

A Review of Literature of Computer-Assisted Translation

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Abstract

This research paper reviews the literature on the use of computer in translation. This review aims at understanding how computers have been implemented to foster translation. This review investigates the studies that have dealt with computer-assisted translation (CAT). Specifically, it reviews the studies that have explored the benefits of CAT; factors affecting the use of the computer in translation, the limitations of CAT, and current advancement in this area. The review discusses the findings of these studies and suggests guidelines for future research studies in this area. It concludes that further studies are necessary to investigate the use of CAT in translating cultural Arabic terms. Also, further studies are necessary to determine the principles that are required to implement computer tools in translation.

Keywords: computer-assisted translation, machine translation, Google Translate, on-line translation, translation.

Introduction

Translation plays a crucial role in the interaction between distinct cultures. Translation is supposed to bring languages close to each other. By translation, people of different places can communicate among themselves. This process can be carried out by human translators or some machine translation applications, or by a combination of both (i.e. computer-assisted/aided translation). Computer-assisted translation (CAT) is the

developments of computer technology that have created new opportunities for translators that cannot be found in traditional ways.

Many studies and books have been published about the uses of CAT (e.g. Balkul 2016; Lin, 2010; Vidhayassai, Keyuravong & Bunsom 2015). They have discussed a wide range of topics such as opportunities and challenges of using CAT systems, the defects of machine translation (MT), the outcome of online applications, the influence of CAT systems on translator's workflow, the position of "translation Technology" in the field of translation and the dilemma between translation industry and academia.

These studies need to be reviewed to help the researcher to find out the areas that were not explored or not fully examined. Therefore, the present study tries to shed light on the areas that require more attention. The purpose of this review is to answer the following questions:

- 1- *What is the current status of CAT in comparison to other techniques?*
- 2- *What are the general factors affecting the implementation of CAT in translation?*
- 3- *What are the major translation theories that can be used as a framework for translation studies?*
- 4- *What are the limitations of CAT in comparison to human translation?*
- 5- *What is the impact of CAT on human translators?*

Review of Literature

Translation as a term is a controversial issue in the sense that one finds more than one definition, each definition exposes a different view and a theoretical background of the translation, but the aim of translation is finding the proper equivalences. (Newmark, 1988) points out that translation is a craft consisting in the attempt to replace a written message and/or statement in one language by the same message and/or statement in another language (p.7).

(Hutchins 1992) defines the term Machine Translation (MT) as the traditional and standard name for computerized systems responsible to produce translations from one language into another, with or without

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human assistance (p.3). Computer-aided/assisted translation (CAT) is the use of computer software to assist a human translator in the translation process. The term applies to translation that remains primarily the responsibility of a human but involves software that can facilitate certain aspects of it. Indeed, it is helpful to consider that the CAT is a vital part in the field of translation, where various degrees of the machine or human assistance are involved. Based on the definitions, it is obvious that the difference between CAT and MT is that (MT) refers to translation that is carried out principally by computer systems, while CAT is only as an assistant to a human translator, i.e. The human translator carries out all the processes of translation and his/her use of CAT is only as assistance.

Historical Background of MT and CAT

To study CAT it is necessary to take a look at MT. The use of mechanical dictionaries to bridge the barriers between languages was first suggested in the 17th century (Hutchins& Somers 1992). In 1629, Descartes may have been the first to propose the idea that the language could be represented by codes and those words of different languages with equivalent meaning could share the same code. Esperanto, invented language, was invented by Zamenhof. He created this language to reduce the "time and labor" that we spend in learning foreign languages, and it bridges the barriers of languages. It connects and brings harmony between people of different countries.

In 1933, two patents appeared independently in France and Russia. A French-Armenian, George Artsrouni, had designed a storage device on paper tape which could be used to find the equivalent of any word in another language; a prototype was apparently demonstrated in 1937. The invention of the computer in the twentieth century led very quickly to attempt of using it for translation of languages, in the form of computer programs capable of translating a wide variety of texts from one language into another, but not of that desired quality. So, a human should get involved in the process of translation.

The first version of machine translation programs, which are considered as the first generation, were based on detailed bilingual dictionaries that offered a number of equivalent words in the target language for each word listed in the source language. In 1951, Yehoshua was a first full-time researcher in this field from the Massachusetts

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Institute of Technology (MIT). A year later, the first conference held in New York in the field of MT. And it introduced the first MT program in January 1954 when the American-Russian program was developed by (IBM) company.

