Phonological replacement of loan words used in Indonesian

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Abstract - The study aimed to identify the phonological replacement of foreign words (primarily English words) adopted to Indonesian. The method used was descriptive that was to describe how the foreign words change after being adopted into Indonesian and how the phonemes in them change. By adopting a linguistic approach with simple descriptive analysis, the study was successful to analyze many adopted words. The findings of the study indicated that in the process of words adoption some phonemes underwent phonological replacement and some are constant. There are about twenty-six replacements that are successful to reveal, and these replacements are established as formulas (Formulas of phonological replacement).

Keywords: adoption, loan word, phoneme, replacement

1. Introduction

Some formal decisions have been established by the government to support the socialization of Indonesian and the disciplinary of foreign words use. The decisions are 1) instruction number 20, October 28th, 1991 by the Minister of Domestic Affairs, about the socialization of Indonesian, 2) instruction number I/U/1992, by the Minister of Education and Culture, about the improvement of effort in socializing Indonesian, 3) instruction number 344 1021 SJ. March 16th, 1995, by the Minister of Domestic Affairs to the governors, mayors, and regents all over Indonesia, about the discipline of the use of foreign words (PPPBI, 1995). All of these decisions are intended to maintain and to support the position of Indonesian as the national, states, and unifying language, and to enable its ongoing development today and in the future.

The disciplinary of foreign words use as mentioned in the last instruction above is a sign of serious attention paid by the government to the use of foreign words in Indonesian discourse. This means that the people of Indonesia may not use or insert foreign words as they like when they speak Indonesian. Concerning the importance of foreign word adoption, it is necessary to take into consideration the following quotations. Moeliono (1985) gave the following comment "Vocabulary development is needed to enable the expression of concepts and ideas of modern life. The socio-cultural horizon that transcends the closed boundaries of life gives rise to new words, terms and expressions in Indonesian.... two aspects deserve attention, respectively, a new lexical source for language development efforts and the formation procedure for the lexical elements".

Another statement says "As experienced by other languages on earth, Indonesian must use foreign words for ideas that have not been known in the culture so far, and there is no exact equivalent for that word in the language of the language. In such a situation, the foreign words are subject to Indonesian rules so that absorption is a form that has undergone adjustment" (PPPBI, 1995).

From the two quotations above we can make conclusions 1) foreign words adoption is absolutely needed in the modernization era, 2) adopted words are absolutely needed in order to express life concepts that are unavailable in Indonesian, 3) the adopted words should be suited to or be adapted with the system in Indonesian (spelling and pronunciation systems), 4) one important thing to consider is the procedure of reconstructing the foreign words to be adopted.

The procedure of reconstructing the adopted foreign words as mentioned above is not less important than the adopted words themselves, since Indonesian as the adopting language has its system and the words adopted from any foreign languages should follow this system. In other words, any words adopted from any foreign language should be adapted with the system in Indonesian.

This research is intended to study the words adopted from foreign languages primarily from English from a linguistic point of view. The main emphasis will be on the phonological replacement of foreign words primarily English words after being adopted into Indonesian.

The idea of choosing this topic "phonological replacement in words adoption" was firstly inspired by the fact of interference made by native speakers of Indonesian in speaking English. They usually replace the English phonemes that are unavailable

in Indonesian with Indonesian phonemes that nearly have the same sounds like them, e.g: phoneme / is replaced by phoneme /t/; phoneme // is replaced by phoneme /e/, and so on. From the observation, it is proved that this phenomenon formally occurs in words adoption; the word theory /iri/ becomes "teori"; the word system /sistm/ becomes "sistem". From the background above, the writer is interested to analyze much more how far the phonological replacement occurs in word adoption.

2. Method

2.1. Method of Research
This chapter contains a method of research, source of data, population and sample, the procedure of collecting data, and techniques of data analysis. This research uses a descriptive method. It presents a description of the phonological changes (replacement) of foreign words {primary English words} adopted into Indonesian.

2.2. Source of Data
The required data were obtained from dictionaries (Echols & Shadily, 2002; Pahlevi, 2017; Amijoyo, 2016; *Badan Pengembangan dan Pembinaan Bahasa Kemendikbud*, 2017), Daily newspapers (Kompas, July 22nd - September 12th, 2018), magazine of Gatra (October 25th - November 28th, 2018), and textbooks (Kurniawan, 2018; Kasman, 2018).

This research covers the foreign words which have formally been adopted into Indonesian and have been used in Indonesian discourse. While the samples cover one up to four adopted words for one phonological replacement.

2.3. Techniques of Data Analysis
The data collected was analyzed in the following ways. The adopted words collected from the data resources were juxtaposed with the original words in the foreign languages primarily English words. Then these words were classified according to the phonological replacement. One to four words were taken as examples for one phonological replacement.

The researcher provided a list of phonemes in English and in Indonesian to compare the English phonemes with Indonesian phonemes. The researcher used dictionaries to check the changes of phonetic symbols of phonemes in English words before and after being adopted into Indonesian. The English dictionaries chosen are those using the International phonetic alphabets {IPA}, while the Indonesian dictionary is *Kamus Besar Bahasa Indonesia* (2017).

