COMPOUNDING IN INFORMATION TECHNOLOGY TERMS:
A MORPHOLOGICAL STUDY

Rafica Sari
Faculty of Arts, Postgraduate, Universitas Padjadjaran
Korespondensi: Jl. Dipati Ukur 35 Bandung
Pos-el: rafica1276@yahoo.com

Abstrak

Dalam linguistik merupakan proses pembentukan kata yang sangat produktif dua kata atau lebih digabungkan menjadi sebuah kata baru. Proses ini sering dijumpai pada pembentukan kata atau istilah baru dalam bidang teknologi informasi. Compound word (kata majemuk) pada istilah-istilah bidang teknologi informasi adakalanya memiliki makna yang berbeda dari makna leksikal pembentuk kata majemuknya. Oleh karena itu, makalah ini ditulis untuk mendeskripsikan kata majemuk yang terdapat pada istilah teknologi informasi, mendeskripsikan cara penulisannya, dan mendeskripsikan makna leksikal pada kata majemuk tersebut. Berdasarkan analisis yang dilakukan dengan menggunakan metode deskriptif, diketahui bahwa kata majemuk dalam teknologi informasi memiliki beberapa kombinasi elemen dengan cara penulisan menggunakan open form, hyphenated-form, dan closed/solid form. Makna kata majemukyang terbentuk dari proses compounding pada istilah teknologi informasi ternyata lebih banyak mempertahankan makna leksikal dari masing-masing kata pembentuknya daripada membentuk makna baru.
Kata-kata kunci: *compounding, istilah teknologi informasi, makna leksikal.*

Abstract

In linguistic it is a process of word formation that is very productive in which two or more words are combined into a new word. This process is often found in the formation of new words or terms in the field of information technology. Compound words for terms in the field of information technology sometimes have a different meaning from the lexical meaning of each word that makes up the compound words. Therefore, this paper is written to describe compound words contained in information technology terms, to describes how to write them, and to describe lexical meanings of the compound words. Based on the analysis using a descriptive method, it was found that compound words in information technology have some combinations of elements by way of writing using open form, hyphenated-form, and closed/solid form. Meanings of compound words that are formed through the compounding process in the information technology terms seem to maintain lexical meaning of each constituent word rather than forming new meanings.
Keywords: *compounding, information technology terms, lexical meaning*

INTRODUCTION

The rapid development of information technology (IT) creates new inventions and changes that enter our lives. When it takes place, we are in the need of naming these new inventions and to communicate about them. Consequently, a great number of new words will be created since new things need new words.

Most new words are not new at all, they are simply additions to existing words or recombination of their components. The new terms in information technology are also formed from the existing words but usually have different in meaning. It can be seen in the following data:

(1) Android tablets will migrate to Android 4.0 *Ice Cream Sandwich*, the mobile operating system touted as the great unifier between the divergent Android 2.x phone and 3.x tablet platform.

(2) *PhotoDirector* also let you share images via Facebook or Flickr, or assemble a slide show movie and share it as an AVC, MPEG, or WMV file on You Tube.

When we hear the term Ice Cream Sandwich, we will probably assume that it is a frozen confection composed of a layer of ice cream "sandwiched" between two biscuits/cookies or slices of cake. In fact, Ice Cream Sandwich in data (1) is not a kind of food. Ice Cream Sandwich in data (1) is the dessert-themed Android codename for an upcoming version 4.0 update of the open source Android mobile operating system.

The term PhotoDirector in data (2), with Photo and Director run together with no separation, is not someone who coordinates a photo shoot, but it is the leading workflow software that lets someone manages huge photo libraries, enhance images and showcase his photography. In contrast, someone who coordinates a photo shoot is a Photo Director, with Photo and Director are written separately.

Practically, in the past and the present, people used - and still use - a variety of methods to create new words such as compounding, blending, coinage, and so forth. The word Ice Cream Sandwich and Photo Director in data (1) and (2) are created by using compounding. Compounding is a process where two or more existing words are put together to form a new word.