In 1966, Automatic Language Processing Advisory Committee (ALPAC) produced a highly critical report that claimed that MT was slow, inefficient and expensive, concluding that it was not worth investing money in research in this field. However, it proposed the need to encourage the development of tools to assist the translation process, such as computer dictionaries, databases etc. However, research continued in France, Germany, and Canada. In 1980s important advances occurred to meet the huge demands for translation by the administrative and commercial needs of multilingual communities. There were many programs produced and one of them was Arianne which is considered as the second generation of MT programs which added to the first generation the feature of Translation memory.

The beginning of the 1990s, which can be called the third generation, saw vital developments in machine translation with a radical change in the strategy from translation based on grammatical rules to that based on bodies of texts and examples. These strategies can be summarized as follows:

- 1- The abandonment of the idea of translating literary or philosophical texts of high density and limited to deliberative texts.
- 2- Integration between machine translation and human-assisted translation on the one hand, and translation on the other hand to cover the widest possible field.
- 3- Expanding the translation memory and enriching it with large text codes, bilingual or multilingual dictionaries, and lexicons of proverbs, idioms and special combinations.
- 4- Making information banks open which allows the users to enrich the dictionaries and translation memory according to their needs and directing the destination they want.

It is clear that MT has shortcomings, so the translators, agencies, clients and companies shifted to more reliable way of mechanical translation which is CAT. CAT can be dated to 1980s. When

Japanese computer companies (Toshiba, sharp, NEC and on) worked on software to facilitate the translation process. A notable mark in the CAT history was the advent of the ALPS system in 1981 which was considered as the first CAT system. It offers the following: (1) multilingual word processing, (2) automatic dictionary, (3) terminology consultation, (4) interactive translation and (5) repetition extraction.

After the appearance of ALPS system many systems appeared. These systems are called “translation workstations”. The followings are some apps that were available in markets: SDL Trados (translator’s Workbench); STAR AG; IBM; Atril (Déjà vu); Xerox(xms); and MetaTaxis.

MT, CAT, and Human Translation

MT, CAT, and human translation are several ways for rendering the text of source language (SL) into target language (TL), but the way they operate differs from each other. In MT, the computer applications carry out the process of translation totally (e.g. Google Translate, and Microsoft Translator). The user of MT must input the text and the application carries out the entire process. In this scenario, the user may not well be familiar with the target language which may cause many mistakes. In CAT, the user may use the applications despite his competence in the target language. CAT, on the other hand, is an application that helps the translators in the process of translation. The user must be well qualified in both SL and TL. There are many applications that aid translators such as *Trados*, *Workfast* and so on. A human translator must be a qualified person to translate the text from SL into TL, either by using technological instruments or by traditional approach- pen and dictionary. Mostly the outcome of the human translator is of higher quality.

Human translation is more satisfactory. The computer can handle large volumes and can automatically maintain consistency, for instance, Google Translate can translate more than 100 languages. In brief, machine translation is ideal for large scale and/or rapid translation of (boring) technical documentation, but the human translator is (and may remain) unrivaled for non-repetitive linguistically sophisticated texts (e.g. in literature and law). In this way, there is no threat to the human translator

.There is no doubt that MT and human translation can and will co-exist in harmony and without conflict (Hutchins 1999).

Advantages and Disadvantages of CAT

CAT is a tool designed to assist human and speed up the rate of translation. Human translators sometimes fall under the pressure of challenging work, and they resort to such tools to facilitate such heavy tasks. Computers are used in translation and provide several advantages. The users of these tools can use them whenever they want. Furthermore, they are cheap, just download the applications then use them either online or offline. While the major cost for standard translation projects is the cost of the human translators. CAT tools can memorize key terms and phrases that are used within a given industry. This helps translators to recall the previous translated texts easily. They have the feature of the pre-translated grammatical and orthographic suggestions; these tools suggest to human translator what is more proper. CAT tools might be truly helpful and efficient in specific fields, but they may not so in other fields.

On the other hand, there are negative points can be traced back to the use of the computer in translation. The technology has improved dramatically in the past 30 years, but it is certainly still improving. Therefore, even after editing, the meaning from the original document will not be completely correct. CAT tools can obviously bring benefits to translators. Yet, some of the translators are unwilling to use this technology, because they need training of how to use specific applications. CAT tools are not capable enough to deal with literary texts and cultural terms as the variation of meaning behind each word and sentence are significant. CAT tools cannot avoid taboo words which sometimes strongly should be avoided. Generally speaking, CAT tools must be used with great care. Human translators must be aware of the type of text they are going to translate to meet their client's requirements.

Previous Studies about CAT

Several studies were carried out to explore the benefits of the integration of computer in translation. Balk et al, (2012) examined the accuracy of Google Translate of 8 foreign languages into English (Chinese, French, German, Italian, Japanese, Korean, Portuguese and Spanish). Their findings showed that while the programme could adequately translate German and Portuguese into English, it could not do well with oriental

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languages especially Chinese, having the lowest agreement between original texts and translated ones.