3. Results and Discussion

3.1. Vowel Replacement
Phoneme /a/ as a replacing phoneme

Juxtaposition	Ind	Eng
	/a/	/i/
	asuransi	insurance /**in**ʃuərəns/
	fasilitas	facility/fəˈsilət**i**/
	etalase	etalage/itəˈl**i**dʒ/
	/a/	/æ/

abakus	abacus/**æ**bəkəs/ → (from latin)
/a/	/ə/
aborsi	abortion/∂bɔːʃn/
serbat	sherbet/se:b∂t/ → (from french)
/a/	/a:/
pal	paal/p**a:**l./ → (from dutch)
garasi	garage/gər**a:**dĵ/ → (from french)
/a/	/e/
aerobik	aerobic/<u>e</u>ər bik/
/a/	/ei/
inspirasi	inspiration/inspir**ei**ʃn/
/a/	/o/
watt	w<u>a</u>tt/w<u>**o**</u>t/
/a/	/a/
l<u>au</u>ns	lounge/l**a**undĵ/

   In the presentation above there are eight English phonemes that are used in the English words to be adopted : /i/, /æ/, /ə/, /a:/, /e/, /ei/, /o/ and /a/. In the process of words adoption one of these eight phonemes is constant that is phonemes /a/ and the others are replaced by phoneme /a/ (the same phoneme as the constant one) as used in the adopted words (Indonesian words). The orthographic forms: phoneme /i/ → <u>i</u>, <u>e</u>, <u>a</u>, and <u>y</u>, phoneme /æ/ → <u>a</u> phoneme /ə/ → <u>e</u> and <u>a,</u> phoneme /a:/ → <u>a</u> and <u>aa</u>, phoneme /e/ → <u>e</u>, phoneme /ei/ → <u>a</u>, phoneme /o/ → <u>a</u>, and phoneme /a/ → <u>o</u>

   Phoneme /i/ as a replacing phoneme

Juxtaposition:	Ind	Eng
	/i/	/i/
	imajinasi	imagination/<u>im</u>ədĵinei∫n/
	s<u>i</u>non<u>i</u>m	synonym / s<u>i</u>nən<u>i</u>m/
	b<u>i</u>snis	b<u>u</u>siness/b<u>i</u>snis/
	/i/	/i:/
	rut<u>i</u>n	rout<u>i</u>ne /ru:ti:n/ (from Old French)
	t<u>i</u>m	t<u>ea</u>m /t<u>i:</u>m/
	/i/	/juə/
	b<u>i</u>ro	bereau /bjuərəu/ (French)
	/i/	/ai/
	ideal	ideal /aidiəl/
	/i/	/ə/
	akademisi	academician / əkʌdə 'miʃən/ (Greek)

   In the presentation above there are five English phonemes that are used in the English words to be adopted : /i/, /i:/, /juə/, /ai/, and /ə/. In the process of words adoption one of these five phonemes is constant that is phoneme /i/ and the others are replaced by phoneme /i/ (the same phoneme as the constant one) as used in the adopted words (Indonesian words).

   The orthographic forms : phoneme /i/ → <u>i</u>, <u>y</u>, and <u>u</u>; phoneme /i:/ → <u>i</u> and <u>ea</u>; phoneme /juə/ → <u>u</u>, phoneme /ai/ →<u>i</u> and phoneme /ə/ →<u>ia</u> or <u>io</u>.
Phoneme /u/ as a replacing phoneme.

Juxtaposition:	Ind	Eng

	/u/	/u/
	buletin	bulletin/bulətin/
	/u/	/uː/
	institut	institute/institʃuːt/
	kartun	cartoon /kaːtuːn/
		coupon /kuːpon/
	/u/	/ʌ/
	bujet	budget/bʌdĵit/
	/u/	/juə/
	vakum	vacuum /vækjuəm/ → (from latin)
	sekuriti	security / si'kjuəriti/
	/u/	/ɔ(:)/,
	turbin	turbin/'tɔːbain/
	jurnal	journal /dĵɔːnl/
	/u/	/juː/
	unit	unit/juːnit/
	/u/	/ə/
	memorandum	memorandum/memə'rændəm/
	direktur	direktor /dairektə/ (Latin via Dutch)
	/u/	/au/
	akuntansi	accountancy / ∂'kaunt ə nsi/
	/u/	/uə/
	turis	tourist /tuərist/
	/u/	/ju/
	manuskrip	manuscript/mənjuskript/ /→ (from Latin)

In the presentation above there are ten English phonemes that are used in the English words to be adopted :/u/, /uː/, /ʌ/, /ju∂/, /ɔː/, /juː/, /∂/, /au/, /u∂/ and /ju/. In the process of words adoption one of these ten phonemes is constant that is phoneme /u/ and the others are replaced by phoneme /u/ the same phoneme as the constant one as used in the adopted words (Indonesian words).

