

Comparative assessment of Google and Targoman translation machines in terms of adverb translation from English to Persian

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Abstract

Online machine translators provide users with translator models based on their previously incorporated corpus. Different works have been done in this field yet machines have some deficiencies needing to improve. The goal of this paper was to evaluate and compare two free translation machines which are Google (<https://translate.google.com/>) and Targoman (<https://targoman.ir/>) in terms of translating English adverbs into Persian and suggest the more qualified machine. It was done according to Doug Arnold's quality assessment method which

In today's world, most human translators do not do their work individually. The invention of Translation machines brought a massive alteration to the world of languages and communication. Blending machine translation's speed and accuracy with human translators' skill for the process of post-editing and pre-editing, the right balance, which is quality and efficiency at a good price and a good amount of time, will be acquired.

Four types of machine translation exist: Statistical Machine Translation (SMT), Rule based Machine Translation (RBMT), Hybrid Machine Translation, and Neural Machine Translation. The focus of this paper was mainly on two neural machine translations.

Using translation machines, abbreviated here as "TM", as an aid for human sources of translating brings about convenience. To mention in brief, translating with the help of a TM has advantages:

- A) enhances the time of process. Human translations are exact and acute but when a TM is used, time is saved as a huge number of words can be translated in a second.
- B) Machines are almost free or low-cost aids. They cannot present you a proper result without post and pre-editing but a fast-paced and inexpensive help is appreciated.

considers elements of intelligibility, accuracy, error analysis and test suit. The study contained a test suite of 64 English sentences which were categorized based on the types of adverbs they included. In some cases, Targoman was more similar to the acceptable or reference translation but in total, Google was more accurate in specifying the adverbs and could present more pleasing equivalences. The ultimate correctness percentage of the translated adverbs of Google were 93.75% and this percentage for Targoman was 79.68%.

In some cases, the translated sentence was natural and acceptable in the target language (Intelligible as Arnold says) but having a partial view to the translation of adverb, it was not properly translated (the element of accuracy) or even vice versa. Meanwhile, both machines were helpful in most of the cases alongside their problems.

Keywords: Adverb, Google translate, Machine, Reference, Targoman translate

1. Introduction

C) Machines are stable about their recommended words and translation. A translator may choose alternative equivalences in one text, which is not professional, but machines are more accurate and fixed at this view.

D) Unlike a single person's limited knowledge, machines benefit from huge corpora of data. So, when a translator's knowledge does not suffice, seeking the help of machines' data would be highly beneficial. Besides, the content domain of TMs is thriving day by day.

E) TMs have the ability to translate to and between several languages, in some cases hundreds of languages. A single translator may understand and communicate a limited number of languages.

This paper focused on the function of the considerable universal translation machine "Google translate" (<https://translate.google.com/>) and the so-called best Iranian translation machine "Targoman" (<https://targoman.ir/>). Targoman translation machine was programmed by Natural language processing and machine learning laboratory of Amirkabir University of Technology. It was established under the management of Dr. Shahram Khadivi and with

the support of the Research Institute of Communication and Information Technology (Iran Telecommunication Research Center). This system was used based on open-source tools available in the field of statistical machine translation and development of algorithms and tools required for specialized Persian language processing and was developed as a research project. At this moment; Targoman provides English-Persian translation engine developed by two intelligent processing companies, Targoman and Virafazar Adan.

Google Translate is a multilingual neural machine translation service which translates text, document, image, speech and websites. The idea of Google Translate emerged in Sergey Brinis' mind in 2004 and it was developed in 2006 by Google. At first, Google Translate was a statistical machine translation service. Currently, it is one of the most popular Google services that is constantly evolving and improving. Although the service initially supported a limited number of languages and had many shortcomings, over time, its quality has improved significantly. In other words, Google has slowly upgraded its translator service, both in terms of appearance and functionality, and now "Google Translator" has become one of the most popular services of the company, so that according to statistics, Google Translator has 200 million users monthly.

The use of native translation machine causes more growth and prosperity of the country in the field of technology. Targoman translation machine is one of the native translation machines on which many investments have been made. Further development and better performance of this native translation machine can make the public more inclined to use this native translation tool. Also, doing more research and examining the strengths and weaknesses of this tool will make it more popular.

Apart from all these improvements and benefits for the industry, some lacks could be observed in the tasks of TMs for they can never substitute human's brain and capabilities. Translators may not have the knowledge to help thrive the machines but we have the ability to assess them in terms of translation and recommend people the better and more qualified machine for special fields.

Narrowing down the research, it was done concerning different types of adverbs. The aim of this study was to answer these questions:

- A. How well can Google translator translate different adverbs into Persian?
- B. How well can Targoman translator translate different adverbs into Persian?

2.1.4. Quality assessment of machine translation

- C. Is Targoman underrated in comparison with Google? (Regarding the translation of adverbs and adverbial phrases)

2. Review of literature

In this paper, translations of Google and Targoman were in spotlight. According to different adverbs of various categories in English, the translations with better qualities are going to be assessed.

