

Multiword-Expressions and Precise Translation from Swahili to English

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Abstract

The isolation of multiword expressions (MWE) is necessary in the process of machine translation. This paper discusses various types of MWEs in the context of machine translation from Swahili to English. The isolation of MWEs was done using the REPLACE and ADD operators of the CG-2 parser. The examples show that it is possible to handle the MWEs so that the correct translation is constructed from each type of MWE.

Introduction

From the viewpoint of machine translation, multiword expressions must be identified and handled in the way that the translation result is correct. There is not much point in arguing which set of words constitutes a multiword expression. The translation task itself sets the criteria for treating a certain set of words as a multiword expression or as a set of individual words. If a set of words can be translated so that the translation of each word separately produces a satisfactory translation, the set of words is not a multiword expression. On the other hand, if such word-by-word translation is not possible, the set of words constitutes a multiword-expression.

Multiword expressions form two main groups: frozen MWEs and inflecting MWEs. Frozen MWEs do not inflect, their word order is fixed, and they are continuous, in other words, their members do not allow other words in between. They are often adverbs, prepositions or adjectives. Because of this non-inflecting nature, they are rather easy to isolate and handle in translation

Each inflecting MWE constitutes a semantic unit with one or more meanings. The context-sensitive meaning must be transferred to the target language. But it is not only the lexical level meaning but also syntax level meaning that must be transferred. Such syntax level features in verbs are time/aspect information, subject marking, noun-class, relative and object marking and verb extensions. On the part of nouns, distinctions between singular and plural, animacy and inanimacy, sex, and noun class must be retained. When a word cluster is given a joint meaning, distinct from the meaning of any members of the cluster, this must be done so that all relevant grammatical information inherited from the source language is retained. At the same time all now redundant information attached to the individual words must be removed

It is also possible that the MWE is not a continuous set of words. A word or several words may intervene between members of a MWE. In these intervening words all information must be retained so that their translation becomes possible.

1. How to implement MWEs

In rule-based machine translation, each word form is first analysed and given all grammatically correct interpretations. This results in ambiguity on the part of most words. It is better to isolate MWEs before disambiguation proper is performed. The undisambiguated analysis result contains the maximum amount of ambiguity and provides all necessary information for writing isolation rules.

Rules for isolating MWEs can be written in various ways. This paper is written using Constraint Grammar rules for the job. CG-2 has the ADD and REPLACE operations suitable for different kinds of isolation rules. The ADD operation makes it possible to add tags to a reading without removing existing information. The REPLACE operation removes all the existing information except the lemma, and gives a new interpretation.

The use of these two operators is such that if no grammatical information from the source language needs to be retained, REPLACE is the suitable operator. It removes all old information and replaces it with

new information. MWEs as adverbs, prepositions and adjectives can be implemented with the REPLACE operator.

Whenever there is need to retain information from the source language, the ADD operator is suitable. It keeps all the information on the target word and adds whatever needs to be added. Typically the added information contains at least the new gloss of the whole multiword expression. While there is now the original gloss and the new gloss, the original gloss must be removed while other grammatical information is retained.

What happens to the other members of the MWE? The gloss and all grammatical information on them will be removed. Now all the information needed for translating the MWE is on one single target word. The word to be chosen as target must be carefully thought of, so that the expression will be inflected in the correct way. For example, if the MWE has a verb as a member, it is the verb that must be selected as the target. If the MWE is a name of a ministry or organisation, the head word in the name must be chosen as the target. If the MWE is a frozen word cluster, it does not matter which word is chosen as a target, because there is no inflection. One must only remember that other members of the MWE are 'killed'.