The orthographic forms: phoneme /u/ → u; phoneme /uː/ → u, oo and ou; phoneme /ʌ/ → u; phoneme /ju∂/ → u and uu; phoneme /ɔː/ → u and ou; phoneme /juː/ → u; phoneme /∂/ → u and ophoneme /au/ → ou; phoneme /u/ → ou; and phoneme /ju/ → u.

Phoneme /e/ as a replacing phoneme.

Juxtaposition: Ind   Eng

	/e/	/e/
	etnik	ethnic/'eθnik/
	etiket	etiquette/ 'etiket/ → ə (from french)
	/e/	/i/
	erotik	erotic/irotik/
	/e/	/iə/
	ide	idea / ai'diə/
	/e/	/ɔ(:)/
	eksper	expert/'ekspɔːt/
	/e/	/ə/

sist<u>e</u>m	syst<u>e</u>m/sist<u>ə</u>m/
/e/	/i:/
<u>e</u>nologi	<u>oe</u>nology/<u>i</u>: nælədʤi/ → (from latin)
estetik	<u>ae</u>sthetic/<u>i:</u>stetik/ → (from greek)
<u>e</u>kuivalen	equivalent/<u>i:</u>kwivələnt/

In the presentation above there are six English phonemes that are used in the English words to be adopted : /e/, /i/, /iə/, /ɔ:/, /ə/ and /i:/. In the process of words adoption one of these six phonemes is constant that is phoneme /e/, and the others are replaced by phoneme /e/ (the same phoneme as the constant one) as used in the adopted words words (Indonesian words).

The orthographic forms: phoneme /e/ → <u>e</u> and ue; phoneme /i/ → <u>e</u>; phoneme /i /
→ <u>ea</u>; phoneme / :/ → <u>e/r</u>; phoneme / / → <u>e</u>; phoneme /i:/ → <u>oe</u>, <u>ae</u>, and <u>e</u>.

Phoneme /o/ as a replacing phoneme

Juxtaposition:	Ind	Eng
	/o/	/ɔ:/
otentik	authentic/ ɔ:tentik/
order	order/ɔ:dər/
	/o/	/o/
obyek	object/obdʒikt/
	/o/	/ə/
obsesi	obsession/əb'seʃn/
	/o/	/əu/, /əu'ɔ:/, /əu'ə/
oto	outo /ɔ:təu/ → (from greek)
koordinasi	coordination/kəu'ɔ:dineiʃən/
koalisi	coalition/kəuə'liʃən/

In the presentation above there are four English phonemes that are used in the English words to be adopted : /ɔ:/, /o/, /ə/, and /əu, əu'ɔ:, əu'ə/. In the process of words adoption, all of these four phonemes are replaced by phoneme /o/ as used in the adopted words (Indonesian words).

The orthographic forms: phoneme /ɔ:/ → <u>au</u>, and <u>o</u>; phoneme /o/ → <u>o</u>; phoneme /ə / → <u>o</u>; phoneme /ə u/ → <u>ou</u>, <u>oo</u>, and <u>au</u>.

From the presentation of phonological replacement for vowel phonemes, we can make some notes as follows:

Each of the five vowel phonemes in Indonesian as used in the adopted words replaces four to ten English phonemes. Phonemes /a/ and /u/ among them replace great number of English phonemes. Phonemes /a/ replaces eight English phonemes and phoneme /u/ replaces ten phonemes. On the other hand, there is an overlapping since some of the English vowel phonemes here could be replaced by more than one Indonesian vowel phoneme as used in the adopted words (Indonesian words). Those phonemes are /i/, /ə/, /o/, /i:/, /juə/, and /ɔ:/.

Phoneme /i/ could be replaced by three Indonesian phonemes : /a/, /i/, and /e/.
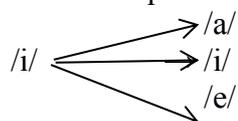
Phonemes /ə/ could be replaced by five Indonesian phonemes : /a/, /i/, /u/, /e/, and /o/ .

/ ə / → /a/
/i/
/u/
/e/
/o/
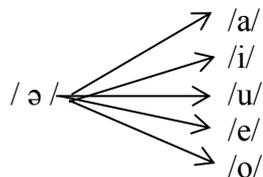
Note: Phoneme /ə/ is the most general one since it could be replaced by the five Vowel phonemes in Indonesian.

Phoneme /o/ could be replaced by two Indonesian phonemes : /a/, and /o/.

/o/ → /a/
/o/
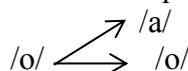
Phoneme /i:/ could be replaced by two Indonesian phonemes : /i/ and /e/ .

/i:/ → /i/
/e/
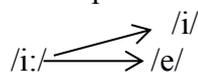
Phoneme /juə/ could be replaced by two Indonesian phoneme : /i/ and /u/ .

/juə/ → /i/
/u/
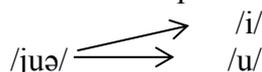
Phoneme /ɔ:/could be replaced by two Indonesian phoneme : /u/ and /e/ .