The creation of a new word is basically studied in Morphology, a study of word formation. As stated by McManis et al (1987:117), Morphology is "the study of how words are structured and how they are put together from smaller part". Some common word formation processes are derivation, compounding, acronym, back-formation, blending, clipping, coinage, proper names, and abbreviation. From those word formation processes, compounding is the most productive type of word formation process in English.

Compounding is one of the ways to create a new word, it is the most common types of word formation in English. Spencer (2001:1) says " A compound is a word which consists of two or more word". McManis (1987:129) supports this idea by saying that a compound is a word formed by the combination of two independent words. Another idea about compounding is given by Katamba (1993:54), a compound word contains at least two bases with are both words, or at any rate, root morphemes.

METHOD

The research applies the descriptive method. The descriptive method attempts to describe systematically a situation, problem, or phenomenon. Djajasudarma, (1993:8) says the descriptive method is a method to construct systematically and accurately description of the data and the phenomenon which are analyzed.

The data are taken from English computer magazines PCWorld.The writer collected the data and sequenced them as follows: the writer downloaded PCWorld magazines, readthe magazines, and found compound words which are information technology terms. After that, the writer consulted the online dictionaries of computer and technology terms www.webopedia.com and www.techterm.com to make sure that these terms are included as information technology terms. At the same time, the writer looked up the meaning of the terms. The writer then classified the data into elements of compounding. After that, the data are classified into the ways of compounding are written.Finally, the writer looked up each word that form a compound in the Merriam Webster Dictionary and Oxford Advanced Learner's Dictionary for its word class andlexical meaning.

FINDINGS AND DISCUSSIONS

In English, as many other language, a number of different compounding patterns are attested. Not all words from all word classes can combine freely with other words to form compounds. The following table shows the elements to create the compounds.

	Noun	**Adjective**	**Verb**
Noun	homework	headstrong	spoonfeed
Verb	pickpocket	__	transcode
Adjective	ultrabook	bittersweet	double-tap
Preposition	upgrade	Overactive	download

The table above describes the elements of compound words. They are Noun+Noun (NN), Verb+Noun (VN), Adjective+Noun (AN), Preposition+Noun (PN),Noun+Adjective (NA), Adjective+Adjective (AA), Preposition+Adjective (PA), Verb+Verb (VV), Noun+Verb (NV), Adjective+Verb (AV), and Preposition+Verb (PV). None with a structure Verb+Adjective (VA).

When the two words are in the same word classes or grammatical categories, the compound will be in this category: Noun+Noun, Adjective+Adjective, Verb+Verb. In English, the rightmost word in a compound is the head of the compound. Thus, when the two words fall into different categories, the class of the second or final word will be the grammatical category of the compound: Noun+Adjective=Adjective, Verb+Noun=Noun (Fromkin, 2003:93).

1. Kinds of Compound

Based on McCarthy's theory, there are three kinds of compound: compound nouns, compound adjectives and compound verbs (McCarthy,2002:60).

1.1 Compound Nouns

A compound noun is a noun that is made up of two or more words. Most compound nouns in English are formed by nouns modified by other nouns, verbs, adjectives, or prepositions.

Compound nouns are the most common type of compound in English. The elements of compound nouns are

Noun+Noun (NN), Verb+Noun (VN), Adjective+Noun (AN), and Preposition+Noun (PN). They are listed in the table below.

Elements			Examples
Noun	+	Noun	PhotoDirector, touchpad, cyberspace
Verb	+	Noun	Facebook, Google Play
Adjective	+	Noun	MagicHour, smartphone, dual-core
Preposition	+	Noun	Outlook, upgrade, on line

An example of compound noun with the elements of Noun+Noun is *PhotoDirector* in data (2) on the previous page.

> *PhotoDirector* also let you share images via Facebook or Flickr, or assemble a slide show movie and share it as an AVC, MPEG, or WMV file on You Tube.

The term *PhotoDirector* is created by joining the two words *photo* and *director* to form a new word *PhotoDirector*. The word *photo* is a noun and the word *director* is also noun. Thus, *PhotoDirector* is a compound noun with the elements Noun+Noun.

> (3) Google can recommend songs, too, and if you buy tracks
> on *Google Play* (formerly the Android Market), your friends on Google+ can listen to those tunes for free.

