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English-Hindi TAM Divergence in Relation to *Anusaaraka*

Neha Maurya, M.A., Ph.D. Scholar
Shubhra Apurve, M.A., Ph.D. Scholar
Manish Singh, M.A., Ph.D. Scholar
Madhavi, M.A., Ph.D. Scholar
Saurabh Srivastav, M.A., Ph.D. Scholar
Ruchi Singh, M.A., Ph.D. Scholar

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Abstract

Tense aspect and modality (TAM) play a crucial role in defining syntactic, semantics and discourse structure in a sentence. The paper looks at TAM-related issues and attempts to formulate rules of their disambiguation in the context of English-Hindi machine translation (MT) system *Anusaaraka*. It is impossible to find out exact one-to-one mapping of each English TAM into Hindi TAM. The present work is in the initial stage. We have worked on total 318 English TAMs, which are introduced with their Hindi TAM. In this paper we have collected the example sentences for each English TAM and translate them into Hindi. Then, we have found tam divergence issues and classify the main issues linguistically. We first check these TAM and found the examples and counter examples from COCA (The Corpus of Contemporary American English). Then, we run these sentences in *Anusaaraka* MT. We have got eight issues like, Perfect continuous markers, Passive to Active, hypothetical mood in English cannot captured in Hindi, would and could do not have any past equivalent in Hindi, modality based divergence, one-to-one and many-to-one mapping in English-Hindi, and rest of the issues which are not covered any specific area, could projected in others group. Thus, the main claim of this paper is to focus on these eight issues and gives the way for solution.

Keywords: Tense, Aspect, Modality, English-Hindi MT, *Anusaaraka*, TAM divergence

1 Introduction

All natural languages are rich in marking Tense, Aspect and modality. These Tense aspect and modality play a crucial role in defining not only syntactic position in a sentence but on semantics and discourse level too. These function together, so these are knowns as TAM. It is a well-known for linguist and computational linguist. They are needed for specifying the information about the world

which is temporal in nature, or tell us something about the status of an action, or about the ability to perform an action. In some languages, they also govern the realization of a particular case marker. Different languages have different systems for marking such temporal including aspectual and modal information. In other words, TAM markers used by different languages don't have a one- to-one correspondence, So this has become a crucial problem in Machine translation. There are number of errors come through TAM markers.

This paper is an attempt to sort out a big issue in Machine translation system through disambiguating TAM issues. It is impossible to find out exact one-to-one mapping of each English TAM into Hindi TAM.

Tense Aspect Modality (TAM)

(1) Ram is going home. => raama ghara jaa rahaa hai.

English TAM : is_ing

Hindi TAM : 0_ rahaa_hai

The present work is in the initial stage. We have worked on total 318 English TAMs, which are introduced with their Hindi TAM. What we did in this paper is we have collected the example sentences for each English TAM and translate them into Hindi. Then, we have found tam divergence issues and classify the main issues linguistically. We first check these TAMs and found the examples and counter examples from COCA (The Corpus of Contemporary American English). Then, we run these sentences in Anusaaraka MT. We have got eight issues like, Perfect continuous markers, Passive to Active, hypothetical mood in English cannot captured in Hindi, would and could do not have any past equivalent in Hindi, modality based divergence, one-to-one and many-to-one mapping in English-Hindi, and rest of the issues which are not covered any specific area, could projected in others group.