/ɔ:/ → /u/
/e/
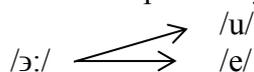
Among the twenty two English phonemes (vowels and combinations of vowels) presented above; eighteen phonemes of them undergo phonological replacement. These phonemes are not available in Indonesian and they are replaced by the five vowel phonemes in Indonesian. The other fours vowel phonemes here are constant.

One English vowel phoneme may be represented by one to four orthographic forms and these orthographic forms are different from the phonetic symbols of most of the vowel phonemes here. This phonemenon does not happen in Indonesian since one phoneme may only be represented by one orthographic form and the phonetic symbols are the same as the orthographic forms in Indonesian.

Some of the words used as examples above are derivative words. Example: the word insurance /inʃuərəns/ becomes "asuransi".

Suffix /ə ns/ (represented) by <u>ance</u>) is available in this word and phoneme /ə/ in this suffix is replaced by phoneme /a/ as used in the adopted word "asur<u>a</u>nsi". The combination of vowels primarily the diphthongs covered here are replaced by single vowels in the adopted words (Indonesian words). However, some combinations of vowels could be replaced by combinations of vowels too. There is an English diphthong that is replaced by Indonesian diphthong. This phenomenon could be seen below.

In the case of combinations of vowels, lets look at some examples as follows:

trotoar /oa/ ←/wa:/ trottoir /trotwa:/
serius /iu/ ← /iə/ serious /siəriəs/
aerobik /ae/ ← /eə/ aerobic /eərəbik/
kaison /ai/ ← /ei/ caisson /keiʃn/
realisme /ea/ ← /iə/ realism /riə'lizəm/
geologi /eo/ ←/io/ geology /dʒio'lədʒi/

geometrik /eo/ ← /iə/ geometric /dʒioˈmetrik/
euporia /eu/ ← /ju:/ euphoria /ju:fɔ:riə/
varietas /ie/ ← /aiə/ variety /vəra'iəti/
akuarium /ua/ ←/weə/ aquarium /əkweəriəm/
kualitas /ua/ ← /wo/ quality /kwoliti/
duet /ue/ ← /ju:ə/ duet /dʒu:ət/

In the presentation above, all combinations of vowels undergo phonological replacement, but it seems that the replacing sounds used in the adopted words (Indonesian words) just follow the orthographic forms of the English sounds replaced

Three combinations of vowels presented above are English diphthongs; one of them is replaced by Indonesian diphthong of them are replaced by usual combination of vowels.

So some English diphthongs are replaced by single vowels and some are replaced by usual combinations of vowels. The only English diphthongs that are replaced by Indonesian diphthongs here are <u>ie</u> and au that are replaced by <u>ia</u> and <u>au</u>.

3.2. Consonant Replacement

Phoneme /b/ as a replacing phoneme

Juxtaposition: Ind   Eng
                            /b/   /b/
                            tablet   tablet/tæblit/

There is no phonological replacement here, phoneme /b/ is constant since it is used both in English words and in the adopted words (Indonesian words).

The orthographic form of phoneme /b/ here is <u>b</u>

Phoneme /c/ as a replacing phoneme :

Juxtaposition: Ind   Eng
                            /c/   /tʃ/
                            cek   <u>ch</u>eck /tʃe k/

Actually there is no phonological replacement here but the phonetic symbol changes English uses phonetic symbol /tʃ/ fore the some sound as /c/ in Indonesian. So there is only a replacement of phonetic symbol here.

The orthographic from of phoneme /tʃ/ here is <u>ch</u>.

Phoneme /d/ as a replacing phoneme:

Juxtaposition: Ind   Eng
                            /d/   /d/
                            data   <u>d</u>ate /deita/
                            dobi   <u>d</u>hobi /dəubi/ (from Sanskrit)

Again, there is no phonological replacement here, phoneme /d/ is constant since it is used both in English words and in the adopted words (Indonesian words).

The orthographic forms of phoneme /d/ here are <u>d</u> and <u>dh</u>.

Phoneme /f/ as a replacing phoneme:

Juxtaposition: Ind   Eng
                            /f/   /f/
                            faktor   <u>f</u>actor /fæktə/
                            fase   <u>p</u>hase /feis/ → (from french)
                            staf   sta<u>ff</u> /sta:f/

        /f/   /v/

      intensif   intensi<u>ve</u> /intensive/

In the presentation above there are two English phonemes that are used in the English words to be adopted : /f/ and /v/.

Phoneme /f/ is constant while phoneme /v/ is replaced by phoneme /f/ (the same phoneme as the constant one), in the process of words adoption.

The orthographic forms of phoneme /f/ are <u>f</u>, <u>ff</u>, and <u>ph</u>, the orthographic form of phoneme /v/ is <u>v</u>.