2. Examples of frozen MWEs

In (1) is an analysis result of the combination of words *juzi asubuhi*. It should be translated as '*the day before yesterday in the morning*'.

```
(1)
"<alikuja>"
    "ja" V 1/2-SG3-SP VFIN { he } PAST INFMARK z [ja] { come } SV MONOSLB
    "ja" V 1/2-SG3-SP VFIN { she } PAST INFMARK z [ja] { come } SV
MONOSLB
"<juzi>"
    "juzi" N 5/6-SG { the } { day before yesterday }
    "juzi" ADV { the day before yesterday } TIME
"<asubuhi>"
    "asubuhi" N 9/10-SG { the } { morning }
    "asubuhi" N 9/10-PL { the } { morning }
    "asubuhi" ADV { in the morning } TIME
```

As we see from the readings, both *juzi* and *asubuhi* contain an adverbial (ADV) interpretation with appropriate translation. There are two methods for handling the problem. In one solution we select the ADV reading of both words. This is demonstrated in (2)

```
(2)
"<alikuja>"
    "ja" V 1/2-SG3-SP VFIN { he } PAST INFMARK z [ja] { come } SV MONOSLB
    "ja" V 1/2-SG3-SP VFIN { she } PAST INFMARK z [ja] { come } SV
MONOSLB
"<juzi>"
    "juzi" ADV { the day before yesterday } TIME
"<asubuhi>"
    "asubuhi" ADV { in the morning } TIME
```

The other method is to isolate these two words as a multiword expression (3).

```
(3)
"<alikuja>"
    "ja" V 1/2-SG3-SP VFIN { he } PAST INFMARK z [ja] { come } SV MONOSLB
"<juzi>"
    "juzi" MW>
"<asubuhi>"
    "asubuhi" ADV <MW { the day before yesterday in the morning } TIME
```

The final translation is in (4)

(4)

He came the day before yesterday in the morning

In most cases MWEs cannot be translated by using disambiguation rules. Such an example is in (5).

(5)

```
"<kwa>"
    "kwa" PREP { with }
    "kwa" PREP { for }
    "kwa" PREP { to }
    "kwa" PREP { by }
    "kwa" PREP { on }
    "kwa" PREP { in }
    "kwa" PREP { from }
    "kwa" PREP { at }
    "kwa" GEN-CON-KWA 15-SG { of }
    "kwa" GEN-CON-KWA 17-SG { of }
"<mapana>"
    "mapana" N 6-PLSG { width }
    "pana" ADJ A-INFL 5/6-PL { wide , broad }
"<na>"
    "na" CC { and }
    "na" AG-PART { by }
    "na" PREP { with }
    "na" NA-POSS { of }
    "na" ADV NOART { past }
    "na" ADV { also }
"<marefu>"
    "marefu" N 6-PLSG { length }
    "refu" ADJ A-INFL 5/6-PL { long , tall , lasting }
    "refu" ADJ A-INFL 5/6-PL { deep }
```

All words in (5) have more than one interpretation, and even if disambiguation would be attempted, the correct meaning *'in all aspects'* could not be constructed. The only solution is to isolate the expression and give it a new meaning (6).

(6)

```
"<<s>>"
    "<s>" { <s> }
"<kwa>"
    "kwa" MW>>>
"<mapana>"
    "mapana" MW<>>
"<na>"
    "na" MW<<>
"<marefu>"
    "marefu" ADV <<<MW { in all aspects }
```

Also adjectival expressions can be treated as MWEs. Consider the example in (7).

(7)

```
"<shughuli>"
    "shughuli" N 5/6-SG { the } { activity , business , occupation }
    "shughuli" N 9/10-SG { the } { activity , business , occupation }
    "shughuli" N 9/10-PL { the } { activity , business , occupation }
```

```
"<za>"
    "za" GEN-CON 9/10-PL { of }
"<kuleta>"
    "leta" V INF { to } z [leta] { bring , hand , fetch } SVO
    "leta" N 15-SG z [leta] { bring , hand , fetch } SVO
    "leta" V INF MOD-CAN z [leta] { bring , hand , fetch } SVO
    "leta" V INF NO-TO z [leta] { bring , hand , fetch } SVO
"<faida>"
    "faida" N 9/10-SG { the } { profit }
    "faida" N 9/10-PL { the } { profit }
```