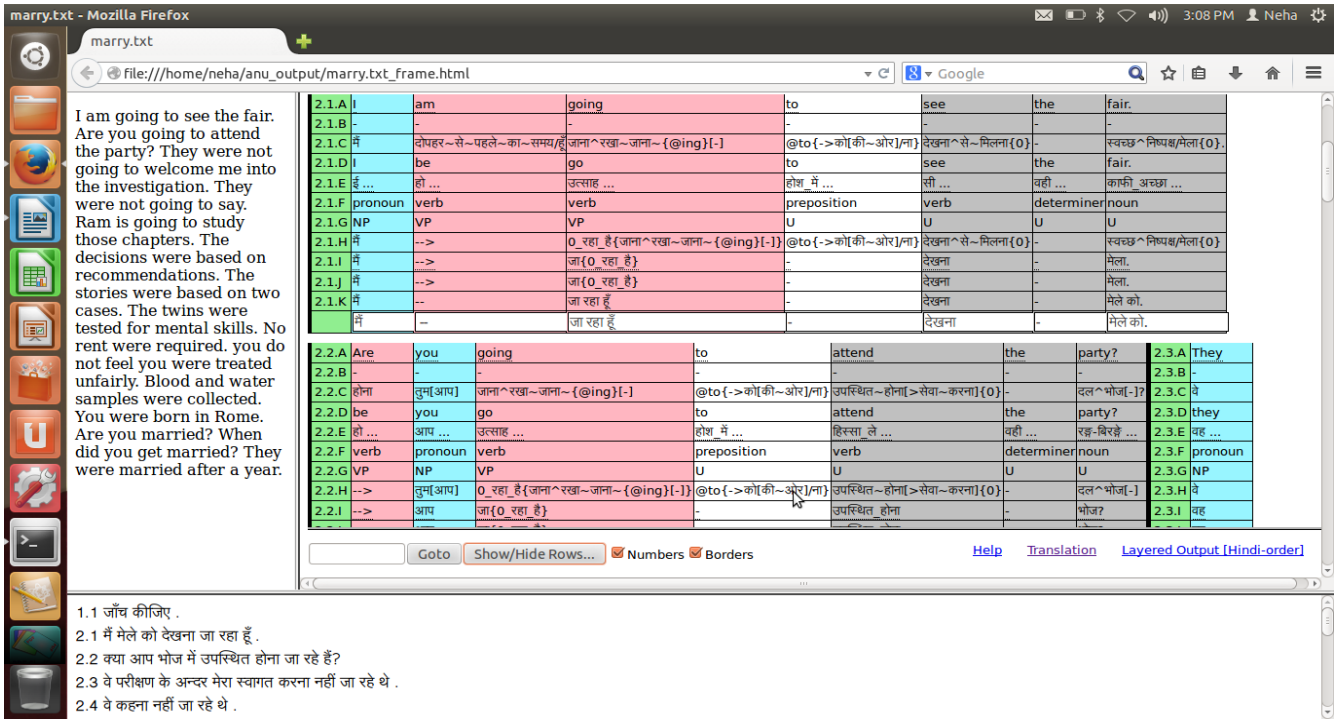
The paper has been organized into five sections excluding acknowledgment and references. The first section is the introduction of the work and it has been divided into two sub parts. The first subpart is the brief introduction of Anusaaraka and the second subpart is about Local word grouping, a crucial issue in free word order languages like Hindi. The second section describes the previous works related TAM. The third section is about English-Hindi TAM. This section is divided into three subsections: Tense, Aspect and Mood. The fourth section is the core part of the paper. It describes TAM Divergence

from English to Hindi translation. The fifth section concludes the paper.

1.1. Anusaaraka

Anusaaraka is an English – Hindi language accessing software. With insights from Panini's *Ashtadhyayi* (Grammar rules), Anusaaraka is a machine translation tool being developed by the Chinmaya International Foundation (CIF), International Institute of Information Technology, Hyderabad (IIIT-H) and University of Hyderabad (Department of Sanskrit Studies). Fusion of traditional Indian shastras and advanced modern technologies is what Anusaaraka is all about. It is a machine translation system with a difference, as it commits to providing the users an output which gives them access to the original text with 100% faithfulness. This is achieved by giving a layered output of how the given English text is translated to Hindi, on line help and user-training. Anusaaraka shall allow users to access text in any Indian language, after translation from the source language (i.e., English or any other regional Indian language). In today's Information Age large volumes of information is available in English – whether it be information for competitive exams or even general reading. However, a lot of the educated masses whose primary language is Hindi or a regional Indian language are unable to access information in English. Anusaaraka aims to bridge this language barrier by allowing a user to enter an English text into Anusaaraka and get the translation of the same in an Indian language. The Anusaaraka being referred to here has English as the source language and Hindi as the target language.

Anusaaraka derives its name from the Sanskrit word '*Anusaran'* which means *'to follow'*. It is so called, as the translated Anusaaraka output appears in layers. The description of these layers is given below. Layer A describes the English words. Layer B describes about those words which are confusing and Machine is unable to decide. The layer C describes Hindi *padasutras*. Layer D describes the root word without any inflectional markers. Layer E describes available Hindi words for corresponding English word in dictionary. Layer F explains the correct part of speech for the English words. Layer G describes chunker marking. Layer H describes all possible word grouping. After word grouping, Layer I describes the exact sense mapping in group. Layer J describes preposition movement while translating English to Hindi. Layer k describes the Hindi generation part for each English word. And the Layer L describes the suggestions from user point of view.