Phoneme /g/ as a replacing phoneme:

Juxtaposition:	Ind	Eng
	/g/	/g/
	sorgum	sor<u>gh</u>um /sɔ:gəm/ (from French)
	bagasi	ba<u>gg</u>age /bægidĵ/
	garasi	<u>g</u>arage /gəra:dĵ/
	/g/	/dĵ/
	gen	<u>g</u>en /dĵen/
	solfegio	solfe<u>gg</u>io /solfedĵiəu/

In the presentation above there are two English phonemes that are used in the English words to be adopted : /g/ and /dĵ/. Phoneme /g/ is constant while phoneme /dĵ/ is replaced by phoneme /g/ (the same phoneme as the constant one) in the process of words adoption.

The orthographic forms of phoneme /g/ here are <u>g</u>, <u>gg</u>,<u>gh</u> and the orthographic forms of phoneme /dĵ/ are <u>g</u> and <u>gg</u>.

Phoneme /h/ as a replacing phoneme:

Juxtaposition:	Ind	Eng
	/h/	/h/
	higiene	<u>h</u>ygiene /haidĵ:n/ (from French)

There is no phonological replacement here phoneme /h/ is constant since it is used both in English words and in the adopted words (Indonesian words).

The orthographic form of phoneme /h/ is <u>h</u>.

Phoneme /j/ is a replacing phoneme:

Juxtaposition:	Ind	Eng
	/j/	/dĵ/
	jargon	<u>j</u>argon / dĵa:gon/
	jendral	<u>g</u>enral /dĵenərəl/
	bujet	bu<u>dg</u>et /bʌ dĵit/

There is no phonological replacement here but the phonetic symbol changes. English uses phonetic symbol /dĵ/ for the same sound as /j/ in Indonesian. So there is only a replacement of phonetic symbol here.

The orthographic forms of phoneme /dĵ/ here are <u>j</u>, <u>g</u>, <u>dg</u>.

Phoneme /k/ as a replacing phoneme:

Juxtaposition:	Ind	Eng
	/k/	/k/
	sketsa	s<u>k</u>etch /s<u>k</u>etʃ/
	kubik	<u>c</u>ubic /<u>k</u>ju:bik/

kuota	quota /kwəutə/	
akurat	accurate /ækjərət/	
karisma	charism /kə'rizmə/	
stok	stock /stok/	

There is no phonological replacement here. Phoneme /k/ is constant since it is used both in English words and in the adopted words (Indonesian words).

The orthographic forms of phoneme /k/ here are k, c, q, cc, ch, ck.

phoneme /l/ as a replacing phoneme:

Juxtaposition:	Ind	Eng
	/l/	/l/
	label	label /leibl/
	polusi	pollution /pə'lu:ʃən/

There is no phonological replacement here. Phoneme /l/ is constant since it is used both in the English words and in the adopted words (Indonesian words).

The orthographic forms of phoneme /l/ here are l, and ll.

Phoneme /m/ as a replacing phoneme:

Juxtaposition:	Ind	Eng
	/m/	/m/
	tim	team /ti:m/
	komunisme	communism /komju:nizəm/

There is no phonological replacement here. Phoneme /m/ is constant since it is used both in English words and in the adopted words (Indonesian words).

The orthographic forms of phoneme /m/ here are m and mm.

Phoneme /n/ as a replacing:

Juxtaposition:	Ind	Eng
	/n/	/n/
	nasional	national/næʃənl/
	koneksi	connection /kə'nekʃə n/

There is no phonological replacement here. Phoneme /n/ is constant since it is used both in English words and in the adopted words (Indonesian words).

The orthographic forms of phoneme /n/ here are n and nn.

Phoneme /p/ as a replacing phoneme:

Juxtaposition:	Ind	Eng
	/p/	/p/
	pilot	pilot /phailət/
	apel	apple /æpəl/
	/p/	/v/
	adpis	advice /∂dvais/
	/p/	/f/
	telefon/telepon	telephone /telifəun/

In the presentation above there are three English phonemes that are used in the English words to be adopted : /p/, /v/, and /f/. Phoneme /p/ is constant, phoneme /v/ and /f/ are replaced by phoneme /p/ (the same phoneme as the constant one) in the process of words adoption.

It is necessary to note here that phoneme /p/ is frequently pronounced with aspiration in English words such as /p/ in pilot /phail t/. Aspiration itself can be

divided into two kinds: strong aspiration and weak aspiration. Strong aspiration usually occurs when /p/ is between two vowels. (Jackson, 1982:29). Phoneme /p/ with aspiration in English words is replaced by phoneme /p/ without aspiration in the adopted words (Indonesian words).

The orthographic forms of phoneme /p/ are p̲ and p̲p̲. The orthographic forms of phonemes /v/ and /f/ are /v/ and /ph/.

Phoneme /r/ as a replacing phoneme:

Juxtaposition:	Ind	Eng
	/r/	/r/
	r̲adikal	r̲adical /rædikl/
	kor̲r̲upsi	cor̲r̲uption /kərʌpʃən/
	r̲itma/r̲itme	r̲hythm /riđəm/

There is no phonological replacement here. Phoneme /r/ is constant since it is used both in English words and in the adopted words (Indonesian words). The orthographic forms of phoneme /r/ are r̲, r̲r̲, and r̲h̲.