The word *Google* and *Play* are joined to form a new word *Google Play* as in data (3). The word *Google* is a verb and *Play* is noun. The combination of elements in the word *Google Play* are Verb+ Noun. Thus, *Google Play* is a compound noun with the elements Verb+Noun.

Compounds are written in various ways in English: with a space between the elements, with a hyphen between the elements, or simply with the two elements run together with no separation.The way the word is written does not affect its status as a compound.

According to Kavcic (2004: 10) there are three different possibilities of how compounds can be written; the open form, the hyphenated form, and the solid or closed form.

1. The open form, which does not involves hyphens and thus leaves words separate.
2. The hyphenated form connects words with hyphens.
3. The closed/solid form, which compounds elements form a single word with no hyphens or spaces between them.

Data (2) and (3) have different ways in writing their compounds. The two elements Noun+Noun in *PhotoDirector* are written with no separation, while the two elements Verb+Noun in *Google Play* run together with a space between the elements. Therefore, the compound *Photo Director* is a closed/solid form and the compound *Google Play* is an open form.

Compound nouns, form the plural in different ways. It is most common, particularly in informal usage, to consider the compound as a simple noun and pluralize the last element. For examples *assistant director* becomes *assistant directors, breakdown* becomes *breakdowns.* (Quirk, 1985:313). Data (4) describes compound noun which has plural form in the last element.

(4)   A powerful motivation for using *smartphones* is the need for civil inattention, i.e. to appear engaged with something while travelling, waiting, or in situations when we are forced to be together with others while on our own.

The word *smartphones* in data (4) is created by combining the two words *smart* and *phone*. The second element *phone* becomes *phones* to form the plural *smartphones*. The word *smartphones* is a compound noun in which *smart* is an adjective and *phones* is a noun. The elements of the word *smartphones* are Adjective+Noun, and it is a closed/solid form since its two elements run together with no separation.

1.2 Compound Adjectives

Compound adjectives containing two or more words that act as a single idea to modify a noun. An adjective or a noun can be in the first element, and a participle form in the second.

According to McCarthy (2002:60), the elements of compound adjectives are Noun+Adjective (NA), Adjective+Adjective (AA), and Preposition+Adjective (PA).They are listed in the table below.

Elements			Examples
Noun	+	Adjective	mouse-based, kind-hearted
Adjective	+	Adjective	grey-green, red-hot
Preposition	+	Adjective	underfull, overactive

Adjective or adverb plus past participle is one of the most common patterns for forming compound adjectives. This participle reaches full adjective status when it is compounded with another element. Some common examples would include:*cold-blooded, kind-hearted, old-fashioned, open-minded,well-behaved*.

(5)   When setting up your newly installed motherboard, you're greeted with Gigabyte's new UEFI BIOS with a GUI and *mouse-based* navigation.

The word *mouse-based* in data (5) is created by combining the two words *mouse* and *base*. Past participle is added to the word *base* to form *based*. In (5), the word *mouse-based* is a compound adjective that modifies the noun *navigation*. The elements in *mouse-based* are Noun+Adjective.The two elements Noun+Adjective in *mouse-based* are written with a hyphen between the elements, thus itis a hyphenated form.

The English language lacks clear rules for hyphenating compounds. However, the following guidelines from The American Heritage Book of English Usage can be taken into account (Kavcic, 2004: 11). They are:

a. Compound modifiers are generally hyphenated, for examples *high-school teacher, video-game industry.*
b. When an open compound is preceded by an adjective, the compound is often hyphenated, for example *old house-cat.*
c. Compound adjectives formed with *high-* or *low-* are generally hyphenated like in *low-budget films.*
d. Compound adjectives formed with an adverb plus an adjective or a particle are often hyphenated when

they occur as modifiers, for example *well-known actors*.

e. Omit the hyphen when the adverb ends in *–ly* in adverb-adjective compound, for example *nicely done job*.

f. Compound adjectives forms with an adjective and a noun with *–d* or *–ed* added should be hyphenated, for example *soft-hearted women*.