How the Anusaaraka Gives the Layer Output in Browser

1.2. Local Word Grouping

Indian languages are highly in free word order. Still some units are fixed. The most important examples of these are the main verb followed by auxiliary verb sequences and nouns followed by postpositions. We term such units as verb groups and noun groups respectively. It may be noted that verb groups and noun groups will be sub parts of what are called verb phrases and noun phrases respectively. Local word grouping is used to form the word groups on the basis of 'local information' (i.e information based on adjacent words). This LWG has been introduced to reduce the load on the core parser resulting in increased efficiency and simplicity of the overall system.

On the other hand noun groups and verb groups can be formed using only local/surface information and more importantly they provide sufficient information (viz. 'prayoga' and 'vibhakti transformation rules') for further processing of the sentence according to Paninian *kaaraka* theory. So the local word grouping provides all the necessary information with minimum computational effort. The following example illustrates the job done by the LWG. In the following sentence in Hindi:

am+go+ing

Helping Verb + Main Verb+Aspect marker

0_रहा_है{जाना^रखा~जाना~{@ing}[-]}

जा{0_रहा_है}

WSD_root_mng,rule_name::go47

जा रहा हूँ

(2) Ram eats food. => raama khaanaa khaataa hai.

Root verb + Aspect + GNP + Tense + GNP

khaa + t + aa + hai

2 Previous Works

Tense, aspect and modality have been studied extensively by linguists, both separately and as part of the study of temporal information encoded in natural languages. One of the most well known works in the first category is by Bybee, et al. Their book discusses how tense, aspect and modality have evolved in different language. Tense, aspect and modality in Indian languages have also been studied from a linguistic point of view. The book *Tense and Aspect in Indian Languages* edited by Lakshmi Bai and Mukherji contains a collection of a few such papers.

Syntax and semantics of temporal adverbials and TAM information had been widely discussed in the literature (Smith 2007, Demirdache, et al. 2007). Stowell (2007) presents an approach to tense construal that assumes that Times are arguments of TP, and proposes an account of how Times are represented in the syntax without there being lexical items that refer to them. It is argued that VP material is copied into positions that are construed as temporal argument positions. The 'copy' approach to Reference time and Speech time is argued to account for the influences of VP and DP features on temporal ordering. The 'copy' approach also makes available a new analysis of the relationship between Event time (E) and Reference time (R). That relationship has most often been characterized as either a finite tense-ordering relation or an aspectual relation. It is argued here that when R and E are not co-referential the relation between them is one of temporal partitivity. Vieu, et al. discussed that the compositionality of temporal locating adverbial modification in French. Vijayanarayana (1993) discussed the location of time adverbial in Telugu in the context of Indian Languages.

TAM has not been widely discussed for Machine Translation. We have got some relevant work on it. One of them, Anil Singh, et. al. (2007) has discussed on Disambiguating Tense, Aspect and Modality Markers for Correcting Machine Translation Errors. They discussed that, all languages mark tense, aspect and modality (TAM) in some way, but the markers don't have a one-to-one mapping across languages. Many errors in machine translation (MT) are due to wrong translation of TAM markers. Reducing them can improve the performance of an MT system. They used about 9000 sentence pairs from an English-Hindi parallel corpus. These were manually annotated with TAM markers and their mappings. Based on this corpus, they identify the factors responsible for ambiguity in translation. They present the results for learning TAM marker translation using CRF.

This work is different for Machine Translation. But these papers help a lot to understand the MT problem and resolving TAM issues in English-Hindi MT.

3. Basic Difference/Issues between English-Hindi TAM

3.1. Aspect in English and Hindi

Aspect shows the habit, continuity and perfection of the work. There are three main aspects in English and Hindi.

1. Habitual Aspect (-taa_hai / (-s/-es))
2. Continuous or progressive Aspect ((rahaa_hai /(-ing))
3. Perfective Aspect ((-yaa/-aa (-ed))

Habitual aspect shows habit and continuity in work and also shows the generalization and universality in the statement or utterance. Example-

(3) I go to the library every week. => maiN hara haphte pustakaalaya jaataa huN.