Most of the papers done in the field of translation machines attempt to investigate issues such as pros and cons of using TMs, Best text types for their function, types of TMs, their history or specific structure-based studies for single languages. Not many papers were dedicated to the comparison of TMs for a specified language, particularly Persian language. Some researches were done on the issues of:

2.1. Works done abroad

2.1.1. Accuracy of translation

It is proved that translation machines are helpful. But on the other hand, a client spends less time on correcting a professional translator's work in comparison to a translation machine. The quality of the translation is usually below average and it requires extensive post-editing.ⁱ Accuracy is a significant quality which every client asks for.

2.1.2 Translation of noun phrase

Due to research which was conducted in Indonesia, based on the accuracy of translation of noun phrases using Google translate, "*out of 25 data of noun phrases, 11 data as accurate translation, 13 data as less accurate translation, and 1 data as inaccurate translation. in percentage, 1,31 as accurate translation, 1.04 as less accurate translation, and 0.04 as inaccurate translation*"ⁱⁱ

2.1.3. Translation of adverbs

Volk, Martin; Graën, Johannes narrowed down a search for binomial adverbs being translated between different languages of English, Swedish and German by Google translate. They understood that common binomial adverbs in English, such as "by and large, first and foremost, over and over," or "nach und nach, nach wie vor" in German, or "helt och hallet, till och med" in Swedish, are quite well but not precisely translated. The most serious issue is that Google Translate occasionally neglects the binomial adverb, which might make the statement complicated in the target language. As in French (Laporte and Voyatzi, 2008) and some other languages, there is presently no repository of multi-word adverbs in English, German, or Swedish.ⁱⁱⁱ

The evaluation of MTs is difficult because measuring translation quality is by no means easy. Arnold (1994, cited in Oraki, 2014) proposes methods for quality assessment:

Intelligibility: scoring the translated sentences concerning their grammatical errors, wrong or untranslated words. Natural sentences in target language get high scores and the opposite group gets low scores.

Accuracy: intelligibility reflects a partial view of translation quality. The other important factor is the accuracy of the intended meaning of the source language which is scored after scoring intelligibility.

Error Analysis: MT errors are the other factor. Error analysis in this respect tries to show to what degree errors affect the translation.

Test Suite: Some tests to determine specified set of behaviors of a program. Such tests provide instructions and information about the system configuration.^{iv}

2.2. Works done in Iran

2.2.1 Translation of adverbial clauses

There are lots of considerable elements in investigation of accuracy of a translation work which is done by a TM. Adverbial clauses are complex forms of grammar and can be tricky for a TM to translate. This research was conducted to investigate the accuracy of adverbial clause translation from English to Arabic considering the famous book "The Old Man and The Sea" by American writer, Hemingway and its translation in Arabic translation by "Google Translate" The study used the Halliday's theory of functional grammar and Newmark's theory of semantic and communicative translation to analyze the chosen data. The result shows that

"There are some deviations of the English adverbial clause in the translation process, such as adding new elements or.... These deviations have affected the conveyance of the adverbial beta clause intended meaning in the target text"^v

2.2.2 Translation of Persian to English

Although there are many studies on Google Translate, few researchers have considered Persian-English translation. One study was conducted (Hadis Ghasemi & Mahmood

Hashemian,2016) based on Keshavarz's (1999) model of error analysis for a comparison between the raw English-Persian translations and Persian-English translations from Google Translate. The selected data was 100 systematically selected sentences from an

interpreter application called Motarjem Hamrah which was translated by Google Translate.

" Summing up the results, it can be concluded that the difference between the frequencies of different types of English-to-Persian and Persian-to-English errors did not reach statistical significance; therefore, the direction of translation did not affect the quality of translation of machine translations "^{vi}

Another research regarding the accuracy and quality of translation of English to Persian was conducted (Hakiminejad Afshin and Mohammad Ali Alaeddini,2016). The purpose was to examine the efficiency of Google translation in translating verb tense from English to Persian, and how much translation of Google translation is acceptable, and what are the areas which are possible to find errors in errors in. The research was conducted on, Google translated four passages of Oliver Twist. The Google translations were compared with the translation of Gharib based on the chosen method for the domain and extent of errors. The results were analyzed in terms of accuracy and appropriateness.

"The findings of the study showed that Google Translate is not able to translate verb tense from English to Persian and the translations are not acceptable. most of the grammatical errors occurred in translation of aspects, passives, and compounds, respectively"

One of the few researchers that are interested in this field is Mirzaeiyan Vahid Reza who did a paper surveying the challenges of translating texts of Persian language using 3 distinguished TM systems named Padideh, Pars and Google translate. As he indicates *"there is a long way ahead to attain systems capable of producing perfect translations."*^{vii}

2.2.3. Translation of Persian adjectives

Another researcher conducted a paper which was closer to our point of concern. Abouzar Oraki's research focused on the various sorts of adjectives in Farsi in order to determine the quality of the translation of Google Translate

system. It translated each of the four sorts of adjectives (simple adjectives, comparative adjectives, superlative adjectives, and adjectives of similarity) independently. The result of his study revealed that Google Translate is amazingly superb at translating simple adjectives (% 100), comparative adjectives (% 100) and the accuracy of translating superlative adjectives was (% 94). Yet it did not function so good at translating adjectives of similarity. Only

nearly 5.7 percent of the adjectives were correctly translated. This revealed that users may trust translations of Google translator for simple, comparative, and superlative adjectives, but for similarity adjectives, a type of human aided machine translation (machine translation with the assistance of a human translator) or editing is required for good outcomes.