Vidhayassai, Keyuravong & Bunsom (2015) examined the use of GT in translating terms and condition in an airline website to find out errors and suggest implementation. Their study aimed at finding out the common errors in this field. Their findings were divided into three levels of errors – lexical, syntactic, and discursive. The findings indicated that the most frequently occurring errors in Google Translate can be found at the lexical level, at this level the errors traced back for non-equivalence between the SL and the TL leading to choose the wrong alternative. They found that in syntactic level, grammatical composition lacked correct order. Google Translate could not distinguish between active and passive. So, the outcome was hardly understood. This is the error at the discursive level where the recipients are unable to understand the translation.

Balkul (2016), argued about the position of “Translation Technology” in the field of translation. His study fell into two categories MT and CAT. He examined the translation tools that dealt with these classes: lexicographical, terminological aids and grammar. He thought that "translation theories were shaped under three main paradigms, linguistic turn, cultural turn, sociological turn. He concluded that theoretical translation studies have ignored translation technologies for a long time. He stated that both translation scholars and academia must reflect upon translation theories to catch up with the advances in technology. His paper asserts that linguistic approaches to translation, functional translation theories and sociological approaches to translation are all inspiration for translation technology-related research.

Quaranta. B (n.d.) dealt with Arabic and computer-aided translation. The aim of her study was to highlight the problems that translation tools are not adequately internationalized, which may cause and suggest a solution for problems found during translation with SDL Trados. She found that there were apparent difficulties with computer-aided translation in Arabic. She ascribed these difficulties to the fact that Arabic is different from other western languages.

Lin (2010) examined the significance of MT in the Post-modernized world, where almost everyone was able to use computer and surf the

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internet. He divided the users of the computer in the field of translation into two groups: (a) scholars who discussed usage and function and practical translators implementing the developed software in the field of working; (b) computational linguistics whose involvement of linguists, computer scientists, experts in artificial intelligence, mathematicians. He concluded that the translating tasks of the users and translators are more general and common, and the designing/ upgrading tasks need deeper training and professional knowledge in diverse fields of linguistics, sociolinguistics, and computer science.

Ghasemi & Hashemian (2016) conducted a comparative study of GT from English to Persian and vice versa. The main aim of their study was to investigate the quality of GT. They analyzed the errors of raw English – Persian translation and Persian – English from GT. They found that lexico- semantics scored the highest errors.

Craciunescu, Gerding-Salas & Stringer-O'Keeffe, (2004) explored the importance of translation technology in different spheres of modern life. They described the technology available to translators in the first decade of the twenty-first century and examine the negative and positive aspects of machine translation and of the main tools used in CAT: electronic dictionaries, glossaries, terminology databases, concordances, online bilingual texts and translation memories. They argue that the different aspects of modern life have led to the need for more efficient methods of translation.

Currently, the demand for translations is not satisfied because there are not enough human translators, or because individuals and organizations do not recognize translation as a complex activity requiring a high level of skill, and are therefore not prepared to pay what it is worth. They examined the new technologies in order to determine whether they change the relationship between the translator and the texts, and if so, then in what way.

Despite the advances in technology, machine translation still represents only a tiny percentage of the market. As shown in Table 2. 1 below by Loffler-Laurian, 1996, the uses of machine translation was very low in comparison to human translation.

Table 2.1 A comparison between human and machine translation (Loffler-Laurian, 1996)

	human translation	machine translation
Europe & the United States	300 million pages	2.5 million pages
Japan	150 million pages	3.5 million pages

Only 6 million pages were translated through machine translation, compared to 450 million through human translation, i.e. MT represented only 1.3% of the total. In their study they found these types of errors: (a) errors that change the meaning of the lexeme; (b) words or phrases that are apparently correct, but which do not translate the meaning in context; and (c) words without meaning and errors in usage. They concluded that both MT and CAT were not efficient and accurate enough to remove the necessity for human translators. They recommend translators to recognize and learn to exploit the potential of the new technologies to help them to be more rigorous, consistent and productive without feeling threatened.

Costales, (2010) studies the role of CAT in the field of software localization. His study intended to calibrate how CAT could improve translators' performance. This study outlined some challenges and difficulties of software localization. He found that CAT could improve the performance of translators and improve text consistency and terminological coherence. They helped in saving times by recycling previously translated strings.

Nagipoor and Abedin (2013) investigated the emergence of CAT tools. They claimed the emergence of these tools due to the lack of professional translators. Their study aimed at exploring how such tools could be integrated with MT. They concluded that CAT let profession of translators undergo major changes despite the failure of the organization of encouraging translators to use CAT.