Phoneme /s/ as a replacing phoneme:

Juxtaposition:	Ind	Eng
	/s/	/s/
	s̲abotase	s̲abotage /sə̲bətaĵ/
	s̲entral	c̲entral /s̲entrəl/
	sain̲s̲	s̲cience /s̲aiəns/
	/s/	/ʃ/
	me̲s̲in	ma̲c̲hine /məˈʃiːn/
	ak̲s̲i	a̲c̲tion /ækʃən/
	artifi̲s̲ial	artifi̲c̲ial /aːtifiʃəl/
	komi̲s̲i	commi̲ss̲ion /kɔːmiʃən/
	/s/	/z/
	sadi̲s̲me	sadi̲s̲m /seidiz̲əm/
	/s/	/ĵ/
	vi̲s̲i	vi̲s̲ion /viʃən/
	/s/	/dĵ/
	etala̲s̲e	etala̲g̲e /itaˈlidĵ/
	prakti̲s̲	practi̲c̲le /præktik̲l/

In the presentation above there are six English phonemes that are used in the English words to be adopted: /s/, /ʃ/, /z/, /ĵ/, /dĵ/, and /k/. Phoneme /s/ is constant, phoneme /ʃ/, /z/, /ĵ/, /dĵ/, and /k/ are replaced by phoneme /s/ (the same phoneme as the constant one) in the process of words adoption.

The orthographic forms of phoneme /s/ are s̲, c̲, s̲c̲; phoneme /ʃ/ → c̲, c̲h̲, t̲, s̲s̲, phoneme /z/ → s̲; phoneme /ĵ/ →s̲; phoneme /dĵ/ / →g̲; phoneme /k/ / →c̲.

Phoneme /t/ as a replacing phoneme:

Juxtaposition:	Ind	Eng
	/t/	/t/
	s̲t̲abil	s̲t̲able /st̲eibl/
	bot̲ol	bot̲t̲le/bot̲l/
	/t/	/θ/
	t̲eori	t̲h̲eory /ˈθiəri/

<div align="center">

/t/   /δ/

ritma   rhy<u>th</u>m /riδəm/

</div>

In the presentation above there are three English phonemes that are used in the English words to be adopted : /t/, /θ/, and /đ/. Phoneme /t/ is constant, phoneme /θ/ and /đ/ are replaced by phoneme /t/ (the same phoneme as the constant one) in the process of words adoption.

It is necessary to note here that phoneme /t/ is frequently pronounced with aspiration phoneme /t/ with aspiration in English words is replaced by phoneme /t/ without aspiration in the adopted words (Indonesian words).

The orthographic forms of phoneme /t/ are <u>t</u> and <u>tt</u>. The orthographic forms of phonemes /θ/ and /đ/ here is <u>th</u>.

Phoneme /v/ as a replacing phoneme:

Juxtaposition: Ind   Eng

/v/   /v/

televisi   tele<u>v</u>ision /teli<u>v</u>i∫ən/

There is no phonological replacement here. Phoneme /v/ is constant since it is used both in English words and in the adopted words (Indonesian words)..

The orthographic forms of phoneme /v/ is<u>v</u>.

Phoneme /w/ as a replacing phoneme:

Juxtaposition: Ind   Eng

/w/   /w/

<u>w</u>agon   <u>w</u>agon /<u>w</u>ægən/

wiski   <u>wh</u>isky /<u>w</u>iski/

There is no phonological replacement here. Phoneme /w/ is constant since it is used both in English words and in the adopted words (Indonesian words). The orthographic forms of phoneme /w/ are <u>w</u> and <u>wh</u>.

Phoneme /x/ as a replacing phoneme:

Juxtaposition: Ind   Eng

/x/   /x/ or /eks/

x-ray   <u>x</u>-ray /<u>eks</u>-ræi/

/x/   /z/

xilofon   <u>x</u>ylophone /<u>z</u>ailəfəun/

In the presentation above there are two English phonemes that are used in the English words to be adopted : /x/, or /eks/ and /z/. Phoneme /x/ is constant, while phoneme /z/ is replaced by phoneme /x/ (the same phoneme as the constant one) in the process of words adoption. The orthographic forms of phoneme /x/ is <u>x</u> and the orthographic form of phoneme /z/ here is <u>x</u>. It is necessary to note here that there is no special sound replaced by /x/ in English (Lowe, 1987: 256).

Phoneme /y/ as a replacing phoneme:

Juxtaposition: Ind   Eng

/y/   /j/

yard   <u>y</u>ard /ja;d/

fyord   f<u>j</u>ord /f<u>j</u>o:d/

/y/   /i/

bay<u>onet</u>   ba<u>y</u>onet /beinit/

/y/   /dĵ/

| mayor | mayor /mei̯dĵə/ |
| obyek | object /obĵikt/ |

In the presentation above there are three English phonemes that are used in the English words to be adopted : /j/, /i/ and /dĵ/. These three English phoneme are replaced by phoneme /y/ in the adoption words (Indonesian words). The orthographic forms: phoneme /j/ →j, y;phoneme /i/ → y; and phoneme /dĵ/ →y, j.