2.2.4. Machine translation problems

On the issue of machine translation without human checking, two other researchers (Falahati & Nemati) stated that the root of today's problems with translation machines can be found in three points: ^{viii}

1. Inaccurate programs that are given to the machine and are the result of a lack of programmer information. In order to have suitable programs, experienced linguists should be included in the group of programmers in order to provide appropriate models to programmers by analyzing different language structures.
2. With the weakness of linguistic theory, it is natural that language cannot be studied in isolation. Even when we talk about linguistic sounds, we need meaning. If the theory of language is modified to include meaning, another part of the problems of translation machines can be solved.
3. If we can somehow give the machine such power — that is, the same blessing that God has given us (which, of course, seems unlikely to be achieved), the problems of translation machines can be solved. ^{ix}

2.2.5. Comparison of translation machines

In 2018, Taleghani and Pazouki did a comparative assessment research of four free online translation machines which were Bing, Google, Freetranslation and Targoman in terms of translation of idioms and phrasal verbs from English to Persian. 10 Sample texts (out of 60) including 110 idioms like keep somebody in the dark, more or less, have the situation, if need be, I lost count, give somebody a lift, on duty, keep quiet, etc. were chosen from "Oxford word skills: idioms and phrasal verbs". They were given to the target online translators (Further checks showed that www.bing.com and www.freetranslation.Org use the same datasets and their results were just the same so one of them was neglected.) and then all translations were compared to their correct meanings according to Aryanpur English to Persian dictionary. 5 idioms were omitted as no matches were found for them. During the last step, those target online translators were ranked

considering their performance.

The final results proved that Targoman was the best translator among other translation machines. ^x

In 2022, Ashrafi attempted to examine two machine translations such as Google and Targoman by BLEU evaluation method. BLEU (BiLingual Evaluation Understudy) is a metric for automatically evaluating texts that are translated using a machine. The BLEU score is a number between 0 and 1 measuring the resemblance of the machine-translated text to reference translations. He evaluated five disciplines of genetic engineering, linguistics, psychology, computer and chemistry. Examining the data of both machines, the results showed that Google performed much better than Targoman because it scored better in all areas. As written in the paper, In the near future, the main investment can be on Google translation machine, which is the largest translation machine in the world. ^{xi}

3. Methodology

The focus of this paper was on adverbs. Adverbs are one of the components of grammar which have a special position. Recognizing the type of adverb might even be difficult for native speakers of a language. It is quite clear that recognizing an adverb and translating it into another language is not easy for a translation machine, thus; translation errors are inevitable. Regarding the comparative purpose, the current descriptive paper is considered as comparative qualitative research. Translation quality of two different TMs are being described and evaluated according to the machine translation quality assessment model of Arnold (1994). The significant factors of this model are: Intelligibility, Accuracy, Error analysis and Test suite.

3.1. Data collection procedure

Firstly, a test suite of 64 English sentences consisting of adverbs of different types were randomly and manually chosen and copied from the source language texts in social media, internet, books and common speech. Secondly,

they were sorted out in different categories including adverbs of time, frequency, place, manner, degree, reason, relative and attitude.

3.2. Data analysis procedure

The mentioned sentences were translated into Persian language using both TMs. Through the next step, the function result of TMs was critically analyzed and compared with the intended meaning or reference translation* of the adverbs in the sentences of original language. The translation of adverbs or adverbial phrases was the point of focus, the intended meaning of the whole source sentence could have been transferred either completely or not completely. For the last step, the acceptability rate and frequency

of correctness or incorrectness of the machines for different adverb categories was indicated.

There was no human interference for post-editing or pre-editing the translated sentences. The survey aims mostly at comparing the semantic and communicative features rather than structure and syntax.

*An obvious method for evaluating machine translation output is to look at the output and say

whether it is correct or not.

Bilingual evaluators who understand both the input and output language are best qualified to make this judgment. Such bilingual evaluators are not always available, so we often have to resort to monolingual evaluators who understand only the target language but are able to judge system output when given a reference translation

1. Data analysis

4.1. Adverbs of time: Adverbs of time show when an action happened.

Sentence 1: Robin Hood stole the crown later.

Table 1

Reference	Google	Targoman
بعدا رابین هود تاج را دزدید.	رابین هود <u>بعدا</u> تاج را دزدید.	رابین هود <u>بعدا</u> تاج را دزدید.
Explanation		
The translations are both the same and exact.		

Sentence 2: Can the doctor see me today?

Table 2

Reference	Google	Targoman
دکتر امروز میتواند مرا ببیند؟	آیا دکتر می‌تواند مرا <u>امروز</u> ببیند؟	دکتر <u>امروز</u> میتواند منو ببیند؟
Explanation		
Both are well-translated.		

Sentence 3: Have you finished yet?

Table 3

Reference	Google	Targoman
هنوز تمام نکرده‌اید؟	<u>هنوز</u> تمام نکردید؟	<u>هنوز</u> تمام نشده؟
Explanation		
About the meaning both are correct. The difference is in being whether active or passive.		

