Chapter-7
CONCLUSION

In Old English *of* is an unstressed form of ‘æf’ (preposition, adverb) with the meaning of ‘away’ and ‘away from’. Primary sense in Old English was still ‘away’, but shifted in Modern English as the substitute for the genitive case, and mostly grammaticised.

*Of* is the most grammaticised of all prepositions. Apart from its basic locative meaning ‘away’ ‘away from’, it has concepts like geographic origin, belonging, selection from a set, and many others.

*Of* can be part of complement in the structure of NP, VP, AdjP, AdvP etc., and it also functions as a modifier, stranded etc. Subject-determiner genitives exhibit extensive relation with *of*. Furthermore *of* syntactically comes with many combinations: nouns, phrasal verbs, complex prepositions, adjectives, etc. *Of*, semantically, is also found in time, place adverbs, etc.

Nouns do not take non-genitive NPs as complement. Subordinate NPs are related to the head noun by genitive case by prepositions, and *of* is the default preposition used for this function. Like nouns, adjectives do not take NPs as post-head complement. Subordinate NPs are related to the head adjective by means of a preposition, and *of* can be the default preposition in this construction.

Verbs and prepositions do take NP complements, so prepositions in general, and *of* in particular, play a smaller role in their complementation. There are a number of verbs and prepositions which do select *of* complements.

Ex. She approves *of* the plan.

Like nouns, adjectives do not take NPs as post-head complement. Subordinate NPs are related to the head adjective by means of a preposition, and *of* can be the default preposition in this construction.
Ex.. I feel ashamed of myself.

There are a few cases where of is not selected by the head and thus makes an independent contribution to the meaning. In the following examples of phrase is

Modifier in NP structure:

a matter of no importance

It can be seen from the above details that the word of has to be studied thoroughly to get proper output of a machine translation system.

Translation process:

Translating this hyper word of into Telugu is a challenging task for machine translation system. A translation task has two phases. First phase is to identify the structure and the meaning of the source constructions involving of, and the second phase is to find appropriate equivalent structure and meaning in the target language.

To get proper meaning of a word we have to consider the polysemy and homonymy issues. These issues are in the form of proper nouns, adjectives vs adverbs, adjectives vs nouns, etc. Apart from these issues, finding meaning for idioms, metaphors, satires or ironies, etc. is more difficult for a machine. A meaning of a word or phrase depends on the context. In a direct interaction one can get help from various sources like intonation, context, body language etc. but when it comes in an indirect mode of interaction this gets worse.

Phrasal words/meanings are most common in any natural language. They have their own identity. It is very difficult to analyze these units in a straightforward way. There is a need to take them for a separate study. While analyzing a sentence first of all it is better to extract the phrases (phrasal nouns, phrasal verbs, phrasal prepositions etc.) and then analyze the sentence accordingly.
**Distribution of *of*:** *Of* is found in the following structures:

- Phrasal nouns, non-inflected forms of genitives, fixed prepositional verbs (V + Prep (fixed)), mobile prepositional verb (V + Prep (mobile)), those which select a PP complement containing a specified preposition together with its own complement (fossilized), verbal idioms, fixed particle [V+Prep], mobile particle [V+X+Prep], adj+of+Nx, adv+of+Nx, complex, compound, stranded, at the beginning of the sentence, adjunct, idiomatic, functioning as other POS, and some typical constructions.

The above places should be studied while identifying the original meaning of a word in a source language.

After identifying meaning of the source language, finding equivalents for them is another challenging issue. Some of the issues are:

**Explicit lexical/functional equivalent in the target language:**

Ex.1. Did something [come of all those job applications]?

anni ā udyōga arjīla nuñci āmainā vaccindā?

(To identify these kinds of phrases, the following kind of rules would be helpful. ‘come+of+Nx’ is a phrase where the word *of* takes the equivalent ‘nuñci’)

**No lexical equivalent required in target language:**

Ex.2.

I reserved them by phone yesterday *in the name of Kittu.*

…kitṭū pērupai phōnlō rjarv cēsānu.

Ex.3.

Much blood has been spilled in the name of religion.

tataṁ pērupai cālā raktarṇ cimmindī.

**Usage of inflections in the target language:**
Ex. He sent me some flowers by way of an apology.
ataḍu kṣamāpanalaṇa ku gurtuga puvulu pampiṅcāḍu.