Phoneme /z/ as a replacing phoneme:

Juxtaposition:	Ind	Eng
	/z/	/z/
	plaza	plaza /pləzə/ (from Spanish 'platha')
	mezanin	mezzanine /mezə'ni:n/

There is no phonological replacement here. Phoneme /z/ is constant since it is used both in English words and in the adopted words (Indonesian words).

The orthographic forms of phoneme /z/ are z and zz.

From the presentation of phonological replacement for consonant phonemes, we can make some notes as follows.

It is found that in the process of words adoption some English consonant phonemes are constant and some undergo phonological replacement. The consonant ones are /b/, /tĵ/ (the symbol is replaced), /d/, /f/, /g/, /h/, /k/, /l/, /m/, /n/, /o/, /p/, /r/, /s/, /t/, /v/, /w/, /x/, /z/. on the other hand the phonemes that undergo phonological replacement are : /f/, /dĵ/, /k/, /ʃ/, /ĵ/, /θ/, /đ/, /v/, and /z/. there is some overlapping on some phonemes here, they may be constant and may be replaced by other phonemes, those phonemes are :/f/, /k/, and /z/.

Now, we can check the detail of the overlapping and how some of the English consonant phonemes could be replaced by more than one phonemes in the adopted words.

Phoneme /f/ could be replaced by phonemes /f/ and /p/.

/f/ ⟶ /p/
        /f/

Phoneme /dj/ could be replaced by phonemes /g/, /j/, /s/ and /y/.

/dj/ ⟶ /g/
         /j/
         /s/
         /y/
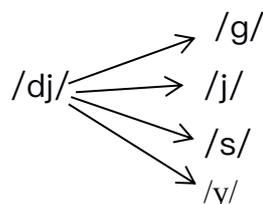
Phoneme /k/ could be replaced by phonemes /k/ and /s/.

/k/ ⟶ /k/ (constant)
        /s/
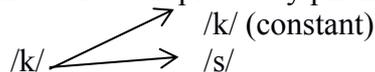
Phoneme /v/ could be replaced by phonemes /f/ and /v/.

/v/ ⟶ /f/
        /p/
        /v/ (constant)
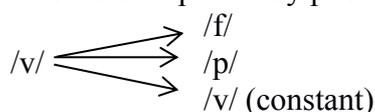
Phoneme /z/ could be replaced by phonemes /s/, /x/ and /z/.

$$/z/ \longrightarrow \begin{array}{l} /s/ \\ /x/ \\ /z/ \text{ (constant)} \end{array}$$
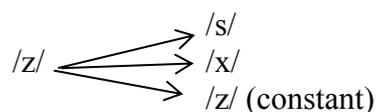
Some Indonesia phonemes as used in the adopted words could replace more than one English phonemes. They are /f/, /g/, /p/, /s/, /t/, /x/, and /y/. This can be checked in the presentation of phonological replacement of consonant phonemes above.

One English consonant phoneme may be represented by one to six orthographic forms and these orthographic forms are different from the phonetic symbols of most of the vowels phonemes here. This phenomenon does not happen in Indonesian since one phoneme may only be represented by one orthographic from and the phonetic symbols are the same as the orthographic forms in Indonesian.

Some of the words used as examples above are derivative words. Example: the word "sadism" /sei'dizəm/ becomes "sadism", suffix /izəm/ represented by <u>ism</u> is available in this word and phoneme /z/ in this adopted word "sadisme".

Phonemes /q/, /x/, and /c/ are not found to be used in English words (based on the Collins dictionary, 1986), but two of them are used in the adopted words (Indonesian words) : phonemes /x/ and /c/. These two phonemes replace some English phonemes as follows:

/z/   /z/ → /zailəfəun/ → (xilofon)
/x/   /eks/   /eksræi/ (X-ray)
 /c/ /t∫/   /t∫ek/ → /cek/

The reality that phonemes /q/, /x/, and /c/ are not found to be used in English words is strengthened by a comment given by Lowe (1987: 256) "...There are fifty main sounds according to Webster's International Dictionary. There are only twenty three effective letters in English alphabets (c, q, x do not symbolize a phoneme)...". This statement is supported by Ellison (1985: 585) as he says "…. Bearing in mind q, c, and x, are superfluous since their sounds can be represented by other letters". This section contains the summary of phonological replacement:

Replacing		Replaced phonemes (English phonemes)