In translation, the use of Habitual aspect markers in English and Hindi some times, they are similar and sometimes different. Examples-

(4) Look, how the boll **turns** into red. => dekho, kaise genda laala ranga me badala jaataa hai

(5) The purse **contains** a gold ring and a few dollars. => parsa meN ek sone ki anguthi aur kucha daalarsa haiN

(6) The university **reopens** on 16th October. => Vishwavidyalay solaha akTubara ko khulegaa.

(7) I **hate** such people. => mujhe aise logoN se ghrinaa hai.

(8) I **beg** your pardon. => mujhe kshamaa kareN

Thus, we can observe here that when these habitual aspect markers in English, are being translated into Hindi, so their meaning are changing.

Continuous Aspect shows that the work is going on. For Example,

(9) It is raining. => baarisha ho rahi hai.

Sometimes, continuous aspect markers are used to present future tense in English and Hindi both. Specially with time adverbials showing future tense.

(10) I am going to Varanasi tomorrow. => maiN varanasi jaa rahaa huN/ jaungaa.

(11) I am marrying this summer. => mai isa garmii meN shaadii kara rahaa huN/ karungaa.

Perfective Aspect shows the completion of the work. In Hindi, perfective aspect shows a definite state. In English, -ed verb form also shows past habitual action. which is not found in Hindi. In Hindi, we have to use special suffix -taa_ thaa for showing habitual past. For example,

(12) I liv**ed (used to live)** in Calcutta those days.

=> maiN una dinoN kalakatte meN rahataa **thaa/ rahaa karataa thaa.**

3.2. Tense in English and Hindi

The grammatical forms known as tenses establish the time talked about in a sentence, in conjunction with other temporal expressions. Time is highly controversial on philosophical point of view. Time is related with history. Tense is one of several linguistic expressions that contribute to temporal location. I'll discuss tense from an information-based point of view, focusing on how interpretation depends on sentence. Tense expresses a relation between Speech Time and Reference Time; the relation between Situation Time and Reference Time is under-specified for most tenses. Time is a single unbounded dimension, analogous to space though simpler. Like space, time requires an orientation point or landmark for location. The speaker is the canonical center of linguistic communication: the basic temporal orientation point in language is the speaker's time, Speech Time

(now). The grammatical domain of tense is the clause. I take 'tense' to be a morpheme, either an inflection or auxiliary, that appears in the main verb phrase of a sentence and has a temporal meaning. In English and many other languages, tense is obligatory in main clauses. Each tense assigns a temporal location to the situation talked about in its clause (Smith 2007). The tense specifies all the times like this: There are three major divisions of the time axis.

1. Before the time of utterance. PAST
2. At the time of utterance. PRESENT
3. After the time of utterance. FUTURE

Speech Time (SpT) is the center of the system and is the basic default orientation point for temporal expressions. Reference Time (RT) represents the temporal perspective of a sentence; it is simultaneous with, before or after orientation time. (Reichenbach's Event Time) Situation Time (SitT) is the time of occurrence of a situation; it is simultaneous with, before or after RT.

3.3. Mood in English and Hindi

According to English grammarians, verbs used some style or way to represent any work, that is called mood. There are three moods in English: Indicative, Imperative and Subjunctive. But the concept of mood is quite different in Hindu. Because, In English can, may, might, shall, should, ought, would, must are comes under modal auxiliaries. While in Hindi, saka, cuka, paa, caahiye, are comes under modal verbs. Mood suffixes or markers are used to show the specific mood. For Examples-

(13) I cannot sleep on the ground.
=> mujhase jamina para nahiN **soyaa jaataa**.
=> mujhase jamina para nahiN **so sakataa**.

(14) Reply to the letter.
=> ciTThi kaa javaaba de do (immediately)
=> ciTThi kaa javaaba de denaa (after sometime, Non-honorific)
=> ciTThi kaa javaaba de dijiyegaa (after sometime, Honorific)

4. TAM Divergence

I. Active-Passive Constructions

A. should_not_be_en → 0_jaanaa_caahiye-ko-nahi (suggestion) yaa_(jaanaa)_caahiye-(ko)-nahi. (0_jaanaa_caahiye-ko-nahi Here, 0 is free. jaanaa_caahiye is Verb phrase, -ko- is Vibhakti marker and -nahi is negation.)

