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International Conference on Computer Systems
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The Implementation Of Post Editing Method On The Translator Application To Identify The Ambiguous Sentences

Dewi Soyusiawaty

Abstract — In the daily life, there are many words or sentences having ambiguous meaning. The word 'batu' could have two different meanings in different sentences. It could mean 1) movement from an upright position to a lower position 2) bankrupt. Ambiguous meaning in the sentences such as 'Pendaftaran anggota baru akan dilaksanakan minggu depan' could mean 1) new member (The new member registration will start next week), and 2) will just start (The member registration will just start next week). The translation system, which is available now, hasn't been able to automatically produce a valid translation output. It needs a collaboration between human and machine. This research discusses the implementation of post editing method to produce a translation as a user means. The research starts by collecting data consisting of basic vocabularies, which have ambiguous meaning, and part of speech both from the source language and the target language. Then, a system need analysis is conducted. This research emphasizes on designing necessary database and user interface related to the interaction between a user and system by post editing process. The implementation is the application produced. The result of the research is the implementation of post editing strategy on the translator application to identify ambiguous sentences to produce valid output sentences as the user means.

Keywords — ambiguous meaning, post editing, translation

1. INTRODUCTION

The Concept of Translation Today, there is no machine-assisted translation system (TMe) that provides fully automatic and valid translation. The one which exists now is translation system involving collaboration between human and machine. The collaborative translation system could be in form of machine-assisted human translation (TMABeM) or human-assisted machine translation (TMeBMA). In TMABeM, translation is done by human with computer assistance in form of: (1) the computer dictionary gives the term's meaning based on the context or the topic of the text; (2) the general dictionary computer which is always updated based on the recent terminology; and (3) the computer which could analyze sentences particularly in form of word morphology (often completed with spelling correction).

In the translation, there are two main processes: (1) receive, understand or analyze a source text, and (2) produce, express or synthesize the target text or translation result. Without correctly understanding the source text, what will be expressed could not be correct. In other words, the translation result doesn't represent the source text or it's not correct. Therefore, the most essential process is correctly understand and analyze the source text. By correctly understanding the source text, the main demand of translation, which is the content or meaning equivalence between the source and the target text, could be achieved. Collaborative translation system which is commonly experimented and got attention of the researchers is TMeBMA system. There are two TMeBMA systems, which are: (1) pre editing type and (2) post editing type. Pre editing type could be described as follows:

In this system, a pre editing actor revises the source text to be understandable and acceptable text for the computer as an input, which is then processed to produce the translation result.

In the post editing type, the source text is processed by the translator computer to produce the translation result which has a lot of mistake. This translation result is examined by human translator, and then is edited to be a common translation result. The process could be described as figure 6. In the raw translation result from computer, there are a lot of mistakes which are especially caused by ambiguity in the source text. [1][3][4][5]

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The Ambiguity in the Natural Language

The ambiguity in the natural language could be differentiated, at least, into three kinds, which are (i) category ambiguity, (ii) semantic ambiguity, and (iii) syntactic ambiguity. The category ambiguity is an ambiguity related to parts of speech, as represented by the word 'water' in English language. Look at the example below:

The water is boiling. [noun] (1)
They water the plant twice a day. [verb] (2)

An example of semantic ambiguity in Indonesian language is the word genting. The meaning of genting in phrase (3) is different to the meaning in the phrase (4).

Peristiwa genting (3)
Atap genting (4)

Another example is the word kali which in Indonesian language has three meanings: (1) river; (2) frequency; dan (3) multiply (mathematic operation). The word kali in the sentences together with words such as dalam (deep), lebar (wide), etc. we will know that kali means 'river'. Therefore, the language context of the word ‘kali’ avoids or solves the ambiguity (disambiguous). Likewise, if the word kali comes together with numbers, the word ‘equal’, etc, we will know that kali means ‘multiply/ relates to mathematical operation’. From the perspective of providing ambiguity, it needs certain ways to solve the ambiguity/disambiguous. In case of lexical ambiguity, disambiguous could be done by marking the meaning with a symbol, for example subscript. For instance the word ‘kali’ in the sentence ‘Bukan tiga kali, tiap empat kali’, the three meaning mentioned above could be possible. Therefore, it can be given ambiguity solving mark as follows:

a) Bukan tiga kali_a [‘sangai’] (river)
b) Bukan tiga kali_B [‘frekuensi’] (frequency)
c) Bukan tiga kali_C [perlokuan matematik] (multiply/ mathematical operation)

The example of syntactic ambiguity could be found in the Indonesian sentences using the word ‘baru’[8], which could be translated as an adjective describing the noun ‘anggota’, also could be translated as an adverb which is related to minggu depan. Pendapatten anggota baru akan kami lakukan minggu depan [8]

However, the ambiguity as shown in (3), (4), and also the following example, could be solved by the computer because there are different characteristic that could be revealed. The word genting (3) is an adjective while genting (4) is a noun. The word memerah (9) is a transitive verb while memerah (10) is an intransitive verb. The word mengandung (11) together with human subject, while mengandung (12) relates to non-human subject (thing).