The sequence of words *za kuleta faida* is an adjectival expression meaning 'lucrative'. It is isolated as shown in (8)

```
(8)
"<shughuli>"
    "shughuli" N 9/10-PL { the } { activity }
"<za>"
    "za" MW>>
"<kuleta>"
    "leta" MW<>
"<faida>"
    "faida" ADJ <<MW { lucrative }
```

The full translation is in (9)

```
(9)
The lucrative activities
```

The adjectival expression itself is half-frozen. It stays as adjective but its first member, here *za*, may have several forms depending on the class of the head noun. Consider the example in (9).

```
(9)
"<shughuli>"
    "shughuli" N 9/10-SG { the } { activity }
"<ya>"
    "ya" MW>>
"<kuleta>"
    "leta" MW<>
"<faida>"
    "faida" ADJ <<MW { lucrative }
```

Here the word *shughuli* is singular, and the translation is as in (10).

```
(10)
The lucrative activity
```

The translation system is constructed so that first the MWE is isolated, as in (11)

```
(11)
"<shughuli>"
    "shughuli" N 5/6-SG { the } { activity }
    "shughuli" N 5/6-SG { the } { business }
    "shughuli" N 5/6-SG { the } { occupation }
    "shughuli" N 9/10-SG { the } { activity }
    "shughuli" N 9/10-SG { the } { business }
    "shughuli" N 9/10-SG { the } { occupation }
```

```

"shughuli" N 9/10-PL { the } { activity }
"shughuli" N 9/10-PL { the } { business }
"shughuli" N 9/10-PL { the } { occupation }
"<ya>"
"ya" GEN-CON 3/4-PL { of }
"ya" GEN-CON 9/10-SG { of }
"ya" GEN-CON 5/6-PL { of }
"ya" GEN-CON 6-PLSG { of }
"<kuleta>"
"leta" V INF { to } z [leta] { bring } SVO
"leta" V INF { to } z [leta] { hand } SVO
"leta" V INF { to } z [leta] { fetch } SVO
"leta" N 15-SG z [leta] { bring } SVO
"leta" N 15-SG z [leta] { hand } SVO
"leta" N 15-SG z [leta] { fetch } SVO
"leta" V INF MOD-CAN z [leta] { bring } SVO
"leta" V INF MOD-CAN z [leta] { hand } SVO
"leta" V INF MOD-CAN z [leta] { fetch } SVO
"leta" V INF NO-TO z [leta] { bring } SVO
"leta" V INF NO-TO z [leta] { hand } SVO
"leta" V INF NO-TO z [leta] { fetch } SVO
"<faida>"
"faida" ADJ <<MW { lucrative }

```

The target is the last member *faida*, and its original meaning is replaced with the new adjective *lucrative*. Other members of the MWE are still intact, and disambiguation rules can be applied. These rules select the singular interpretation of *shughuli*, because the tag *9/10-SG* is the only tag common in *shughuli* and *ya*. After this the now redundant members of the MWE can be marked as part of the MWE, on the basis of the MWE pattern <<MW on *faida* (12).

```

(12)
"<shughuli>"
"shughuli" N 9/10-SG { the } { activity }
"<ya>"
"ya" MW>>
"<kuleta>"
"leta" MW<>
"<faida>"
"faida" ADJ <<MW { lucrative } @<NADJ

```

A noun of any noun class as the head produces correct translation. Consider the example in (13)

```

(13)
"<mambo>"
"jambo" N 5/6-PL { the } { matter }
"<ya>"
"ya" MW>>
"<kuleta>"
"leta" MW<>
"<faida>"
"faida" ADJ <<MW { lucrative } @<NADJ

```

Here *ya* refers to a plural noun. The translation is in (14).

```

(14)
The lucrative matters

```

3. Examples of inflecting MWEs

The above examples are fairly simple. Matters become more complicated, when a verb is part of the MWE. Such idiomatic expressions are common in Swahili, and some verbs as *piga* and *tia* are frequently a member in a MWE. Consider the example in (15).