(15) This truth should not be forgotten.

=> yaha saca nahiN bhulaayaa jaanaa caahiye

(16) A woman should not be forced to choose between her job and her family.

→ kisi orata ko usakii naukarii aura usake parivaara ke bica cunaava karne ke liye majbura nahiN karanaa caahiye.

This TAM has passive voice and this follows with most of the cases except for the cases where there is a human subject which makes the translation in Hindi. In active voice while with the non human this TAM's translation is affected differently.

B. were_not_to_be_en → yaa_jaanaa_thaa-0-nahi

(17) You were not to be found.

→ tumhe nahiN paayaa jaanaa thaa.

→tum nahiN mila rahe the (Passive to active)

C. would_have_to_be_en →naa_hogaa-0-0

(18) I think it would have to be changed substantially.

→ mai socataa hun ise kaaphii hada taka badalanaa hogaa/padegaa.

ii. Would and Could Constructions

A. would_have_to_0 => naa_hogaa-ko-0

(19) I knew we would have to wait and see.

→ mai jaanataa thaa hame intajaara karanaa hogaa aura dekhanaa hogaa.

iii. Modality based Divergence

A. were_to_0 => ne_vaalaa_thaa-0-0

(20) If Christians were to start working with prisoners in significant numbers, it might be the beginning of new era.

→ yadii krishciiyana adhika sankhyaa men kaidiyon ke saatha kaama karanaa shuru karen vaale the to yaha eka naye yuga kii shuruaata ho sakatii thii. (kareN possesses subjunctive mood)

B. will_have_been_en → yaa_huaa_hogaa-0-0

(21) The decision will have been made for me.

=> mere liye nirnaya liyaa gayaa hogaa.

C. will_have_en → 0_liyaa_hogaa-0-0

(22) We will have seen everything.

→ hama saba kucha dekha liye honge.

(23) Then I will have done a really great job. (with done,made,lost,spent, 0-yaa_hogaa-0-0)

→ taba main vaastava mem bahuta acchaa kaama kara liyaa hungaa.

D. will_need_to_0 → naa_kii_jarurata_hogi-0-0

(24) I will need to start my investigation after the funeral tomorrow.

→ mujhe meraa khoja kala antyeshtii ke baada shuru karane kii jarurata hogii.

E. will_need_to_0 → naa_padegaa-0-0

(25) Some schools will need to buy new editions.

→ kucha skulon ko nayaa prakaashana khariidanaa padegaa.

F. may_have_en → yaa_hogaa-ne-0

(26) You may have seen the video.

→ tumane vidio dekhaa hogaa.

G. may_not_0 → 0_sakataa-0-nahi

(27) You may not use it all.

→ shayada tuma ise bilkula hii istemaala naa karo.

H. may_not_be_en → yA_jA_sakawA_hE-0-nahIM

(28) But one question may not be answered.

→ lekina ho sakataa hai eka prashna kaa uttara nahin diyaa jaa sake.

iv. Hypothetical (Irrealis Mood)

A. without_ing → yaa_binaa-0-0

(29) You wouldn't buy a boat without looking at it.

→ tuma naava binaa dekhe nahiin khariidoge.(Imperative)/aisaa nahiin hai ki tuma naava binaa dekhe kharida loge.

B. would_never_0 → gaa-0-kabhi_nahi

(30) You would never kill me.

→ tuma mujhe kabhii nahiin maaroge.

C. would_not_be_en → yaa_jaayegaa-0-nahi

(31) Again, I would not be surprised to see some triple-digit heat.

→ phira se, mai koi tiivra garmii dekha se aashcaryacakita nahiin houngaa.

D. would_not_be_ing → 0_rahaa_hogaa-0-nahi

(32) She would not be coming with me.

→ vo mere saatha nahiin aayegii.

v. Perfect Continuous

In Hindi we don't have equivalents for the cases with both perfect and continuous aspects. There's no word to word semantical mapping of perfect continuous in Hindi as can be found in English.

A. should_not_have_been_ing → taa_rahanaa_caahiye_thaa-ko-nahi : naa_caahiye_thaa-ko-nahi

(33) A 7-year-old should not have been flying the plane.

→ eka saata saala ke bacce ko havaai jahaaja nahiin udaanaa caahiye thaa.