g. Compound adjectives formed with a noun, adjective, or adverb and a present participle are hyphenated when they occur as modifiers, for example *never-ending story*.

h. Compound nouns formed with a noun and a gerund are generally open, for example *trout fishing*, but some compounds have become closed, like in *housekeeping*.

i. Do not hyphenate compound modifiers formed of capitalized words, unless they are in apposition, for examples *Old English poetry, African-Americans*.

j. Nouns or adjectives that consists of a short verb combined with a preposition are either hyphenated or written solid (depending on the usage), for examples *a breakup, a bang-up job*.

k. Two compound elements put in apposition should be hyphenated, like in *director-producer*.

l. We do not usually hyphenate scientific compounds (name of chemicals, diseases, animals, insects, plants), for example *carbon monoxide poisoning*.

m. Put the hyphen between the elements of compound numbers from twenty-one to ninety-nine and in adjective compounds with a numerical first element, for xamples *twenty-first, 10-minute delay, two-sided question*.

n. Compound colour adjectives are hyphenated, for examples *dark-brown eyes, a red-gold sunset*. When colour compounds follow the noun, they should not be hyphenated, like in *The sky is reddish gold.*

Based on the rules for hyphenating compoundsabove, the compound *mouse-based* in data (5) supports the rule that says compound modifiers are generally hyphenated. The compound *mouse-based* in data (5) modifies the noun *navigation.*

1.3 Compound Verbs

A compound verb can be composed of verb and verb, noun and verb, adjective and verb or preposition and verb. The elements can be seen as Verb+Verb (VV), Noun+Verb (NV), Adjective+Verb (AV), and Preposition+Verb (PV).

Elements			Examples
Verb	+	Verb	sleepwalk
Noun	+	Verb	spoonfeed
Adjective	+	Verb	right-click, double-click
Preposition	+	Verb	upload, overclock

The table above is the list of the elements of compound verb. The word *double-click* is one example of compound verb with the elements Adjective+Noun. It can bee seen in data (6) below.

    (6)   To adjust your settings, first *right-click* the memory card

in Windows Explorer, choose Properties, click the Hardware tab, select the memory card reader, and choose Properties; then click the Policies tab, and choose Optimize for quick removal.

The term *right-click* in data (6) is created by joining the word *right* and *click* to create a new word *right-clik*. The word *right* is a noun and *click* is a verb. Therefore, the elements of *right-click* are Noun+Verb with the elements are written with a hyphen between the elements.

2. The Meaning of a Compound

The meaning of a compound usually cannot be predicted from the lexical meanings of words from which it is formed because compounds must be learnt as individual words.Spencer (2001:1) states that the meaning of a compound is usually to some extent compositional, though it is often not predictable. He gives an example; the word *popcorn*. *Popcorn* is a kind of corn which pops; once we know the meaning, it is possible to see how the parts contribute to the whole – but if we do not know the meaning of the whole, we are not certain to guess it by looking at the meaning of the parts.

(7) Songbird lets you edit track information and use various add-ons written by independent developers for such things as social media communication, lyrics and guitar tab music for your songs, and access to Last.fm and the 7digital music store.

When the first time people hear the word *songbird*, people will probably think that songbird is a kind of bird, but it is not. It happens because themeaning of the compound *songbird* does not follow from the lexical meanings of the word *song* and *bird*.

Lexical meaning can be represented by dictionary. It is the meaning of the base word and it relates to the individual word that make up the vocabulary of a language. Based on the dictionary, the lexical meanings of the word *song* (n) are:

a. the act or art of singing,
b. a short piece of music with words that you sing,
c. songs in general; music for singing.

The lexical meaning of the word *bird* (n) is a creature that is covered with feathers and has two wings and two legs.

In information technology, *Songbird* is a music discovery experience. It utilizes the cross-platform frameworks Mozilla XULRunner and GStreamer media framework, and largely capable of running on Microsoft Windows, Apple Mac OS X, Solaris and Linux.

Based on the lexical meanings of the word *song* and *bird* and the meaning of the term *songbird*, we know that *songbird* is neither a kind of song nor a kind of bird. The meaning of the compound songbird does not follow from the lexical meanings of each word.