Sentence 4: Until then I'm living with her.

Table 4

Reference	Google	Targoman
تا آن زمان با او زندگی می کند.	تا آن زمان من با او زندگی می کنم.	تا آن زمان با او زندگی می کنم.
Explanation		
Google did it right. Targoman's was correct in terms of adverb but not in terms of equivalence of the sentence.		

Sentence 5. Finally he pulled away.

Table 5

Reference	Google	Targoman
بالاخره خودش را کنار کشید.	بالاخره خودش را کنار کشید.	بالاخره خودش را کنار کشید.
Explanation		
Both were exact.		

Sentence 6. Joe's already here, so we can begin.

Table 6

Reference	Google	Targoman
از همین حالا می توانیم شروع کنیم. حالا که جو اینجا است، می توانیم شروع کنیم.	جو در حال حاضر اینجا است، بنابراین می توانیم شروع کنیم.	از همین حالا می توانیم شروع کنیم.
Explanation		
The translation of Targoman is not complete and not right regarding the adverb but that of Google is.		

Sentence 7. We've started the project since 2010.

Table 7

Reference	Google	Targoman
ما این پروژه را از سال ۲۰۱۰ آغاز کرده ایم. ما این پروژه را از سال ۲۰۱۰ شروع کرده ایم. این پروژه را از سال ۲۰۱۰ شروع کرده ایم.	ما این پروژه را از سال ۲۰۱۰ آغاز کرده ایم. ما این پروژه را از سال ۲۰۱۰ شروع کرده ایم. این پروژه را از سال ۲۰۱۰ شروع کرده ایم.	ما این پروژه را از سال ۲۰۱۰ آغاز کرده ایم.
Explanation		
Both are the same and correct.		

Sentence 8. She decided to leave immediately.

Table 8

Reference	Google	Targoman
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او تصمیم گرفت فوراً آنجا را ترک کند.	تصمیم گرفت فوراً آنجا را ترک کند.	تصمیم گرفت فوراً آنجا را ترک کند.
Explanation		
Both are the same and correct.		

4.2. Adverbs of frequency: They describe how often an action happens.

Sentence 1: Please take this pill nightly.

Table 9

Reference	Google	Targoman
لطفاً این قرص را هر شب مصرف کنید.	لطفاً این قرص را <u>شبانه</u> بخورید.	لطفاً این قرص را <u>شب</u> بخورید.
Explanation		
The adverb “nightly” means every night. Targoman just focuses on night and google says at night time. Considering the meaning of adverb neither of them fulfill the ST purpose.		

Sentence 2: The last editor occasionally made mistakes.

Table 10

Reference	Google	Targoman
آخرین ویراستار <u>گاهی</u> اشتباه میکرد.	آخرین ویراستار <u>گاهی</u> اوقات اشتباه میکرد.	آخرین ویراستار <u>گاهی</u> اشتباه میکرد.
Explanation		
Both are well-translated.		

Sentence 3: The board of directors meet up quarterly.

Table 11

Reference	Google	Targoman
هیئت مدیره <u>هر سه ماه</u> تشکیل جلسه میدهد.	هیئت مدیره <u>هر سه ماه یکبار</u> تشکیل جلسه می دهد. هیئت مدیره سالی 4 بار جلسه تشکیل میدهد.	هیئت مدیره <u>هر سه ماه</u> تشکیل جلسه میدهد.
Explanation		
Regarding the meaning of adverb, Targoman did not do it correctly.		

Sentence 4: Hardly ever did she go on holiday.

Table 12

Reference	Google	Targoman
خیلی کم پیش می آمد که به تعطیلات برود.	او <u>به سختی</u> به تعطیلات رفته است	به ندرت به تعطیلات می رفت.
Explanation		
Targoman gave us an exact translation but Google's was literal and consequently wrong.		

Sentence 5: Trash is collected every other day.

Table 13

Reference	Google	Targoman
	زباله ها <u>هر روز</u> جمع آوری می شوند. زباله ها <u>یک روز در میان</u> جمع آوری می شوند. زباله ها یک روز در میان جمع آوری میشوند..	
Explanation		
Google gave us an exact translation but Targoman’s was wrong.		

Sentence 6: Only infrequently is there a formal link.

Table 14

Reference	Google	Targoman
	فقط <u>به ندرت</u> پیوند رسمی وجود دارد.	تنها <u>به ندرت</u> یک ارتباط رسمی وجود دارد. آید..
	به ندرت پیوند رسمی بوجود می	
Explanation		
Both are the same and correct.		

Sentence 7: The newspaper came out weekly.

Table 15

Reference	Google	Targoman
	روزنامه <u>به صورت هفتگی</u> منتشر می شد.	روزنامه <u>هر هفته</u> منتشر می شد.
	روزنامه هر هفته منتشر می شد.	
Explanation		
Both are correct.		

Sentence 8: Neither of us had ever skied.

Table 16

Reference	Google	Targoman
	هیچ کدام از ما <u>تا به حال</u> اسکی نرفتیم.	هیچ کدام از ما <u>تا به حال</u> اسکی نکرده بودیم.
	هیچ کداممان تا به آن زمان اسکی نرفته بودیم.	
Explanation		
Both are the same and correct.		