B. could_have_been_ing => taa_ho-0 ho_sakataa_hai.. suggestion= taa rahaa hogaa/0_rahaa_hogaa

(34) I have no idea what they could have been thinking.

→ mujhe koi andaajaa nahiin hai kii ve kyaa soca rahe honge.

C. should_have_been_ing → taa_rahanaa_caahiye_thaa-ko-0

(35) You should have been paying attention to where we were going.

→ tumhe dhyaana dete rahanaa caahiye thaa ki hama kahaa jaa rahe the.

(36) He should have been watching the hills.

→ use pahaadiyaan dekhatii rahanii caahiye thii/use pahaadiyaan dekhanii caahiye thii.

D. will_not_be_ing → 0_rahaa_hogaa-0-nahi

(37) They will not be going free at least for another eight days.

→ ve kama se kama agale aatha dina aajaada nahiin ghumenge.

(38) So next month he will not be taking part in the N.C.A.A. tournament.

→ isliye vaha agale mahiine N C A A khela pratiyogitaa men hissaa nahiin legaa.

(39) I will not be coming back.

→ mai vaapasa nahiin aa rahaa hungaa. [Sugestion: aaungaa]

E. have_not_been_ing → taa_rahaa_hai-0-nahi (rahaa_hai-0-nahi)

(40) You have not been talking.

→ tuma baata nahiin kara rahe ho.

(41) you have not been telling the truth.

→ tuma saca nahiin bola rahe ho.

F. may_have_been_ing taa_rahaa_ho-0-ho_sakataa_hai Here, ho_sakataa_hai can be add in this Hindi TAM.

(41) He may have been watching her house from the darkness of the trees.

→ ho sakataa hai vaha uskaa ghara pedon ke andhere se dekhata rahaa ho.

G. must_be_ing → taa_rahaa_hogaa-0-0 0_rahaa-hogaa-0-0 (Suggestion)

(42) He must be thinking how pathetic I am.

→ vaha socataa hogaa ki mai kitanaa dayaniya/diina huN!

vi. Case based Divergences

The following cases are of those TAMs where their Hindi translation changes either due to the main verb or the subject.

A. was_not_to_0 → ne_vaalaa_thaa-0-nahii : ne_kaa/ke liye_thaa-0-nahii [to be solved in WSD]

(43) She was not to blame for the death of her husband.

→ vaha apane pati kii mrityu ke liye jimmedaara nahiin thii.

(44) The goodwill was not to last.

→ vaha sunaama (jyaadaa dinon taka) chalane vaalaa nahiin thaa.

(45) The intention definitely was not to create fear in our patients.

→ iraadaa nishcaya hii hamaare rogiyon men bhaya paidaa karne kaa nahiin thaa.

(46) The only thing I could tell them was not to go skiing.

→ main unhen basa skinga para nahiin jaane ke liye kaha sakataa thaa.

B. were_unable_to_0 → 0_paataa_thaa-0-nahii

(47) They were looking to leave but were unable to get out.

→ ve jaane ke liye soca rahe the lekina baahara nahiin nikala paa rahe the.

(48) Police were unable to locate any of Neil's relatives.

→ pulisa niia ke kisii bhii sambandhii ko khojane meN asamartha thii.

C. will_not_be_en → gaa-0-nahii

(49) Pam will not be allowed inside.

→ paima ko andara (aane kii) anumatii nahiin hogii[Suggestion. dii jaayegii].

(50) This information will not be understood by the consumer.

→ yaha sucanaa upabhoktaa nahiin samajha paayenge.

(Passive to Active but not all the cases.)

D. will_not_have_en → 0_liyaa_hogaa-0-nahii (with achieved, taken,eat)

0-kara_paaungaa-0-nahii (only with first person)

(51) I feel I will not have completed my job by tomorrow.

→ mai mahasusa karataa hu kii main apanaa kaama kala taka nahiin khatama kara paaunga.

(52) My son will not have died in vain.

→ meraa betaa vyartha men nahiin maraa_hogaa.

E. have_to_0 → naa_hai-ko-0

(53) Sometimes you just have to make a better mousetrap.

→ kabhii kabhii tumhen basa eka behatara cuhedaanii banaanii hotii hai.

All the cases have different translations; these cases have to be solved in WSD and those for which we cannot give WSD have to be fed to the machine for learning.