(15)

```
"<katibu>"
  "tibu" V HORT-COLLOQ:ka-e VFIN z [tibu] { cure , treat , heal } SVO
  "tibu" V NARR-COLLOQ:ka-a VFIN z [tibu] { cure , treat , heal } SVO
  "katibu" N 9/6-SG { the } { secretary , amanuensis } MALE HUM
"<alipiga>"
  "piga" V 1/2-SG3-SP VFIN { he } PAST z [piga] { hit , beat } SVO ACT
  "piga" V 1/2-SG3-SP VFIN { she } PAST z [piga] { hit , beat } SVO ACT
  "piga" V 1/2-SG3-SP VFIN { he } PR:a 5/6-SG-OBJ OBJ { it } z [piga] {
hit , beat } SVO ACT
  "piga" V 1/2-SG3-SP VFIN { she } PR:a 5/6-SG-OBJ OBJ { it } z [piga]
{ hit , beat } SVO ACT
"<konde>"
  "konde" N 5/6-SG { the } { plantation , cultivated land , call to a
:person working in a :field before greating }
  "konde" N 5/6-SG { the } { fist }
"<la>"
  "la" EXCLAM { no , not }
  "la" GEN-CON 5/6-SG { of }
"<nyuma>"
  "nyuma" N 9/10-SG { the } { behind , past , former }
  "nyuma" N 9/10-PL { the } { behind , past , former }
  "uma" N 11/10-PL { the } { fork }
  "nyuma" ADV { behind }
```

When the isolation rules are applied, we get the following (16).

(16)

```
"<katibu>"
  "katibu" N 9/6-SG { the } { secretary } MALE HUM @SUBJ
"<alipiga>"
  "piga" V 1/2-SG3-SP VFIN NO-SP-GLOSS PAST z [piga] { bribe } SVO ACT
>>>MW @FMAINVtr-OBJ>
"<konde>"
  "konde" MW<>>
"<la>"
  "la" MW<<>
"<nyuma>"
  "nyuma" MW<<<
```

The sequence *alipiga konde la nyuma* is interpreted as *bribe*. The full translation is in (17).

(17)

The secretary bribed

If we put the verb in passive we get the result as in (18).

(18)

```
"<katibu>"
  "katibu" N 9/6-SG { the } { secretary } MALE HUM @PAT
"<alipigiwa>"
  "pigiwa" V 1/2-SG3-SP VFIN NO-SP-GLOSS PAST z [piga] { bribe } SVO
ACT APPL PASS >>>MW @FMAINVtr-OBJ>
```

```
"<konde>"  
    "konde" MW<>>  
"<la>"  
    "la" MW<>>  
"<nyuma>"  
    "nyuma" MW<<<
```

The final translation is in (19).

(19)
The secretary was bribed

All these different forms can be produced with a single isolation rule. If the base form [*piga*] is selected as a target, in stead of a stem as "*piga*" or "*pigiwa*", the rule applies to all extended verb forms, because the base form does not change.

4. Overlapping rules

In constructing isolation rules one has to be careful, so that only one rule applies to a reading. The operators in CG-2 function so that REPLACE is applied only once, while ADD is applied an unlimited number of times. This is demonstrated in (20).

```
(20)  
"<katibu>"  
    "katibu" N 9/6-SG { the } { secretary } MALE HUM @PAT  
"<alipigiwa>"  
    "pigiwa" V 1/2-SG3-SP VFIN NO-SP-GLOSS PAST z [piga] { hit with a  
fist } SVO ACT APPL PASS V >MW @FMAINVtr-OBJ>  
"<konde>"  
    "konde" MW<
```

The example (20) contains a MWE *alipigiwa konde* meaning *hit with a fist*. Why did this rule not apply in the earlier example, because it is part of the longer expression? This would have applied if the rule would not have a constraint that blocs its application if the reading already has a MW tag. The longer rules are applied first, and the shorter rules follow. These shorter rules are provided with a constraint that prevents their application of any earlier rule has already applied. Therefore we get the correct translation as in (21).

