i.        search word at index i+1, S[i+1] in Dictionary and read the POS of the word

ii.        if(S[i+1].POS=RB‖ S[i+1].POS=IN ‖S[i+1].POS=WRB) i.e if the parts of speech of word at S[i+1] is adverb, preposition

        Split S into two arrays, S1 [0…i] and S2 [i+1…len-1]

iii.        SBAR_ Shift (S1, S2); i.e. The clauses (S1, S2) are shifted so that the dependent clause is followed by independent clause

iv.        SC_ Move (S2); i.e. The subordinate conjunction is shifted so that it comes at the end position of the dependent clause

b)    if(S[i].Contains(','))

i)        search word at index 0,S[0] in Dictionary and read the POS of the word

ii)        if(S[0].POS=RB‖ S[0].POS=IN ‖S[0].POS=WRB) i.e. the parts of speech of word, S[0] is adverb(RB) or preposition(IN)

        Split S into two arrays, S1 [0...i] and S2 [i+1...len-1]

iii)        SBAR_ Shift (S1, S2); i.e. the clauses (S1,S2) are shifted so that the dependent clause is followed by independent clause

iv)        SC_ Move(S1); i.e. the subordinate conjunction is shifted so that it comes at the end position of the dependent clause

Step 4: Chunk (S1); Chunk (S2);

Step 5: Reorder (S1); Reorder (S2);

Step 6: Translate (S1); Translate (S2);

## 8. RESULTS AND DISCUSSION

The algorithm was implemented to translate compound and complex sentences in English to Telugu machine translation system. . To evaluate the system performance in translating discourses formed using connectives a test suite of around 400 sentences was developed.  The MT system was tested on the test suites and the outputs generated by the system were compared with expected outputs, there by score was given to the outputs generated based on adequacy and fluency measures.

Table 4 gives the details of datasets created for evaluation of simple compound and complex sentences. The exact translations of the sentences were prepared with the help of linguistic experts of SL and TL. The outputs generated by the system were compared with the exact translations and scoring was done on the degree of adequacy and fluency, Table 3. The accuracy percentage of scores obtained by MT System are given in Table 5 and Figure 6

**Table 3. Scoring based on adequacy and fluency measures**

| Score | Description |
|---|---|
| 3 | The sentence is perfectly clear and intelligible |
| 2 | The sentence is generally clear and intelligible. Despite some inaccuracies, one can understand immediately what it means. |
| 1 | The general idea is intelligible only after considerable study. The sentence contains grammatical errors &/or poor word choice. |
| 0 | The sentence is unintelligible. |

**Table 4. Accuracy of test suite to handle discourses formed by connectives**

| Sentence types | Count of sentences tested | Accuracy percentage |
|---|---|---|
| Simple | 150 | 90% |
| Compound | 100 | 82% |
| Complex | 150 | 78% |

**Table 5. Scores obtained by MT System**

| Score | Simple (%) | Compound (%) | Complex (%) |
|---|---|---|---|
| score 3 | 90 | 50 | 10 |
| score 2 | 8 | 30 | 50 |
| score 1 | 2 | 10 | 30 |
| score 0 | 0 | 10 | 10 |

**Figure 6: Scores obtained by MT system for different Sentence types**
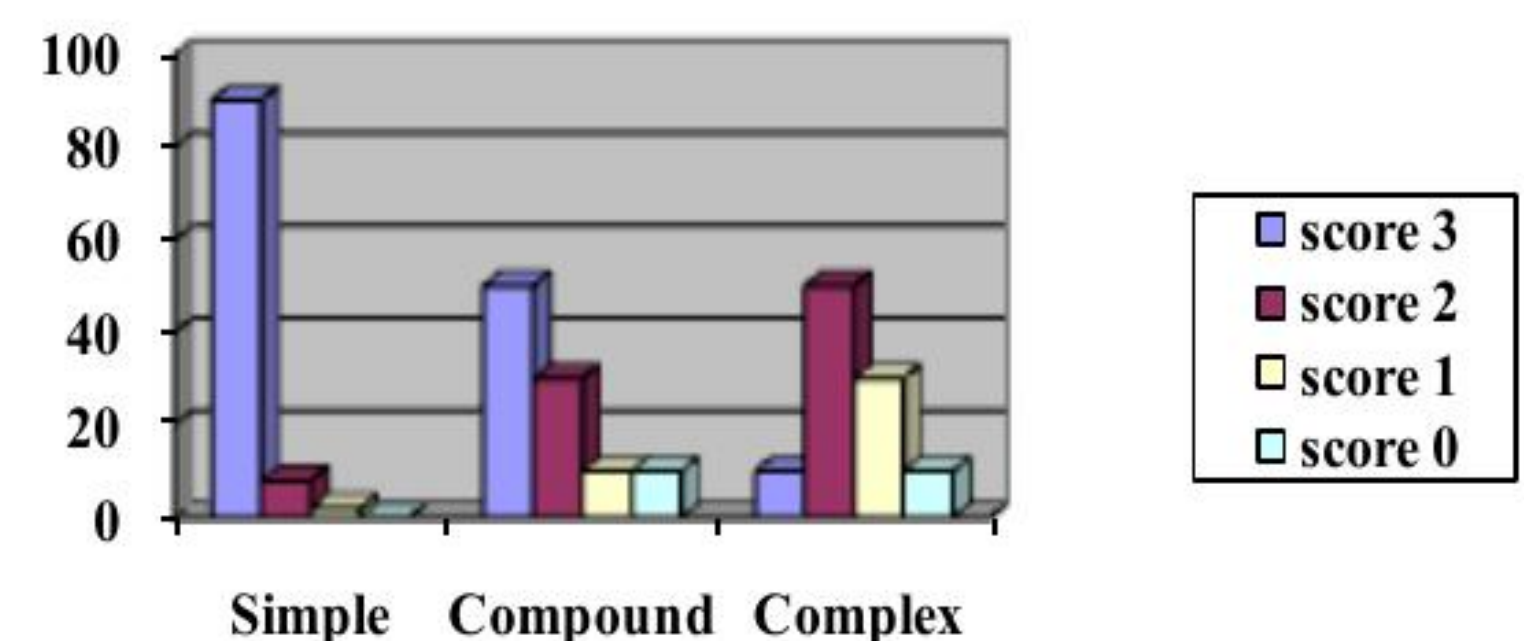


## 9. COMPARISON WITH GOOGLE TRANSLATOR

The machine translation system was tested on test suites containing simple compound and complex sentences. The extract of test suite is given in Table 6.  Since this research was done for the first time and no exisiting software deals translation of discourses with connectives for the language pairs English and Telugu, Google translator which is an Example based translator is taken for comparing the accuracy of results obtained by MT system. The results were compared with results obtained by Google translator and found to more accurate.

## 10. REFERENCES

[1]  Hauenschild C. 1988. Discourse structure - some implications for Machine Translation, *In proceedings. of Conf. on New Directions in Machine Translation*, Budapest, August 18-19 Dodrecht-Holland