4.3. Adverbs of place: Adverbs of place always talks about the location

where the action of the verb is being carried out.

Sentence 1: I saw her here.

Table 17

Reference	Google	Targoman
اینجا دیدمش.	<u>اینجا</u> دیدمش.	من او را <u>اینجا</u> دیدم.
Explanation		
Both translations are acceptable.		

Sentence 2: You can see it If you go down.

Table 18

Reference	Google	Targoman
اگر پایین بروی آن را می بینی.	اگر <u>پایین</u> بروید می توانید آن را ببینید.	می تونی ببینیش. اگر بری <u>پایین</u> .
Explanation		
The adverb is translated correctly but considering Targoman's performance, the adverb is following the verb and even two dots are observed which means it identifies the whole English sentence as two.		

Sentence 3: Next to the bank was a park.

Table 19

Reference	Google	Targoman
کنار بانک یک پارک بود.	<u>کنار</u> بانک یک پارک بود.	<u>کنار</u> ساحل پارک بود.
Explanation		
The adverbs are well-translated.		

Sentence 4: They live in a house nearby.

Table 20

Reference	Google	Targoman
آنها در خانه ای در همان نزدیکی زندگی میکنند.	آنها در خانه ای <u>نزدیک</u> زندگی می کنند.	آنها در خانه ای در <u>همان نزدیکی</u> زندگی میکنند.
Explanation		
The adverbs are well-translated.		

Sentence 5: We had to take

the engine apart.

Table 21

Reference	Google	Targoman
می‌بایست موتور را از هم جدا کنیم.	مجبور شدیم موتور را از هم جدا کنیم.	باید موتور را از هم جدا می کردیم.
Explanation		
The adverbs are the same and well-translated.		

Sentence 6: You should move Eastward.

Table 22

Reference	Google	Targoman
باید به سمت شرق حرکت کنید.	شما باید به سمت شرق حرکت کنید.	تو باید به سمت شرق حرکت کنی.
Explanation		
The adverbs are the same and well-translated.		

Sentence 7: When you go upstairs, bring the towels.

Table 23

Reference	Google	Targoman
وقتی به طبقه بالا می روید، حوله ها را بیاورید. وقتی رفتی طبقه بالا حوله ها رو هم بیاار..	وقتی به طبقه بالا رفتید، حوله ها را بیاورید. وقتی رفتی طبقه بالا حوله ها رو هم بیاار..	وقتی به طبقه بالا می روید، حوله ها را بیاورید. وقتی به طبقه بالا رفتید، حوله ها را بیاورید. وقتی رفتی طبقه بالا حوله ها رو هم بیاار..
Explanation		
The adverbs are the same and well-translated.		

Sentence 8: Everyone was indoors on such a night.

Table 24

Reference	Google	Targoman
در چنین شبی همه در خانه بودند.	در چنین شبی همه در خانه بودند.	در چنین شبی همه در خانه بودند.
Explanation		
The adverbs are the same and well-translated.		

4.4. Adverbs of manner: Adverbs that shows how someone does something

or how something happens.

Sentence 1: He fights bravely.

Table 25

Reference	Google	Targoman
او دلاورانہ میجنگد.	او شجاعانہ مبارزہ می کند.	اون شجاعانہ جنگید.
Explanation		
The adverbs are well-translated.		

Sentence 2: He thinks he sings well.

Table 26

Reference	Google	Targoman
فکر میکند خوب آواز میخواند.	فکر می کند خوب می خواند.	خیال میکند خوب آواز میخواند.
Explanation		
The adverb “well” is properly translated		

Sentence 3: I was watching him carefully.

Table 27

Reference	Google	Targoman
داشتم با دقت او را نگاه می کردم.	با دقت مراقبش بودم.	من اونو با دقت بررسی کردم.
Explanation		
Both translated adverbs are nice.		

Sentence 4: The children were playing noisily.

Table 28

Reference	Google	Targoman
بچه ها با سروصدای زیادی بازی میکردند..	بچه ها پر سر و صدا بازی می کردند.	بچه ها با سر و صدا بازی می کردند.
Explanation		
Both translated adverbs are nice.		

Sentence 5: They had arrived unbelievably.

Table 29

Reference	Google	Targoman
در کمال ناباوری، آن ها رسیده بودند.	باور نکردنی آمده بودند.	آن ها به طرز غیر قابل باوری رسیده بودند.
Explanation		

Targoman's translation in terms of adverb is right but Google's is not.

Sentence 6: She was crying openly now.

Table 30

Reference	Google	Targoman
حالا آشکارا گریه می کرد.	او اکنون آشکارا گریه می کرد	حالا علنا گریه می کرد.
Explanation		
Both translated adverbs are nice.		

Sentence 7: My opinions are equally valid.

Table 31

Reference	Google	Targoman
نظرات من همان اندازه معتبرند.	نظرات من به همان اندازه معتبر است.	نظرات من هم به همان اندازه معتبر است.
Explanation		
Both translated adverbs are the same and nice.		

Sentence 8: The projects were inadequately funded.

Table 32

Reference	Google	Targoman
بودجه پروژه ها کافی نبود.	بودجه پروژه ها به اندازه کافی نبود.	بودجه این پروژه ها کافی نبود.
Explanation		
Both translated adverbs are nice.		