Pekerjaannya memerah susu sapi. (9)
Wajahnya memerah ketika ia dimarahi. (10)
Ibu sedang mengandung enam bulan. (11)
Garam mengandung potassium dan sodium. (12)

The same case could be found in the potential ambiguous phrase such as : ‘wanita dan laki-laki yang tua itu’, which could mean ‘those old woman and old man’ or ‘those woman and an old man’. This phrase is ambiguous because it can be analyzed by both constituent composition and immediate constituent structure:

a) (((wanita dan laki-laki) yang tua) itu) (those ((woman and man) who are old))
b) (((wanita) dan (laki-laki yang tua) itu) (those ((woman) and (old man)))

However, the following ambiguity is still a problem for the computer because it could just analyze a sentence, not context. The ambiguity such as the example (9) – (12) could be solved only using a sentence analysis.

In an interactive system, there is an interaction between computer and human who uses the computer. In this system, (1) a user types a sentence in the source language, (2) the computer asks some necessary questions, (3) the user answers the questions and (4) the computer produces the sentence in the target language without any necessary post editing. The questions and answers solve the ambiguous words or sentence.

Discussion

A. Data

Core Data needed consisting of:

a. Basic Vocabulary from a to z. A physical dictionary is a word collection which is arranged and translated to the target language.

b. Part of Speech. There are 12 parts of speech, which are nominal, adverbs, verbal, verbs, adjectives, pronouns, numbers, articles, question words, etc. [12]

c. Compound words. Words are combined and have one new meaning. As identified, there are more than 300 compound words in Indonesian language and the translation in the target language. For instance rumah makan, kapur sirih, air mancur, air mata, etc.

d. Homonym. One part of ambiguous varieties is lexical ambiguity, which is a word that is written and spelled the same way but has different meaning. As identified, there are more than 250 homonym words. For instance, the word ‘tahu’ could mean understand or a food name made of soy bean. ‘Apel’ could mean a fruit or a ceremony. Bisa could mean able to do something or sneake’s poison, etc.

e. Polysemy. A kind of ambiguous word which represents a same meaning of a word but different in the context. As identified, there are more than 150 polysemy words. For example the word ‘jatuh’ in the sentence ‘Nilai rupiah jatuh’ doesn’t mean something which physically falls from an upright position to a lower one, but it means decrease.

<table>
<thead>
<tr>
<th>No</th>
<th>Word</th>
<th>Category</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Atlas</td>
<td>Nominal</td>
<td>Map Book</td>
</tr>
<tr>
<td>2</td>
<td>Atlas</td>
<td>Nominal</td>
<td>Madras (cloth)</td>
</tr>
<tr>
<td>3</td>
<td>Atlas</td>
<td>Nominal</td>
<td>Neck Bone (Segment)</td>
</tr>
</tbody>
</table>

TABLE I

Homonym Words
4. Table of Regional Word

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<thead>
<tr>
<th>Column Name</th>
<th>Data Type</th>
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</thead>
<tbody>
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<td>Int</td>
</tr>
<tr>
<td>Language_id</td>
<td>Int</td>
</tr>
<tr>
<td>Indonesian_Word_id</td>
<td>Int</td>
</tr>
<tr>
<td>Word</td>
<td>Varchar(25)</td>
</tr>
<tr>
<td>Description</td>
<td>Varchar(255)</td>
</tr>
</tbody>
</table>

5. Table of Compound_Polysemy

<table>
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</thead>
<tbody>
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<td>Description</td>
<td>Varchar(255)</td>
</tr>
</tbody>
</table>

6. Table of Detail_Compound_Polysemy

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<tr>
<td>Indonesian_Word_id</td>
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7. Table of Regional PM

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</thead>
<tbody>
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<td>Int</td>
</tr>
<tr>
<td>PM_id</td>
<td>Int</td>
</tr>
<tr>
<td>Word</td>
<td>Varchar(25)</td>
</tr>
<tr>
<td>Description</td>
<td>Varchar(255)</td>
</tr>
</tbody>
</table>

II. IMPLEMENTATION

1. Data Inputting Page

Data Inputting Page is prepared to input data of Indonesian words both homonym and not homonym with the regional language translation, polysemy words or compound words of Indonesian language, also, with their translation.
The following figure shows the setting of ambiguous words data or homonym. For example, the word ‘Apel’ could mean a noun (N) or a verb (V) with description of ‘buah’ (fruit) and ‘upacara’ (ceremony).

Figure 6 shows the regional words data from Indonesian words.

To input polysemy data or compound words is shown as following figure. A compound word could be inputted if only each word combined in that compound word has already been inputted on the inputing page in the previous Indonesian words data.

After the data of compound words is inputted on the compound word page, then the translation of regional language words could be inputted. The following figure shows the page where regional language compound words are inputted.
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different sign on the translation page showing that word could have more than one alternative translations or ambiguous. For example the word ‘tahu’ as a verb and a noun.

Fig. 11 Alternative translation or Ambiguous meaning

A user could select a translation option based on what he/she actually means. After the editing process, the system will apply the option in the translation result. The same thing happens in ambiguity example in the compound words, as shown on the following figure:

Fig. 12 Translation of Compound Words

The word ‘panjer’ is the first alternative shown by the system as the word ‘uang muka’ inputted. On alternative translation page or ambiguous meaning, there are two optional translations which are 1) panjer and 2) ‘dhuwit’ dan ‘muka’. On the second option, the system shows translation of each word if they aren’t actually a compound word but independent words.
A user could determine the meaning as he/she means. The system will show the translation as selected.

III CONCLUSION

a. Post editing method is one of solutions on developing translator application from one language to another to identify ambiguous sentences.

b. The implementation of post editing method on the translator application aims to get translation result as a user means.

REFERENCES