(21)
The secretary was hit with a fist

5. Non-continuous inflecting MWEs

Some MWEs allow modifiers between the members of a MWE. Consider the basic structure of a MWE in (22).

```
(22)  
"<katibu>"  
    "tibu" V HORT-COLLOQ:ka-e VFIN z [tibu] { cure , treat , heal } SVO  
    "tibu" V NARR-COLLOQ:ka-a VFIN z [tibu] { cure , treat , heal } SVO  
    "katibu" N 9/6-SG { the } { secretary , amanuensis } MALE HUM  
"<alipiga>"  
    "piga" V 1/2-SG3-SP VFIN { he } PAST z [piga] { hit , beat } SVO ACT  
    "piga" V 1/2-SG3-SP VFIN { she } PAST z [piga] { hit , beat } SVO ACT
```

```

    "piga" V 1/2-SG3-SP VFIN { he } PR:a 5/6-SG-OBJ OBJ { it } z [piga] {
hit , beat } SVO ACT
    "piga" V 1/2-SG3-SP VFIN { she } PR:a 5/6-SG-OBJ OBJ { it } z [piga]
{ hit , beat } SVO ACT
"<simu>"
    "simu" N 9/10-SG { the } MW-CAND { telephone , :telephone message }
    "simu" N 9/10-SG { the } { type of sardine or sprat } AN
    "simu" N 9/10-PL { the } MW-CAND { telephone , :telephone message }
    "simu" N 9/10-PL { the } { type of sardine or sprat } AN

```

After isolation of the MWE the expression looks like in (23).

(23)

```

"<katibu>"
    "katibu" N 9/6-SG { the } { secretary } MALE HUM @SUBJ
"<alipiga>"
    "piga" V 1/2-SG3-SP VFIN NO-SP-GLOSS PAST z [piga] { call } SVO ACT V
x+>MW @FMAINVtr-OBJ>
"<simu>"
    "simu" MWx+<

```

The final translation is in (24).

(24)

The secretary called

We see that the target *[piga]* has a MWE structure $x+>MW$. This means that after target there can be one or more words that are not part of the MWE, and after them there is one word that is part of the MWE. The new meaning of the MWE will be attached to the target, and the original meaning of the last member of the MWE will be removed. These processes will be demonstrated below.

(25)

```

"<katibu>"
    "tibu" V HORT-COLLOQ:ka-e VFIN z [tibu] { cure , treat , heal } SVO
    "tibu" V NARR-COLLOQ:ka-a VFIN z [tibu] { cure , treat , heal } SVO
    "katibu" N 9/6-SG { the } { secretary , amanuensis } MALE HUM
    "tibu" HORT-COLLOQ:ka-e VFIN z [tibu] { cure , treat , heal } SVO
    "tibu" NARR-COLLOQ:ka-a VFIN z [tibu] { cure , treat , heal } SVO
"<alimpigia>"
    "pigia" V 1/2-SG3-SP VFIN { he } PAST 1/2-SG3-OBJ OBJ { him/her } z
[piga] { hit , beat } SVO ACT APPL
    "pigia" V 1/2-SG3-SP VFIN { she } PAST 1/2-SG3-OBJ OBJ { him/her } z
[piga] { hit , beat } SVO ACT APPL
"<msaidizi>"
    "msaidizi" N 1/2-SG HUM { the } { assistant , helper , accessory }
    "saidizi" ADJ A-INFL 1/2-SG { auxiliary }
    "saidizi" ADJ A-INFL 1/2-SG { benevolent }
    "saidizi" ADJ A-INFL 1/2-SG { subordinate }
    "saidizi" ADJ A-INFL 1/2-SG { subsidiary }
    "saidizi" ADJ A-INFL 3/4-SG { auxiliary }
    "saidizi" ADJ A-INFL 3/4-SG { benevolent }
    "saidizi" ADJ A-INFL 3/4-SG { subordinate }
    "saidizi" ADJ A-INFL 3/4-SG { subsidiary }
    "saidizi" ADJ A-INFL 11-SG { auxiliary }
    "saidizi" ADJ A-INFL 11-SG { benevolent }
    "saidizi" ADJ A-INFL 11-SG { subordinate }
    "saidizi" ADJ A-INFL 11-SG { subsidiary }
    "saidizi" ADJ A-INFL LOC-18 { auxiliary }