4.5. Adverbs of degree: Adverbs of degree tell us about the intensity of something.

Sentence1: There are few books on the shelf.

Table 33

Reference	Google	Targoman
تعداد کمی کتاب روی قفسه است.	تعداد کمی کتاب در قفسه وجود دارد.	چند کتاب در قفسه کتاب هست.
Explanation		
The adverb “few” is translated as چند، تعدادی which is true but this adverb also points that this number of items does not fulfill the need. Google presents that properly whereas Targoman fails to show the hidden meaning.		

Sentence 2: I don't like Much

sugar.

Table 34

Reference	Google	Targoman
شکر زیادی را دوست ندارم.	من شکر زیاد دوست ندارم.	من از شکر زیاد خوشم نمی آید.
Explanation The function of “Much” is not well-transferred in the sentence of Targoman. It brings the idea of “I don’t really like sugar.”		

Sentence 3: I’m awfully in love with her.

Table 35

Reference	Google	Targoman
بدجوری عاشقشم.	من بدجوری عاشقش هستم.	من خیلی عاشقش هستم.
Explanation “Awfully” here means a lot but in an awful way. Google transmits the content of this word well but Targoman doesn’t.		

Sentence 4: It is virtually true.

Table 36

Reference	Google	Targoman
کمابیش درست است.	عملاً درست است.	این واقعاً درست است.
Explanation Both are correct but the translation of Google is closer to the meaning rather than Targoman’s.		

Sentence 5: I’m terribly disappointed.

Table 37

Reference	Google	Targoman
به شدت ناراحتم.	من به طرز وحشتناکی ناامید هستم.	من به شدت ناامید شده ام.
Explanation Both are correct but the translation of Targoman is more natural in Persian.		

Sentence 6: The rope isn't long enough.

Table 38

Reference	Google	Targoman
طناب به اندازه کافی بلند نیست.	طناب به اندازه کافی بلند نیست.	طناب به اندازه کافی بلند نیست.
Explanation		
Both are the same and correct.		

Sentence 7: I highly recommend this book.

Table 39

Reference	Google	Targoman
این کتاب را بسیار توصیه می‌کنم.	من <u>شدیدا</u> این کتاب را توصیه می‌کنم.	من این کتاب را <u>بسیار</u> توصیه می‌کنم.
Explanation		
Both are both correct.		

Sentence 8: He felt somewhat awkward in his suit.

Table 40

Reference	Google	Targoman
با کت و شلوار احساس تقریبا احساس ناخوشایندی داشت.	او در کت و شلوار خود احساس ناخوشایندی می‌کرد.	در کت و شلوارش احساس ناراحتی می‌کرد.
Explanation		
None of them translated this adverb.		

4.6. Adverbs of reason: They express the reason, an aim or target behind the happening of a particular action.

Sentence 1: They consequently become cautious.

Table 41

Reference	Google	Targoman
در نتیجه محتاط می‌شوند.	در <u>نتیجه</u> محتاط می‌شوند.	در <u>نتیجه</u> محتاط می‌شوند.
Explanation		
Both are the same and correct.		

Sentence 2: Could she

sustain the sacrifice she had resultantly made?

Table 42

Reference	Google	Targoman
آیا می توانست فداکاری خود را حفظ کند آیا او می تواند فداکاری را که در نتیجه انجام داده بود حفظ کند؟ آیا می توانست فداکاری که در آخر انجام داده بود را حفظ کند؟		
Explanation		
Targoman skipped the translation of this adverb. Google translated it, though it was literal and did not fit the sentence.		

Sentence 3: They were subsequently trained for 4 weeks.

Table 43

Reference	Google	Targoman
پس از آن به مدت 4 هفته آموزش دیدند. آنها متعاقباً به مدت 4 هفته آموزش دیدند. پس از آن به مدت 4 هفته آموزش دیدند.		
Explanation		
Both are correct.		

Sentence 4: They therefore can do nothing good.

Table 44

Reference	Google	Targoman
بنابر این آن ها نمی توانند کار خوبی انجام دهند. بنابر این آنها نمی توانند هیچ کار خوبی انجام دهند. پس نمی توانند کار خوبی بکنند.		
Explanation		
Both are correct and the same.		

Sentence 5: Let's start the meeting now that everyone's here.

Table 45

Reference	Google	Targoman
حالا که همه آمده اند جلسه را شروع کنیم. بیایید جلسه را از الان شروع کنیم که همه اینجا هستند. حالا که همه هستند، بیایید جلسه را شروع کنیم.		
Explanation		
Both are correct but Targoman did a better job.		

Sentence 6: Roads are closed owing to drifting.

Table 46

Reference	Google	Targoman
جاده ها به دلیل رانش بسته است.	جاده ها به دلیل رانش بسته است.	جاده ها به خاطر رانش بسته شده اند.
Explanation		
Both are correct and the same.		

Sentence 7: She is sick; thus, I cook.

Table 47

Reference	Google	Targoman
او بیمار است پس آشپزی میکنم.	او مریض است، بنابراین من آشپزی می کنم.	او مریض است و من هم آشپزی میکنم.
Explanation		
Unlike Google, Targoman's is just wrong.		

