in all circumstances.

The e-era is mainly about person-to-person communication. The u-era, in contrast, encompasses the explosion in the number of devices with communication ability and extends communication to objects. In addition to person-to-person there is object-to-person and object-to-object communication.

2.4 Present-Day Status

18 years after Weiser’s article [14], how much of the ubiquitous computing vision has come true? A few words of summary may be in place.

These days a home in a developed country may contain dozens of embedded procesors in various utilities like dishwashers, microwave ovens, stereo and

tv sets, digital cameras, mobile phones and others. A modern car likewise contains dozens of processors that are never mentioned in the owner's manual. Information processing really is everywhere and is vanishing out of sight, as Weiser predicted.

Processing is one main aspect of the vision, communication is another and perhaps less visible. The upcoming fourth generation (4G) mobile telephone networks have enough capacity to support most kinds of media, including video. 4G will be an important step towards the truly ubiquitous network.

A more mundane kind of networking also awaits its fulfillment. How about commodities like refrigerators, coffee makers, heating and air conditioning systems and lighting? We do not yet see them networked on a large scale. All-out connectivity is a key component of the ubiquitous computing vision. Short range radio communication may come to the rescue. Its cost has recently dropped to a level where it is feasible even for mass market commodities.

The ubiquitous computing vision really has come close, but is still unfolding. U-era terminology will be appropriate for a number of years to come.

3. The U-Era in Japan and Korea

The concept of ubiquitous computing has been known in academic circles since Weiser's days. This section examines in some detail how the word *ubiquitous* broke out from its computer science confines and became part of the Japanese and Korean languages.

Note about the sources: This discussion is mainly based on English translations of Japanese and Korean documents. Several sources have government origins. The Korean Ministry of Information and Communication (MIC) used to provide a rich supply of policy documents. However, the ministry was dismantled in 2008. Some of the historical documents seem hard to find after that time.

3.1 English Dictionary Definition

The word *ubiquitous* is defined in the following way in the well known *Chambers English Encyclopedic Dictionary*:

*found or seeming to be found everywhere; ever-present [from Latin *ubique*, everywhere]*

As for the frequency of *ubiquitous* in the English language, it typically turns up with a rank of around 14.000, depending on the corpus, some distance away from the core vocabulary. Thus it is often unfamiliar to persons with English as a second language.

3.2 Japan

The first Japanese national ICT program was launched in 2001. Its title was *e-Japan Strategy* [4]. Despite its title the document contains neither e-words nor u-words. Nevertheless, the anywhere factor is clearly visible. The strategy document depicts a future network infrastructure in the following words,

- *available at any time, anywhere and to anyone*
- *a great variety of choices and services*
- *safe, easy and secure*
- *affordable, high-speed and efficient*
- *indiscriminate regardless of nationality and consistent with global standards*

This is a very clear statement of what was to become the core of the u-era.

A second phase of the Japanese national ICT program was launched in 2003. The strategy document was entitled *e-Japan Strategy II* [5]. The document contains the e-words *e-government*, *e-commerce*, *e-learning* a few times each, while the term *ubiquitous network* occurs over a dozen times. The document also mentions “anytime, anywhere, anything access” (p. 30). The document might be characterized as having one foot in the e-era, the other in the u-era.

From this time on the word *ubiquitous* occurs so frequently in government documents that one may conclude it is widely known to the general public. “e-Japan” turns into “u-Japan”. The Ministry of Internal Affairs and Communications (MIC) publishes an annual white paper, *Information and Communications in Japan*. The featured topic of the 2006 white paper was *Ubiquitous Economy* [6]. It is important to note that this term goes beyond the dictionary definition above. It does not refer to an economy “found, or seeming to be found everywhere”. The next section will demonstrate a similar development in Korea.

Even in this short summary we cannot disregard the latest strategy document from the IT Strategic Headquarters: *i-Japan Strategy 2015* [7]. This document never mentions anything *ubiquitous*. Has the u-word proliferation backfired? From the position of an external observer we cannot know for sure yet.

3.3 Korea

Korea has had a succession of IT strategies since the 1980's. The *E-Korea Vision 2006* program [9] appeared in 2002, one year after the *e-Japan Strategy* [4]. The titles of these two documents are similar, but the language of the Korean strategy is markedly different from its Japanese counterpart. It is loaded with e-words: *e-commerce*, *e-government*, *e-literacy*, *e-procurement*, *e-learning*, *e-work*, *e-banking*, *e-money*, and several others. It is deeply rooted in the e-era. The word *ubiquitous* is nowhere to be found.