Some issues in the translation of the structure N+of+N:

While translating the nouns from source language (here English) into the target language (here Telugu) the following issues have to be considered:

1. For some nouns target language may have local equivalent,
2. Sometimes transliteration is needed,
3. Some typical situations are there where the word order remains the same in the target language,
4. Sense difference may be there in different places (countries, states) and languages (Hini, Telugu), etc

When we tried to enumerate the functional equivalents for the English word of in Telugu, the following (21+1) functional equivalents are found:
yokka, pu, koddi/lādi, lō, lōki, ḍu, lāṇṭi/lāgā, arṛṭē, kala/gala, nu, ādi, tō, (t)ū, gā, guriṅci/gūrci, ku, nuṅci/nuṇḍi, kaṇṭē, niki/naku, ē, valla and plural oblique la.

Some specific observations:

1. No lexical equivalent needed for English word of for noun+of+noun structure (but there are some exception seen) in Telugu.
2. The oblique stem of the noun fulfills the function of genitive in Telugu. But some nouns have no explicit oblique forms, ceṭṭu, medaḍu, guḍḍu etc.
3. Sometimes one of the homonyms takes oblique form according to their meaning, pannu – ‘tooth’ and ‘tax’.
4. Within a synonym set, some words take oblique form and others do not, bāluḍu – bāluḍi, abbāyi – abbāyi.
5. Some times the syntax of the phrase shows the influence on the oblique form, pustaka puṭa, pustakaṃ mundu puṭa,
6. Proper nouns do not take oblique form except ‘ḍu’ ending, as in rāmuḍi, krṣṇuḍi.
7. We may write rule that ‘lu’ ending nouns take oblique form ‘la’, but it fails in the example like manumarālu (granddaughter), ‘la’ is the oblique form of this noun. So while framing rules this point should be keep in mind.

8. Other cases (verb + of + noun) like instrumental, ablative etc needed an explicit equivalent for the word of.
   
   Ex. Died of something,
       Made of something.

9. In some cases change of syntax is not necessary: ex. a kilo of mangos – kilō māmiṇḍi pāḷḷu. (where a quantifier occurs in pre nominal positions)

10. Usage: there is a possibility of substitution/interchangeability of words:
    
    Ex. Do you know of/about a good doctor?
        heard of/about someone/something

11. Dialectal influence on equivalents/translation:
    
    Ex. I’m sick of his excuses – atani sākulaṭō/aṟṟē visugū cendānu (causal/quotative marker)

12. The functional equivalent for of can be causative, instrumental, adverbial particle, quotative, etc.

13. Phrasal verbs are usually used informally in everyday speech as opposed to the more formal Latinate verbs, such as ‘to get together’ rather than ‘to congregate’, ‘to put off’ rather than ‘to postpone’, or ‘to get out’ rather than ‘to exit’. Here we have an issue related to the translation: whether informal words of source language can be translated by using formal words in the target language. Because of this issue a translator should see whether the source text allows giving formal equivalents in target language.

   All the above mentioned issues should be solved to get effective machine translation. This information should be given to the computer using a proper methodology. Some of the popular methods are Rule Based Method, Example/Parallel Corpus Based method, etc. Apart from these, dictionary can also be used to solve some of the issues related to the phrasal entries. The result of the dictionary method is given below.
Dictionary Based Method:

Listing all the phrases into the dictionary is not possible. The following results confirms that point.

Here, some sentences which contain phrasal nouns, idioms, phrasal verbs etc. are taken and mapped with the dictionary entries. Following are the details.

a. Phrasal Noun analysis
   - Number of input sentences: 65.
   - Input Sentences matched with the data: 43.
   - Percentage of match: 66.1%

b. Idioms & phrases
   - Number of input sentences: 351.
   - Input sentences matched with the data: 112.
   - Percentage of match: 31.9%

c. Others
   - Number of input sentences: 37.
   - Input sentences matched with the data: 14.
   - Percentage of match: 37.8%

d. Phrasal verbs
   - Number of input sentences: 77.
   - Input sentences matched with the data: 0.
   - Percentage of match: 0%

Some of the possible problems with the dictionary entries are given below:

1. Number: (singular-plural)
2. Extra information in data base (explanation etc)
3. Spelling mistakes: (human error)
4. Short form of usage (house-house of commons)
5. Capitalization of the entry (House-house)
6. No entry in the data base.
7. Singular form in the dictionary (arm- arms of sth).
8. Capital forms: there may be a conflict between the input and the data files with capitalization of the initials.
10. Data may have extra information i.e. Other than the main entry.
11. Complex structure of the phrasal nouns (n+of+n+n+n or n+of+adj+n, etc)
    Ex. index of leading economic indicators.
12. Clipping usage: the Fall (of Man).