Sentence 8: It is very late; hence you must go to bed.

Table 48

Reference	Google	Targoman
خیلی دیر است پس باید به رختخواب بروی.	خیلی دیر است؛ از این رو باید به رختخواب بروید.	خیلی دیر است، پس باید به رختخواب بروی.
Explanation		
Both did well but Google is a little bit uncommon.		

4.7. Relative adverbs: Relative adverbs connect nouns to relative clauses or

Refer the subordinate clause to the main part of the sentence.

Sentence 1: This is the cafe where I was.

Table 49

Reference	Google	Targoman
این همان کافه ای ست که در آن بودم.	اینجا همان کافه ای است که من در آن بودم.	این کافه ای است که من آنجا بودم.
Explanation		
Both are correct and the same.		

Sentence 2: I remember the day when we met.

Table 50

Reference	Google	Targoman
روز آشنانشان را به خاطر دارم.	یاد روزی افتادم که همدیگر را دیدیم.	روزی را به یاد می آورم که با هم آشنا شدیم.
Explanation		
Both are correct and the same.		

Sentence 3: Tell me why you went out.

Table 51

Reference	Google	Targoman
بهم بگو چرا رفتی بیرون.	بگو چرا بیرون رفتی.	به من بگو چرا بیرون رفتی.
Explanation		
Both are correct and the same.		

Sentence 4: It's the place in which we camped.

Table 52

Reference	Google	Targoman
اینجا همان جاییست که کمپ زدیم.	جایی است که در آن کمپ زدیم.	اینجا همان جایی است که ما در آن چادر زدیم.
Explanation		
Both are correct and the same.		

Sentence 5: He explained the reason for which he did that.

Table 53

Reference	Google	Targoman
دلیل کارش را توضیح داد.	او دلیل این کار را توضیح داد.	او دلیل این کار را توضیح داد.
Explanation		
The adverbs are not translated but the meaning is totally well-transferred via the target structure.		

Sentence 6: I can tell you why it is correct.

Table 54

Reference	Google	Targoman
می توانم دلیل درستی آن را به شما بگویم.	می توانم به شما بگویم چرا درست است.	می توانم به شما بگویم که چرا درست است.

Explanation
Both are correct.

Sentence 7: Give me the recipe of what you cooked.

Table 55

Reference	Google	Targoman
دستور پخت چیزی را که پخته اید به من بدهید. دستور غذای پخته شده را به من بدهید. دستور پخت غذایی را که درست کردی، به من بده.		
Explanation		
Targoman translated the adverb but Google did not. However, the meaning is transmitted using a good Persian structure. (Clause to adjective)		

Sentence 8: There's the girl whose car was stolen.

Table 56

Reference	Google	Targoman
این همان دختری است که ماشینش دزدیده شده است. این همان دختری است که ماشینش دزدیده شده. اون دختره که ماشینش دزدیده شده. این همان دختری است که ماشینش دزدیده شده است.		
Explanation		
Both are correct.		

4.8. Attitude adverbs: Attitude adverbs express the writer's attitude toward

an action or situation described in the sentence.

Sentence 1: Social mobility was constant and frankly recognized.

Table 57

Reference	Google	Targoman
تحرك اجتماعي ثابت و صريح بود. تحرك اجتماعي ثابت بود و صراحتاً به رسميت شناخته ميشود. تحرك اجتماعي مداوم و صراحتاً شناخته شده بود..		
Explanation		
Targoman did not translate the adverb but Google did it well.		

Sentence 2: Fortunately Alex didn't notice.

Table 58

Reference	Google	Targoman
خوشبختانه الكس متوجه نشد. خوشبختانه الكس متوجه نشد. خوشبختانه الكس متوجه نشد.		

Explanation
Both are the same and correct.

Sentence 3: Luckily for them, he braked in time.

Table 59

Reference	Google	Targoman
خوشبختانه به موقع ترمز گرفت.	خوشبختانه او به موقع ترمز کرد.	خوشبختانه به موقع ترمز کرد.
Explanation		
Both are the same and correct.		

Sentence 4: I personally would welcome it.

Table 60

Reference	Google	Targoman
بشخصه پذیرای آن خواهم بود.	من شخصاً از آن استقبال خواهم کرد.	من شخصاً از آن استقبال می کنم.
Explanation		
Both are the same and correct.		

Sentence 5: It was hopefully my only trip with them.

Table 61

Reference	Google	Targoman
امیدوارم تنها سفرم با آن ها، بوده باشد.	امیدوارم تنها سفر من با آنها باشد.	خوشبختانه این تنها سفر من با آن ها بود.
Explanation		
Targoman's translation is wrong but that of Google is right.		

Sentence 6: Interest is only payable on the amount actually borrowed.

Table 62

Reference	Google	Targoman
بهره فقط براساس مبلغ قرض گرفته شده قابل پرداخت است. سود فقط به مبلغ واقعی قرض، قابل پرداخت است.	بهره فقط به مبلغ واقعی قرض شده قابل پرداخت است.	بهره فقط براساس مبلغ قرض گرفته شده قابل پرداخت است.
Explanation		
Targoman did not translate it but Google was right.		

