AN EVALUATION OF TRANSLATION: A CASE OF ENGLISH-TELUGU MACHINE TRANSLATION

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ABSTRACT

There are not many studies that have been undertaken in the area of the evaluation of Machine Translation involving Indian languages and particularly involving Telugu. The main aim of this dissertation is to evaluate the machine translation output of the English to Telugu machine translation system. We proposed a questionnaire which contained all the source language sentences and their target language output generated by the MT system in two columns. . We asked them to offer their comments on the quality of the machine translation output. Based on this concept, we have analyzed the evaluation done by our respondents. The results of our study are presented in the last.

Aim:

While efforts to develop Machine Translations involving Indian languages are less than a couple of decades old, work in machine Translation between English and Telugu is only one decade old. There are not many studies that have been undertaken in the area of the evaluation of Machine Translation involving Indian languages and particularly involving Telugu. The main aim of this dissertation is to evaluate the machine translation output of the English to Telugu machine translation system. Work in Machine Translation between English and Telugu is being carried out for the first time at CALTS Language Laboratory, University of Hyderabad (G. Umamaheswara Rao, 2003).

Nature and Scope of the Present Study:

Impressed by the nature and scope of the work involved, we proposed to evaluate Machine Translation output of ETMT by presenting it to the native speakers of Telugu who also know English and use English as a medium of higher education. Though MT output consisted of about five thousand sentences, we have selected only one hundred source language sentences.

Methodology:

Giving priority to the simplicity of the structure and length of the source language sentences, we have selected one hundred sentences randomly. We have limited the number of sentences to 100 in view of (a) the absence of standardized/established methods of evaluation; (b) the bilingual- competence of the available respondents; (c) limitations of time which the respondents could spare to us.

We proposed a questionnaire which contained all the source language sentences and their target language output generated by the MT system in two columns. We added another column for the evaluation by the respondents. The respondents do not have any theoretical or practical knowledge of Translation. We asked them to offer their comments on the quality of the machine translation output.

Conceptual framework:

We have relied on Nida's concept of 'Transfer' which involves Structural adjustments and Semantic adjustments. Based on this concept, we have analyzed the evaluation done by our respondents. The results of our study are presented in the last.

Basic Elements in the Computing Machine:

There are three basic elements in a computing machine: (I) the input, (2) the main storage and a processor, and (3) the output. The input machine receives data as they are fed into it. The time and cost required by this process of preparing the text for the machine have been drastically reduced when compared to the preprocessing in traditional translating. In this process an electronic eye passes over the letters, sorts out the distinguishing features, and translates this information into binary-code units.

A computer uses two kinds of material: (I) the background data which are stored in the machine, whether in the main core memory or in some supplementary storage, and (2) instructions on what the machine is to do with the information coming into the machine from input. The machine then makes a series of simple comparisons and calculations and sends the results to an output component.

Methods of Linguistic Analysis:

Though a machine can do only what it has been told precisely to do, it must be capable of analyzing word combinations, which it has never done before. Though the linguist himself actually performs the basic analysis of the source and receptors languages the machine must be able to make discriminating decisions about language structure, for it must translate, not a string of words, but a structure. Moreover, to do so it must be able to identify the boarders of constructions and the key words around which the parts of the sentence may be said to pivot.

Formulation of Questionnaire and Data collection:

Taking one hundred sentences consisting of English originals and Telugu translations, we have prepared a questionnaire and administered it among twenty English- knowing Telugu students pursuing various courses, namely, M.A, M.Phil, and PhD at the University of Hyderabad.

The questionnaire consists of three columns. The first one has English sentences, the second one has machine translation output (Telugu translations) and the third one has blank space in which the respondents give their detailed

comments, on the machine output the respondents were asked to write their responses taking the following questions: (1) Is the translation alright? (2) Is it clearly understandable? (3) Does it require any changes in terms of grammar and/or vocabulary? (4) Is it necessary to redo that translation altogether? (5) How much or what extent the translation is intelligible? (6) What alternative translation do you offer?

Explanation of the data and the relevant observations
We have chosen four factors or criteria for evaluating the Machine output.

1. Acceptability.
2. Unintelligibility.
3. Semantic Adjustments.
4. Structural Adjustments.

1) Acceptability:
By Acceptability we mean the number of instances (out of 100 sentences) in which the respondent-evaluator accepted the translation as natural and closest equivalent of the source sentence.

As is evident from the above table, out of the 100 machine-translated sentences, only 36 (i.e. 36%) have been accepted by the respondents who are native speakers of the Target language. In other words, the equivalence-effect was to the extent of 36% only.

2) Unintelligibility:
By unintelligibility, we mean the situation in which the respondents could not at all understand what the machine translated sentence means. Out of the machine output of one hundred sentences, there are 17 sentences on an average where the respondents could not understood the sentences in a language, which they know as native speakers. Though, this constitutes a small percentage of 17% the developers of ETMT must investigate into the limitations of linguistic competence/ performance of their MT system.

3) Semantic Adjustments:
By Semantic adjustments, we mean the modifications offered by the native speakers in the translation in terms of alternation, deletion or addition of vocabulary items. Semantic adjustments assume that a given vocabulary item of the source language would have more than one equivalent in the target language. However, the translator, either human or machine, ought to consider an equivalent which is consistent with the context in which a word is used. Hence, we recall Nida's concept of verbal consistency verses contextual consistency. Of course, it is a matter of priority: whether to choose an equivalent which is verbally consistent or

contextually consistent. Similarly, as Nida observed one would give priority to heard (colloquial) language over written language.

As per our data 27% of sentences have been semantically adjusted by our respondents. They suggested certain translations of their own. We may list out some specific examples of Semantic Adjustments suggested by our respondents which may be considered by ETMT.

4) Structural Adjustments:

By structural adjustments, we mean modifications that are made in terms of grammatical category such as word order, number, copula, case, adverb, gender preposition and tense and so on.

4a. Word order

By word order, we mean that modifications suggested by the native speakers. As per our data, our respondents made word order changes in 6% of sentences out of one hundred sentences.

4b. Number

According to our respondents' suggestions we have found that 6% of changes in the case of number. These changes are useful to develop ETMT system, to produce acceptable output. Some of them are suggested changes.

4c. Copula

By copula, we mean that deletion of connected in MT output because in Telugu we don't use such copula. Our respondents suggested the deletion of copula.

4d. Case

A glance at the table tells us that 2% of changes or suggestions have been made by our respondents regarding case. In MT output the readers could not find the exact and accurate meanings for the given sentences and hence they suggested modifications.

4e. Adverb

With regard to the use of adverbs, the respondents have suggested changes in 2% of instances out of one hundred sentences.

4f. Tense

In some sentences tense poses a problem. Our data suggest that the machine translation output requires changes in tense in 2% of the total sentences.

4g. Preposition

In this case the respondents suggested the deletion of preposition in MT output, because in Telugu we don't use such kinds of preposition. The respondents have suggested changes in 2% of the entire data.

Our data suggests that the machine-output requires structural adjustments to the extent of 23%. It follows that our ETMT system must be developed in such a way that the horizons of its comparative knowledge of grammars of both source and target language would expand.

Concluding observation:

On the whole, it appears that ETMT requires considerable improvement in terms of training the machine in the area of comparative semantics and syntax of a given pair of languages. Such improvement will reduce the labor of post-editing to a considerable research.

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