Just one year later, in the annual white paper of the Ministry of Information and Communication (MIC) for the year 2003 [10], there is a definite change. The word *ubiquitous* is found at least 20 times from the minister's foreword throughout 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 amount of the e-vocabulary. The e-era and the u-era are both present.

The term *ubiquitous society* is especially interesting because like *ubiquitous economy* it goes beyond the English dictionary definition. It does not refer to a society "found, or seeming to be found everywhere".

A 2007 white paper from the National Information Society Agency [11] has, on average, a u-word on every one of its 87 pages. It explicitly defines the future as *the ubiquitous era*, and frequently brings up *u-Korea* (19 occurrences) and *u-society* or *ubiquitous society* (15 occurrences). Note again the semantic shift of *ubiquitous* in these phrases. Some other u-terms found in this paper are *u-City*, *u-Cluster*, *u-Health*, *u-Home*, *u-Infrastructure*, *u-Life*. Ubiquitous computing is envisioned as a beneficial agent touching many areas of life.

The ubiquitous computing visions had their natural home in the Korean IT839 national program. This program was dismantled together with the Ministry of Information and Communication in 2008. Its action points were divided between several other ministries, among them the new Ministry of Knowledge Economy (MKE). Few, if any, traces of the u-era are visible in the MKE web site at the time of writing (by the end of 2009).

3.4 Country Characteristics

Japan and Korea are strikingly similar in their overall attitudes towards ubiquitous computing, as well as in their treatment of the *ubiquitous* loanword. Both countries have traditions of strong government initiatives quite unlike European countries. In the world market the two countries are competitors. Somewhat surprisingly, competition may enforce similarities as the two neighbors closely watch and react to each others' moves. After all no other countries have picked up ubiquitous computing as explicitly as these two. Even if similarities prevail this section attempts to find some differences.

Judging from government policy documents, Japan seems to have been ahead of Korea into picking up ubiquitous computing concepts. On the other hand, when Korea entered the *ubiquitous* scene it plunged headlong into the u-era, generating a surge of u-terminology. The Japanese attitude was somewhat more cautious.

A similar tendency was visible in the web sites of the ministries in charge of information technology strategy. The Korean MIC web site, now extinct, painted the bright future of u-Korea in pastel colors and happy families strolling in green parks. The Japanese MIC web site is more matter-of-fact.

With their uncompromising attitude, the Korean government may have created more commotion around *ubiquitous* than their Japanese

counterpart. The loanword became frequent enough in media to be worthy of note by simultaneous translators [1]. A survey of loanwords in the Japanese language [18] indicated that *ubiquitous* was one of the very least understood by the general public. However, the survey was made in 2002 and might not reflect later development.

At the end of the day the Korean MIC vanished while the Japanese MIC remains and still runs its web site.

Japanese documents often use the term “ubiquitous network society”. This may be interpreted either as a cautious attitude towards the English language, or as putting emphasis on technology. A ubiquitous network clearly is the technical requisite for ubiquitous computing. Korean policy documents, on the other hand, do not shy away from “the ubiquitous society”. By removing “network” the focus automatically turns to “society”, making technology a means to an end. The latest Japanese policy document from the IT Strategic Headquarters [7] also criticizes previous policies for being too technology centered.

In summary, as for government information technology policies, it seems that Korea tends to more readily throw itself into radical positions than Japan does, and with less self-reproach over past mistakes.

3.5 Corollary

In a sample of the English versions of Japanese and Korean government ICT policy-related documents we find this,

- Around 2001 the language is e-era
- Around 2003 there is a mixture of e-era and u-era language
- Between 2003 and 2006 both countries have developed a widely accepted “u-jargon” with phrases like *ubiquitous economy* and *ubiquitous society* where *ubiquitous* does not have its English dictionary meaning but has been subject to semantic shift.

In 2008-2009 we have seen signs that possibly indicate reduced government use of u-era terminology in Japan as well as Korea.

4. A Case of Contact Linguistics

Like other languages of the world the Japanese and Korean languages receive an influx from foreign languages, notably English. Contact linguistics is a research field in itself. For example, see [17]. We cannot pretend to cover more than a miniscule corner of this area.

The word *ubiquitous* has been borrowed into both Korean and Japanese. Both languages transform loanwords into a phonetic script, hangul and katakana, respectively. This means that the orthographic transformation is

inseparable from the phonetic adaptation. In Korean *ubiquitous* becomes *yu-bi-kwo-to-su* (유비쿼터스), in Japanese *yu-bi-ki-ta-su* (ユビキタス).