Some issues with phrasal verbs in the above method:

There are three major problems to identify the phrasal verb unit.

2. The complement of the phrasal verb. The complement of the phrasal verb can be anything like a noun, noun phrase, or clause etc. Identifying the phrasal verb’s complement and giving the proper equivalent for that unit is a challenging task for machine translation because it is not practicable to put all the variables in a dictionary.

For example in the following examples something (sth) can be any thing:

admit of sth:
    admit of modification. - single word and singular form
    admit of several interpretations - adjectival and plural form

allow of sth
    allows of no exceptions - negative and plural form
    allows of only one interpretation - determiner and singular noun
become of sth
   (Whatever) became of that parcel (you sent?) - determiner and singualr

dream of/about sth
   (I) dream of one day working for myself and not having a boss. - a clause

3. And the third one is the homonymous prepositions:
   get out of sth (avoid)
   get out of sth (stop)
   get sth out of sth (enjoy)
   get sth out of sb (persuade) etc

Rule Base Method:
   Rule Base Method may be needed by both the phases of translation. (identifying
   the meaning unit in the source language and giving equivalent in the target language).

   As we have mentioned earlier, the word of found in around 35 syntactic contexts. These
   structures include complements, idioms, stranded cases etc. Extracting these
   structures is a challenging task for a machine translation.

   In computer programming, Regular Expressions are an extremely versatile tool
   for the extraction of lexical items and syntactic patterns from electronically stored text.
   But there are certain limitations are found here:

   For example, by allowing up to three elements to occur before the nominal
   element, the precision of the search result of rule based method will be lowered. This is
   due to the fact that instances will be retrieved where a syntactic boundary is located
   between the first prepositional element and the noun. One example of this, which features
   the PNP-construction ‘in need of’, is shown in the example below.

   Ex.
The beginning of this trend, in which the fundamental need of parents is to be happy in parenthood, can be seen in two ways.

After pattern extraction, ambiguity, polysemy issues should be resolved afterwards we need to give the proper functional equivalents to these patterns. As we discussed above lot of issues have to be considered for this process.

Identifying the oblique forms of nouns is very much important in this context of identifying the functional equivalent for the English word *of*, because most of the times, in Modern Telugu, oblique form fulfills the function of genitive etc.

I tried to limit the rule on the basis of attributive features. According to my data, only a limited number of structures take the functional equivalent for the word *of*. Instead of trying to generalize the structures, it is better to give direct structures and get the output according to the requirement. For some patterns, where it is not possible to write rules, other methods like example/parallel corpora method can be used.

Example/Parallel corpus based method:

Giving the possible equivalents in the target language in the form of rules is not fully possible. We need some supportive methods to solve this kind of problem. The possible method would be Example based or Parallel Corpora method.

In the Example/Parallel corpus method we take full sentences with their translation and list in a file. When input sentence has a match with these sentences it retrieves that sentence’s translation as an output. We can put all the sentences in this file and extract this wherever needed. The great limitation is the processing speed of the computer. This method takes a lot of time to search the corpus file, mostly because of the size of the file. This is not at all acceptable for normal usage of a system. But this system can work efficiently if we get high speech computer. Another limitation is that lacking of discourse level parallel corpora. To solve this problem we may need some rules. Therefore it is a kind of cyclic process.
Concluding remarks:

Though the hyper word *of* is the most frequent word in English, only a limited number of contexts in Telugu needs explicit equivalents for it, like in idioms, in phrases etc. All phrasal nouns containing *of* can be listed in a dictionary because these units are constant in nature, and do not yield for analysis of the structure. Listing the idiomatic expressions and phrases is also important, because writing rules for these structures is not recommended. We can maintain a database for these units. For other structures we can use Rule Based Method. Even though this method has limitations it works fast, in term of computing. Identifying nouns which take oblique forms is very important to find the correct functional equivalent for the word *of*. Because, some nouns in Telugu do not take oblique forms and some do, sometimes even according to the context. Example/parallel corpus method is more effective and natural. But the big limitation is that this method takes longer time to retrieve output. If we get faster computers then this method works very well.

It is not the shape or size of the word, but it is the function of the word which matters. Even a smallest unit of a language needs a whole range of study in translation particularly in machine translation. Here whole range means 100% not less than that.