/a/←   /i/ (I, e, a, y), /æ/ (a), /ə/ (e, a), /a:/ (a, aa),
     /e/ (e), /ei/ (a), /ɪo/ (a), /a/ (o)
/i/ ← /i/ (I, y, u),   /i:/ (I, ea), /juə/ (u), /ai/(i)
     /ə/ (ia, oi, io)
/u/ ← /u/(u),,/u:/(o, oo, ou), /ʌ/(u), /juə/
      (u,uu), /ɜ:/ (u, ou),   /ju:/ (u), /ə/ (u, o),
     /au/ (ou), /uə/ (ou), /ju/ (u)
/e/ ← /e/ (e, ue), /i/ (e), /ia/ (ea), /ɜ:/ (e/r),
        /∂/ (e), /i:/ (oe, ae, e), /ɔ:/ (au, a),
/o/ ← /ɪo/ (o), /∂/ (o), /∂u/ (ou, oo, oa)
/f/ ← /f/ (f, ff, ph), /v/ (v)

/g/ ← /g/ (g, gg, gh), /dj/ (g, gg)
/p/ ← /p/ (p, pp), /v/ (v), /f/ (ph)
/s/ ← /s/ (c, s, sc), /ʃ/ (c, ch, ss, t), /z/ (s), /j/ (s), /dj/ (g), /k/ (c)
/t/ ← /t/ (t, tt), /θ/ (yh), /đ/ (th)
/x/ ← /x/ (x), /z/ (x)
/y/ ← /j/ (j, y), /i/ (y), /dĵ/ (j, y)

Next, we can see some overlapping occurs in the presentation of phonological replacement above. Some of the English phonemes could be replaced by more than one Indonesian phonemes, as follows:

/a/, /i/, /e/	←/i/	(i, e, a, u, y)
/a/, /i/,/u/,/e/, /o/	←/ə/	(a, e, u)
/a/, /o/	←/ɒ/	(a, o)
/i/, /e/	←/i:/	(e, I, ea, ae, oe)
/i/, /u/	←/juə/	(u, uu)
/u/, /e/	←/ɜ:/	(e/r, u, ou)
/f/, /p/	←/f/	(f, ff, ph)
/g/,/j/,/s/,/y/	←/dĵ/	(g, gg, j, dg,y)
/k/, /s/	← /k/	(c, cc, ch, k, q)
/f/, /p/, /v/	←/v/	(v)
/s/,/x/,/z/	←/z/	(x, s)

Before coming into conclusions it is necessary to stress some important points that have been revealed from the data analysis performed in the previous section. Besides the English phonemes that undergo phonological replacement, there are also some phonemes that are constant in the process of words adoption.

The five vowel phonemes in Indonesian could replace twenty two phonemes in æ æ English (single vowels, some diphthongs). Among the twenty-two phonemes, eighteen phonemes of them undergo phonological replacement and four phonemes are constant.

Among the twenty three English consonants phonemes, nine phonemes of them undergo phonological replacement and the others are constant. Phoneme /q/ is excluded from this consideration since it does not replace any sound in the adopted words. Phonological replacement covers great number of phonemes. It covers twenty seven phonemes.

3.3. Formula of Phonological Replacements

The findings of this research show that some phonological replacements tend to be permanent, and this is a good reason to establish them as formulas of phonological replacement, as follows:

phoneme /i/ is replaced by phonemes /a/, /i/, and /e/
phoneme /i:/ is replaced by phonemes /i/ and /e/

phoneme /æ/ is replaced by phoneme /a/

phoneme /ə/ is replaced by phonemes /a/, /i/, /u/, /e/, and /o/
phoneme /ɜ:/ is replaced by phonemes /e/, and /u/
phoneme /e/ is replaced by phonemes /a/ and /e/
phoneme /ˌo/ is replaced by phonemes /a/ and /o/
phoneme /ʌ/ is replaced by phoneme /u /

phoneme /ɔ:/ is replaced by phoneme /o/
phoneme /a:/ is replaced by phoneme /a/
phoneme /u:/ is replaced by phoneme /u/
diphthong /ei/ is replaced by phoneme /a/
diphthong /u / is replaced by phonemes /i/ and /u/
diphthong /ai / is replaced by phonemes /i/
diphthong /au / is replaced by phonemes /u/
diphthong /iə/ is replaced by phonemes /e/
diphthong / u / is replaced by phonemes /o/
phoneme /f / is replaced by phonemes /f/ and /p/
phoneme /dj /is replaced by phonemes /g/, /y/, and /s/
phoneme /j/ is replaced by phoneme /s /
phoneme /k/ is replaced by phonemes /s/ and /k/
phoneme /ʃ/ is replaced by phoneme /s/
phoneme /z/ is replaced by phonemes /s/ and /x/
phoneme /v/ is replaced by phoneme /p/
phoneme / θ / is replaced by phoneme /t/
phoneme /   / is replaced by phoneme /t/

4. Conclusion

Based on the data analysis presented in the previous section, some conclusions could be drawn in this section. In the process of words adoption from foreign languages (primarily from English) to Indonesian, some phonemes in the adopted words undergo phonological replacement and some are constant. Eighteen Vowel phonemes and nine consonant phonemes of English undergo phonological replacement.

Phonological replacement occurs only on the English phonemes that are not available in Indonesian. Constant phonemes automatically do not undergo phonological replacement. The replacing phonemes from Indonesian generally have almost the same sound as the replaced phonemes from English.

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