```

```

"saidizi" ADJ A-INFL LOC-18 { benevolent }
"saidizi" ADJ A-INFL LOC-18 { subordinate }
"saidizi" ADJ A-INFL LOC-18 { subsidiary }
"<wake>"
"mke" N 1/2-PL HUM { the } { wife }
"ake" PRON POSS 1/2-SG SG3 { his/her }
"ake" PRON POSS 1/2-PL SG3 { his/her }
"ake" PRON POSS 3/4-SG SG3 { his/her/its }
"ake" PRON POSS 11-SG SG3 { his/her/its }
"ake" PRON POSS 3/4-SG SG3 <PRE { him/her/it }
"ake" PRON POSS 11-SG SG3 <PRE { him/her/it }
"ake" PRON POSS 1/2-SG SG3 <PRE { him/her/it }
"ake" PRON POSS 1/2-PL SG3 <PRE { him/her/it }
"<simu>"
"simu" N 9/10-SG { the } MW-CAND { telephone , :telephone message }
"simu" N 9/10-SG { the } { type of sardine or sprat } AN
"simu" N 9/10-PL { the } MW-CAND { telephone , :telephone message }
"simu" N 9/10-PL { the } { type of sardine or sprat } AN

```

In the example above (25), the verb [*piga*] is in applicative form "*pigia*" meaning that the expression contains also an indirect object *msaidizi*, while *simu*, which is part of the MWE, is the direct object. When the MWE is isolated, the result looks like in (26)

```

(26)
"<katibu>"
"katibu" N 9/6-SG { the } { secretary } MALE HUM @SUBJ
"<alimpigia>"
"pigia" V 1/2-SG3-SP VFIN NO-SP-GLOSS PAST 1/2-SG3-OBJ OBJ NO-OBJ-
GLOSS z [piga] { call } SVO ACT APPL V x+>MW @FMAINVtr+OBJ>
"<msaidizi>"
"msaidizi" N 1/2-SG HUM { the } { assistant } @OBJ
"<wake>"
"ake" PRON POSS 1/2-SG SG3 { his/her } @GCON
"<simu>"
"simu" MWx+<

```

In (26), the intervening words *msaidizi* and *wake* are kept intact, while *simu* is marked as part of the MWE. This works also when there is a longer phrase in between (27).

```

(27)
"<kiongozi>"
"kiongozi" N 7/8-SG { the } { leader } AN HUM @SUBJ
"<aliwapigia>"
"pigia" V 1/2-SG3-SP VFIN NO-SP-GLOSS PAST 1/2-PL3-OBJ OBJ NO-OBJ-
GLOSS z [piga] { call } SVO ACT APPL V x+>MW @FMAINVtr+OBJ>
"<wafanyakazi>"
"mfanyakazi" N 1/2-PL HUM { the } { worker } @OBJ
"<wake>"
"ake" PRON POSS 1/2-PL SG3 { his/her } @GCON
"<wote>"
"ote" PRON :OTE 1/2-PL { all }
"<watatu>"
"tatu" NUM 1/2-PL NUM-INFL CARD { three }
"<simu>"
"simu" MWx+<

```

The final translation is in (28).

(28)

The leader called his/her all three workers

6. Long named entities

Ministries and public organisations may have long names and they are often written with capital-initial letters. They must be treated as MWEs. Because they constitute a noun, they must be isolated so that the morphological information of the head noun is retained for making the correct translation of the sentence possible. Consider the example in (29).