Sentence 7: Can you honestly say you're sorry?

Table 63

Reference	Google	Targoman
می‌توانی صادقانه اظهار پشیمانی کنی؟	آیا می‌توانید صادقانه بگویید که متأسفید؟	آیا می‌توانی صادقانه بگویی که متأسف هستی؟
Explanation		
Both are the same and correct.		

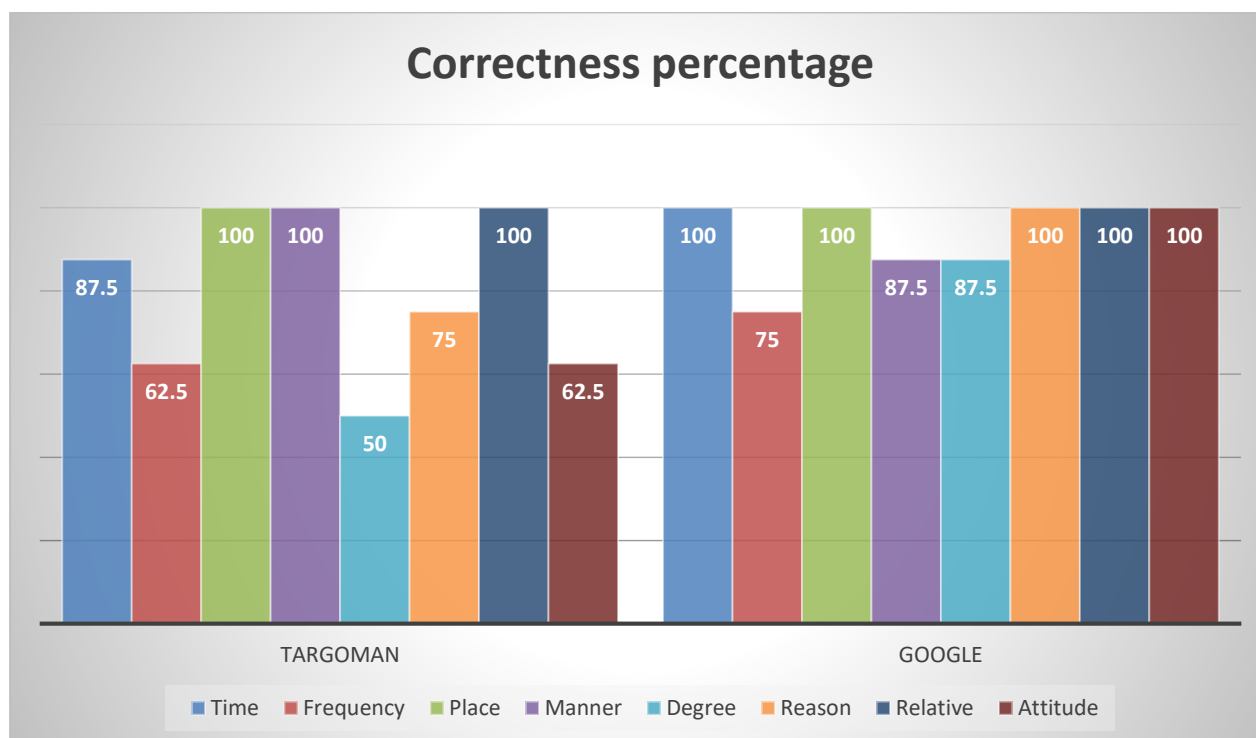
Sentence 8: The man is apparently a serial killer.

Table 64

Reference	Google	Targoman
این مرد ظاهراً قاتلی زنجیره ای است.	این مرد <u>ظاهراً</u> یک قاتل زنجیره ای است.	این مرد <u>ظاهراً</u> یک قاتل زنجیره ای است.
Explanation		
Both are the same and correct.		

According to the tables above, it is concluded that the authenticity percentage of the two machines regarding the translation of different adverb types is:

Figure 1



4. Conclusion

Translation machines are helpful in many cases but there are some mistakes which is totally inevitable as the machines are not fully able to do what human's brain can. Comparing these two translation machines in all aspects was beyond the main goal of this research and the focus was on translation of adverbs from English to Persian. Eight random sentences containing adverbs were put into each single category of adverbs. Regarding the first category which is adverb of time, Google was 100% accurate (8 correct translations out of 8 adverbs) and Targoman was 87.5% accurate (7 out of 8 were correct). In the case of adverb of frequency, Google was 75% correct (6 out of 8) and Targoman about 62.5% (6 out of 8). Considering the adverbs of place, both machines functioned

flawlessly and were 100% correct. In the category of adverbs of manner, Targoman was superb (100%), whereas Google had a mistake and it was 87.5% right (7 out of 8). The result of Google for adverb of degree was 87.5% correct (7 out of 8) and that of Targoman was just 50% (4 out of 8). Regarding the adverb of reason, Google was 100% correct, whilst Targoman had two mistakes and was 75% correct. Observing the category of relative adverbs, both machines performed excellently. Concerning the attitude adverb, contrasting to Google which was 100% correct, Targoman was not correct in three cases and it was 62.6% correct.

Not limiting the adverbs in some categories and summing them all up, Google was 93.75% right regarding the translation of adverbs and Targoman was 79.68% right.

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