4.1 Reaching the General Public

The concept of ubiquitous computing originated in computer science circles, a very international community. A large body of IT-related Korean and Japanese scientific papers include the word *ubiquitous* in their title.

The previous section outlined how *ubiquitous* terminology began to appear in government documents in Japan and Korea. In this process two boundaries were being crossed,

- *ubiquitous* was no longer restricted to academia
- *ubiquitous* became frequent enough to be adopted into the native languages. As a loanword it began an existence somewhat independent of its English roots

With all this publicity, *ubiquitous* gained a mind share with the general public.

A paper for Korean simultaneous translators mentions *ubiquitous* as a neologism that appeared in 2003 in the Korean language [1]. The purpose of the paper is to alert translators of new terminology they should be aware of. A Korean examination of loanwords in the media during 2005 [8] notes *ubiquitous* among the IT words. It was outnumbered by *blog* by a factor 10, by *online games* by 50%, but ended up a remarkable third in its category.

In Japan, the “10 minute” Sanseido online dictionary [12] has a quick definition of *ubiquitous* for the curious general public: *To be able to use information and communication technology anywhere and at any time without noticing it.* This is remarkably close to the original definition of ubiquitous computing, except that all of the semantics is now present in the single adjective *ubiquitous*.

In Korea and Japan the word *ubiquitous* has attained a level of publicity it never did in the West.

4.2 [jk]ubiquitous

English words are often subject to alterations when adopted as loanwords in Korean or Japanese [13, pp 31f; 17, p 33]. Our observation is that *ubiquitous computing* has been subject to lexical truncation and semantic shift when adopted into Japanese and Korean. The main word (*computing*) has been dropped. All semantics has been transferred into the remaining adjective *ubiquitous*.

We find the following connotations being associated with *ubiquitous* as a loanword in Japanese as well as Korean.

- Anywhere connectivity and ever-present access to information and communication technology. The *ubiquitous* entries (again note the absence of *computing*) of the Korean [16] as well as the Japanese [15]

Wikipedia, although otherwise very different, offer this definition. (We assume Wikipedia expresses informed opinion, not necessarily authoritative, by native speakers of the language.)

- Since the u-era has not been fully realized, *ubiquitous* implicitly may convey a sense of futuristic, cutting edge technology, a coolness factor, if you will.

When the word *ubiquitous* is used with the above semantics we use the notation *[jk]ubiquitous* (“jk” referring to Japan and Korea).

4.3 [w]ubiquitous

The notation *[w]ubiquitous* (“w” as in Western) is used in this document to indicate that *ubiquitous* is used according to English dictionary definitions, “found or seeming to be found everywhere”.

For instance, you may state: “Sweden, the land of ubiquitous Christmas trees.” (This paper was finished at Christmas time.) The statement means that Christmas trees are so common in Sweden that they seem to be everywhere. There is no hint of computing or information technology.

4.4 Loanword Patterns

It is well known that loanwords have a tendency to get truncated when adopted into Japanese and Korean. Two common terms illustrate this.

- In Japanese *department store* has been borrowed and transformed into *depato*. The original term has been lexically truncated. Remarkably, the main word (*store*) has been dropped, leaving only the auxiliary *department* which has been further truncated. The original semantics has been loaded into the single remaining word.
- Korean has a similar tradition of truncating long loanwords. For instance, *super market* has been truncated to just *supo* (even though *supo maket* is also available). Again the main word is dropped and all semantics is transferred to the remaining auxiliary word.

These examples are included to demonstrate that lexical truncation and semantic shift is a generic process affecting several Japanese and Korean loanwords. Interestingly the two sample words occur in both languages with similar forms.

4.5 Corollary

The once academic term *ubiquitous computing* has touched the general public of Korean and Japan. In the process of being adopted as a loanword in Korean and Japanese, *ubiquitous computing* was subject to lexical truncation and semantic shift. The main word *computing* was dropped. The entire semantics is carried by the adjective *ubiquitous* alone.

Lexical truncation and semantic shift may be observed in other loanwords borrowed from English into Japanese and Korean.

5. The U-Trap

This section turns to practical implications of the previous sections.

A situation that requires special attention is u-terminology communication in English between a Japanese or Korean environment and a Western context. Is it possible to get trapped in u-terminology misunderstandings?