However, data (8) shows that the compound *username* still retain the lexical meanings of each word.

(8) You then select Remote AccessMy files, at which point you can log on to your CloudPlug device with the same local *username* and password (which is separate from the online account) that you established during configuration.

The word *user* (n) has two lexical meanings as the following:
a. one that uses,
b. a person or thing that uses something, and the lexical meanings of the word *name* (n) are:

a. a word or phrase that constitutes the distinctive designation of a person or thing
b. a word or words that a particular person, animal, place or thing is known by,
c. a reputation that somebody/something has.

In information technology, *username* is the name people use to identify themselves when logging into a computer system or online service. Both a username (user ID) and a password are required.

Based on the lexical meanings of the word *user* and *name*, *user* is one that uses or a person that uses something, and *name* is a word or phrase that constitutes the distinctive designation of a person. Therefore, the meaning of the compound *username* still retains the lexical meanings of each word.

The meaning of a compound *video chat* in data (9) below alsoretains the lexical meanings of each word.

(9) Great reasons for your ISP to do this on your behalf abound: The procedure helps your ISP block the spread of viruses, identify illegal downloads, and prioritize the data transmitted by bandwidthheavy applications like *video chat* and VoIP so as to alleviate network congestion.

The word *video* (n) has some lexical meanings, they are:
a. the visual portion of television,
b. a recording of a motion picture or television program for playing through a television set,
c. a system of recording moving pictures and sound, either using videotape or a digital method of storing data.

The lexical meanings of *chat* (n) are:
a. light informal or familiar talk,
b. talking, especially informal conversation,
c. communication between people on the Internet.

In information technology, *video chat* is a technology for conducting audio and video interaction in real time between users at disparate locations. Video chats are typically conducted via a computer, tablet or smartphone device (also called videophone chatting), and may involve point-to-point (or one-to-one) interaction, as in the case of FaceTime and Skype, or multipoint (or one-to-many) interaction, as in the typical case of Google Hangouts.

The lexical meanings of the word *video* and *chat* show that the meaning of *video* that close to the meaning of the term *video chat* is the visual portion of television, and the meaning of *chat* is communication between people on the Internet. Therefore, the meaning of the compound *video chat* still retain the lexical meanings of each word.

CONCLUSION

After the research of this topic, it can be concluded that there are findings concerning compounding in information technology. First, compound nouns with the elements Noun+Noun and Adjective+Noun are the two most common elements in the process of compounding in information technology terms, while compound verbs are uncommon, and compound adjectives are very uncommon. Second, most compound words in information technology terms are written in closed/solid forms, followed by open forms, and hyphenated forms. The hyphenated forms are found mostly in compound words with one of the elements is adjective. Finally, most meanings of compound words in information

technology terms still can be predicted from the lexical meanings of each word in its element. Compound words whose meanings still retain the lexical meanings of each wordare larger in number than compound words whose meaningsdo not follow from the lexical meanings of each word.

ACKNOWLEDGEMENTS

REFERENCES

Djajasudarma, Fatimah. 1993. *Metode Linguistik. Ancangan Metode Penelitian dan Kajian.* Bandung: PT. Eresco

Fromkin, Victoria, *et al*. 2003. *An Introduction to Language*. 7th edition. USA: Wadsworth.

Katamba, Francis. 1993. *Morphology*. London: The Macmillan Press Ltd.

Kavcic, Andrej. 2004. *Compounding*. Ljubljana: University of Ljubljana.

McCarthy, Andrew Carstairs. 2002. *An Introduction to English Morphology: Words and Their Structure*. Edinburgh: Edinburgh University Press Ltd.

McManis *et al*. 1987. *Language Files.* Cambridge: CambridgeUniversity Press.

Quirk, Randolph, *et al*. 1985. *A Comprehensive Grammar of the English Language*. New York: Longman Inc.

Spencer, Andrew & Arnold M. Zwicky. 2001. *The Handbook of Morphology*. UK: Blackwell Publishers Ltd.

http://www.webopedia.com

http://www.techterm.com