(29)

```
"<*waziri>"
  "waziri" N 9/6-SG { the } { *minister } MALE HUM CAP
  "*waziri" N TITLE { *minister } AN HUM

"<wa>"
  "wa" GEN-CON 3/4-SG { of }
  "wa" GEN-CON 11-SG { of }
  "wa" GEN-CON 1/2-SG { of }
  "wa" GEN-CON 1/2-PL { of }

"<*mambo>"
  "jambo" N 5/6-PL { the } { matter , business , circumstances } CAP

"<ya>"
  "ya" GEN-CON 3/4-PL { of }
  "ya" GEN-CON 9/10-SG { of }
  "ya" GEN-CON 5/6-PL { of }
  "ya" GEN-CON 6-PLSG { of }

"<*nje>"
  "nje" ADV { outside } CAP

"<na>"
  "na" CC { and }
  "na" AG-PART { by }
  "na" PREP { with }
  "na" NA-POSS { of }
  "na" ADV NOART { past }
  "na" ADV { also }

"<*ushirikiano>"
  "ushirikiano" N 11/6-SG { the } { cooperation } CAP

"<wa>"
  "wa" GEN-CON 3/4-SG { of }
  "wa" GEN-CON 11-SG { of }
  "wa" GEN-CON 1/2-SG { of }
  "wa" GEN-CON 1/2-PL { of }

"<*kimataifa>"
  "kimataifa" ADV { internationally } CAP
  "taifa" ADV ADV:ki 5/6-PL { the } { nation } CAP
```

The result after applying isolation rules is in (30)

(30)

```
"<*waziri>"
  "waziri" N 9/6-SG { the } { *minister of *foreign *affairs et
  *international *co-operation } MALE HUM CAP >>>>>>>MW >>>>MW { *foreign
  *minister }

"<wa>"
  "wa" MW<>>>

"<*mambo>"
  "jambo" MW<<>>

"<ya>"
  "ya" MW<<<>

"<*nje>"
```

```

    "nje" MW<<<<<
"<na>"
    "na" MW<<<<<>>
"<*ushirikiano>"
    "ushirikiano" MW<<<<<>>
"<wa>"
    "wa" MW<<<<<>>
"<*kimataifa>"
    "kimataifa" MW<<<<<<<<

```

We see that two rules have applied, one for isolating the longer expression and another for the shorter expression *Waziri wa Mambo ya Nje*. This must be fixed so that if the longer rule has applied, the shorter one cannot apply. When this is done, the result looks like in (31).

(31)

```

"<*waziri>"
    "waziri" N 9/6-SG { the } { *minister of *foreign *affairs et
*international *co-operation } MALE HUM CAP >>>>>>>MW
"<wa>"
    "wa" MW<>>>>>>>
"<*mambo>"
    "jambo" MW<<>>>>>>>
"<ya>"
    "ya" MW<<<>>>>>>>
"<*nje>"
    "nje" MW<<<<<>>>>>
"<na>"
    "na" MW<<<<<>>>>>
"<*ushirikiano>"
    "ushirikiano" MW<<<<<<<>>
"<wa>"
    "wa" MW<<<<<<<>>
"<*kimataifa>"
    "kimataifa" MW<<<<<<<<<

```

The final translation is in (32).

(32)

The Minister of Foreign Affairs and International Co-operation

The MWE can also be in plural (33)

(33)

```

"<*mawaziri>"
    "waziri" N 9/6-PL { the } { *minister of *foreign *affairs et
*international *co-operation } MALE HUM CAP >>>>>>>MW
"<wa>"
    "wa" MW<>>>>>>>
"<*mambo>"
    "jambo" MW<<>>>>>>>
"<ya>"
    "ya" MW<<<>>>>>>>
"<*nje>"
    "nje" MW<<<<<>>>>>
"<na>"
    "na" MW<<<<<>>>>>
"<*ushirikiano>"
    "ushirikiano" MW<<<<<<<>>

```