Given our model of two sets of *ubiquitous* connotations, [jk] and [w], this section offers a selection of u-trap test cases and finally suggests practical measures to bridge the differences between the two interpretations.

5.1 “Ubiquitous Network”

First test case: *ubiquitous network*. Typically occurs in context: Any.

[jk]ubiquitous interpretation: “A network allowing anywhere connectivity using cutting edge technology.”

[w]ubiquitous interpretation: “A network found or seeming to be found everywhere.”

The two interpretations are quite close to each other. A minor difference is the coolness factor present in the [jk] interpretation but not in the [w] counterpart because the [w] interpretation lacks built-in connotations of high tech.

It seems very unlikely that this test case would be the source of any serious misunderstanding.

5.2 “Ubiquitous Connectivity”

Second test case: *ubiquitous connectivity*. Typically occurs in context: Western.

[jk]ubiquitous interpretation: “Connectivity characterized by anywhere connectivity and cutting edge technology.”

[w]ubiquitous interpretation: “Connectivity found or seeming to be found everywhere.”

The [jk] semantics is close to an empty repetition. Connectivity is already present in *ubiquitous* and needs no duplication. A generous interpretation may focus on the coolness factor, “cutting edge connectivity”.

The [w] reading needs *ubiquitous* in order to state that the connectivity is found everywhere. The term is not unusual in Western marketing.

This test case contains a certain surprise factor for a typical Japanese or Korean mind. The surprise lies in discovering that a Westerner uses *ubiquitous*, as it were, without knowing what it really means.

5.3 “Ubiquitous Society”

Third test case: *ubiquitous society*. Typically occurs in context: Japanese or Korean.

[jk]ubiquitous interpretation: “A society characterized by anywhere connectivity and cutting edge technology.”

[w]ubiquitous interpretation: “A society found or seeming to be found everywhere.”

There is no immediate problem with the [jk] semantics even if the concept in itself is far-reaching. One may imagine a significant number of people and businesses getting used to anywhere connectivity. If the technology produces substantial benefits it may very well end up affecting the society as a whole.

The [w] semantics, on the other hand, is problematic. It is hard to picture a society found or seeming to be found everywhere. The statement has no apparent sense.

In this test case we see a puzzled Westerner while Japanese or Koreans have little problems. Communication is impeded. The u-trap may be avoided if the Westerner admits to not understanding.

Other examples in the same category are *ubiquitous home*, *ubiquitous economy*, *ubiquitous era*. A typical Westerner, expecting the [w] interpretation, has a hard time understanding how an abstract concept can be “found everywhere”.

5.4 “Ubiquitous Sensor Networks”

Fourth test case: *ubiquitous sensor networks*. Typically occurs in context: Japanese or Korean.

[jk]ubiquitous interpretation: “Sensor networks characterized by anywhere connectivity and cutting edge technology.”

[w]ubiquitous interpretation: “Sensor networks found or seeming to be found everywhere.”

Again the [jk] interpretation does not pose much of a problem. Only moderate technical understanding is required to imagine sensors able to link to a network.

The [w] interpretation also readily springs to mind, but conveys a very different perspective. To a Western mind it evokes images of a society where sensors are everywhere, a society of total surveillance. This impression is probably fueled by recent controversies over the sharp increase in monitoring of public places.

In this example both parties readily pick up a reasonable sense from the term. The problem is that the Westerner has a fundamentally different understanding of the term compared to a Japanese or Korean. There are no

flashing lights to warn that a misunderstanding is building up. This is a u-trap.

5.5 Avoiding the U-Trap

The term *ubiquitous computing* originated in the West, but the loanword *ubiquitous* belongs, of course, to the Korean and Japanese languages. Problems may arise when *ubiquitous* is communicated from a Western context, or reflected back into English from a Japanese or Korean context.

It may be useful for those who are accustomed to a Korean or Japanese context to realize that Westerners typically see no connection between the word *ubiquitous* and information technology. To them the word embodies the plain fact that something is found or seems to be found everywhere.

On the other hand, here is advice for Westerners grappling with *ubiquitous* used in a Japanese or Korean context: Think “connected”. Ever-present connectivity is the primary element in the definition of [jk]ubiquitous offered here. If the coolness factor is important, think “cool and connected”. This succinct translation is not complete, but provides semantic cues in the right direction for a Western mind. A problematic term like *the ubiquitous society* becomes *the connected society*; *ubiquitous sensor networks* becomes *connected sensor networks*. This handy translation takes the mystery out of many u-terms and rescues a Western mind from the u-trap.