(54) You have to put creativity in the workshops.

→ tumhe kaaryashaalaaon men srijanatamaktaa daalanii hai.

(55) I Have to Go!

→ mujhe jaanaa hai.

F. have_to_be_en → naa_hii_hai-0-0

(56) I have to be prepared for camp.

→ mujhe kaimpa ke liye taiyaara honaa hai.

(57) And these things have to be taken seriously.

→ aura ina cijon ko gambhiirataa se lenaa hai.

(58) Moreover, devices have to be replaced while in operation.

→ isake alaavaa, yantron ko caalu avasthaa men hii badalanaa hotaa hai.

vii. One to many or Many to one mapping from English to Hindi Translation

A. had_to_0 → naa_padaa-ko-0

(59) The child had to make a guess before the red screen appeared.

→ laala skriina ke aane se pahale baccon ko eka anumaana lagaanaa hotaa thaa.

B. can_not_help_ing → raha_sakataa-ko-yaa_bina_nahii

(60) He can not help thinking for a moment that she is right.

→ vaha ek kshaNa ke liye soce binaa nahiin raha sakaa ki vaha sahii hai.

C. could_not_have_been_ing→ taa_ho-0-ho_sakataa_hai_nahii

(suggestion= rahaa_ho-0-ho_sakataa_hai_nahii) (rare use only 15)

(61) The car could not have been going very fast.

→ gaadii bahuta teja nahiin cala rahii hogii.

D. could_not_help_ing → raha_sakaa-ko-yaa_binaa+nahii

(62) But he could not help worrying about Little Yang.

→ lekina vaha chote yanga ke baare men soce binaa nahiin raha sakaa.

viii. Others

A. can_never_have_en → 0_sakataa-0-kabhii_nahiin

(63) He can never have seen the animal.

→ vaha jaanavara kabhii nahii dekhaa hogaa.

This sentence has a sense of impossibility that it is impossible for the person to have seen the animal which cannot be covered by any mapping in Hindi.

B. can_not_have_en → yaa_hogaa-0-nahiin

(64) These boys can not have seen the memorable image of Cathy.

→ ye ladake kaithii kii yaadagaara tasviira nahii dekha sake honge.

C. did_have_to_0 → naa_padaa-ko-0

(65) I did have to stop and think.

→ mujhe ruka kara socanaa (hii) padaa.

This case involves an emphatic sense which is captured by *hii* in Hindi which however is not extractable from the syntactic structure of the sentence.

5. Conclusion

This paper is an attempt to solve a large problem of divergence in English-Hindi TAM mapping. We have categorized these TAM issues, and have tried to solve them linguistically. There are some TAMs where we need to apply WSD rule. In some cases, some senses are rare occurrences so we have left those cases for now. There is no word to word semantic mapping of perfect continuous in Hindi like in English. Some TAMs have passive voice and follow with most of the cases except for the cases where there is a human subject which makes the translation in Hindi difficult. In active voice, with the non-human, these TAM's translation is determined differently. The Irrealis mood in English cannot be captured in Hindi in same mood. The same mood translation requires to have extra phrase. In Hindi, we do not have equivalents for the cases with both perfect and continuous aspects. These cases are of those TAMs where their Hindi translation changes either due to the main verb or the subject. We have not concluded this paper at this stage. This is only a categorization and a first step to resolve the divergence issues.

The solutions of these TAMs have been uploaded in the Anusaaraka system with some WSD rules. Now, the result is better than before and TAM related problems have been resolved while translation (from English to Hindi), still some more WSD rules require to make a better translation system.

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Neha Maurya, M.A., Ph.D. Scholar(Thesis Submitted)
neha.mourya08@gmail.com

Shubhra Apurve, M.A., Ph.D. Scholar
shubhraapurve@gmail.com

Manish Singh, M.A., Ph.D. Scholar
maneeshhsingh100@gmail.com

Madhavi, M.A., Ph.D. Scholar(Thesis Submitted)
madhavimanya.kush@gmail.com

Saurabh Srivastav, M.A., Ph.D.. Scholar
saurabh0780@gmail.com

Ruchi Singh, M.A., Ph.D. Scholar
ruchisingh.linguistics@gmail.com

Department of Linguistics
Banaras Hindu University
Varanasi 221005
Uttar Pradesh
India