6. Prospects and Opportunities for Cooperation

Today, with the ubiquitous network almost within sight, it is easy to underestimate the boldness of the Japanese and Korean governments when they launched their first IT strategies based on ubiquitous computing. At the time a new terminology was necessary to portray their visions. The question is, how long will it be needed?

Ubiquitous computing is about staying connected. The day constant connectedness is considered normal the need for u-terminology will decline. Connectedness, fixed and mobile, to information and media will become the naturally assumed state and will ultimately disappear from everyday language. We will only mention connectivity when it fails. This is similar to electricity. It is always there but is seldom mentioned directly, except when there is a power outage.

The eventual disappearance of *ubiquitous* terminology does not diminish its relevance today and for the near future. However, *ubiquitous* as a loanword in Japanese and Korean suffers from two disadvantages.

- It is not easily grasped by native speakers of Japanese and Korean, but tends to become jargon for the initiated,
- It is not easily communicated to the world outside Japan and Korea because of the u-trap described in the preceding section.

On the other hand, communication between initiated Japanese and Koreans is not a problem. The reason is that the semantics of the *ubiquitous* loanword is nearly identical in the two languages.

The Korean and Japanese languages have guardians with profound linguistic knowledge: the National Institute of the Korean Language [19] and the National Institute for Japanese Language (the awkward but official English name) [20]. Both institutes note the influx of English loanwords with well-founded hesitation. Clearly their native languages must be able to well express at least some of the imported concepts. Both institutes make attempts to replace loanwords by native vocabulary.

The Korean language institute proposes *durunuri* as a *ubiquitous* replacement. The meaning is approximately “all over the world”, probably alluding to the “anywhere factor”. The Japanese language institute seems to have postponed a recommendation. Minutes of meetings of the Foreign Words Committee over the period 2002–2005 may be found on the Internet [21]. Several meetings have brought up *ubiquitous*. One of the candidates discussed is “flexible time-space”.

Fears may be unfounded, but it is very important to find expressions matching the semantics of the *loanwords* in the two languages: [jk]ubiquitous. It would be a mistake to retrofit [w]ubiquitous semantics onto the new constructs.

Cooperation between the two national language institutes in this case has the potential of greatly benefiting the ubiquitous computing field. For the sake of unimpeded communication a solution might be to find a common [jk]ubiquitous replacement with Chinese roots. The semantics should be approximately “anywhere access to information and communication” or “always connected”. This is said with apologies to the national language institutes that normally favor native expressions in view of the longtime influence of Chinese in their languages. The great advantage of using a term with Chinese roots is that Koreans and Japanese will immediately understand each other on the kanji/hanja level and that communication with China opens up. A commonly agreed translation into English should be fixed at the same time.

7. Conclusion

The term *ubiquitous computing* has been reshaped by a world-wide journey. It originated in the West, but began to drop out of use. The paradox of ubiquitous computing is that ever-present information technology vanishes out of sight. Maybe even the term *ubiquitous computing* in a turn of irony succumbed to the fate inherent in the concept.

The u-word traveled East. Around 2001 *ubiquitous computing* was picked up by national ICT programs in Japan and Korea. It became something of a

trade mark of government ICT policies. These countries took possession of the word *ubiquitous* and re-created it as loanwords in Japanese as well as Korean. It was heavily publicized and generated a stream of u-terms like u-Japan, u-Korea, u-city, u-home and many others.

Out of this process the loanword *ubiquitous* emerged loaded with new energy and visionary enthusiasm, but also with new semantics. As a Japanese and Korean loanword there is no longer any lexical trace of *computing*. All semantics is present in *ubiquitous* alone. Computing and information technology is implied.

When *ubiquitous* is communicated between Western and Japanese or Korean mindsets it may be accompanied by an element of surprise in either direction. An English dictionary definition offers limited help. For Westerners our advice is: Think “connected”. For Japanese and Koreans it may be useful to realize that Westerners typically do not associate *ubiquitous* with information technology.

As for future research the discussion would benefit from being picked up by language scholars. For instance, Japanese-Korean cooperation in finding easily understandable replacements for the *ubiquitous* loanwords may be a rewarding research area.

ACKNOWLEDGMENT

The author is deeply indebted to Kyung Sook Kang and Gabriel Jonsson at the department of Korean at the University of Stockholm for their input and assistance. Mistakes and errors remain the responsibility of the author.

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