Lin (2016) explored the influence of the CAT software on the efficiency of English –Chinese technical translation. The study revealed that the translators were influenced by the suggestions that were presented by these tools. He ascribed this to the lack of experience of translators.

Regardless their limitations, CAT and MT tools can be useful tools to help human translators and they may enhance the process of translation. There is a need to discover the factors that may affect the integration of CAT tools into translation and to what extent CAT tools can help translators to translate effectively. As far as the authors know, there is no study has been conducted to examine the impact of CAT tools on translation. Therefore, this study is an attempt to fill in this gap in knowledge and provide a comprehensive review of CAT and its impact on translation.

Methods

This review has employed several procedures in the collection and analysis of articles related to the integration of computer technology into translation. First, a keyword search using "computer-assisted translation", "online translation" and "machine translation" was performed in Education Resources Information Centre (ERIC), SCOPUS, EBSCO and Proquest online databases. For the keywords, around 50 articles were found. The results of these studies were carefully checked. Then, 40 studies were selected for the review since they matched the keywords of this article and covered the uses of computer in translation.

The selected studies were published in 10 journals, 2 book chapters, and one conference proceeding.

Results and Discussion

What is the status of CAT in comparison to other techniques?

Many professionals claimed that MT is not qualified to produce perfect translations. The developers paid more attention to CAT tools, as the result, the translators resorted to CAT tools. The status of CAT is promising. Different institutions try to improve these tools from time to time. CAT tools are very fruitful for translators if these translators are well qualified in handling them. The translators must be trained on using these tools. There are online and offline tools, this facilitates the process of translation when there is no internet connection. In comparison to other devices of translation such as mobile translation and MT. CAT seems more preferred by human translators. The snowballing acceleration of available information, and the increase in intercultural encounters have resulted in drastic and lasting changes in the way translators work. Translators will learn and use these tools to catch up with other professional translators. As a scholar, we use different technological devices in our daily life tasks of

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translation. It seems that we will leave the hard copies of books and dictionaries. In fact, articles, documents, scientific journals, and newspapers are no longer published in print but are only delivered digitally. This prompts the usage of CAT, because it is easier to copy and paste the text from SL into TL while translating.

What are the general factors affecting the implementation of CAT in translation?

Implementing CAT in the process of translation is vitally important. However, the success of CAT is affected by a number of factors. These factors can be classified into the following categories: human, technical, economic and cultural factors.

Human factors

Some translators resist using CAT tools because of several reasons. Some human translators lack the technical competence in using these tools leads to resistance in using them. Moreover, negative perception of CAT tools and their effectiveness in translation discourage translators to use them in their jobs. Some translators think that CAT kills the feature of creativity of translators.

Technical factors

The success or failure of integrating CAT tools in translation also depends on technical issues. Translators who tend to use CAT tools may face some difficulties when they use them. One of these difficulties is the lack of good tools that produce accurate translation from SL to TL. Up to date, no tool can translate exactly what is meant in the SL. The translation output of these tools may create misleading translation texts. An example of this issue is shown in Figure 1. In this example the word “secretariat” is not suitable. The exact word is “trustworthy”. The Arabic word أمانة can be translated in many ways. The context will determine the exact translation. But Google Translate cannot decide which one is an appropriate translation.



Figure 1: A snapshot from Google Translate

Economic factors

Implementing CAT tools in translation is not an easy task. Many factors will affect negatively to use them. Some of these are economic factors. The major problem is that most of these tools are not free. Translators should purchase them and some of them are not affordable by translators, especially in low-income countries. For example, the price of *MemoQ* translation tool is 770 USD per year. In addition, in some countries, especially the third world countries, lack of internet connection and electricity frequent shutdown hinder the translators to use CAT tools in their profession.

Cultural factors

Translation is a process that is devoted to culture. Translators need to be careful about cultural affairs when they translate. They should select the appropriate terms that suit the culture of TL. In contrast, CAT tools may translate terms of SL into TL which can be considered offensive or culturally not acceptable. This is due to difference between SL and TL. For example, *Sahoor* (سحور) the meal that is taken before dawn during (رمضان) Ramadan (month of fasting).

Figure 2. shows how Google translate could not translate both *Suhoor* and *Ramadan*



Figure 2: A snapshot from Google Translate

Linguistics factors

The linguistics factor exerts a crucial influence on the process of translation. At the phonological level the equivalences are sometimes unavailable in the TL, this creates problem for translators. Sometimes there are equivalences but the way of segmenting them in to sentences is a challenging enough for translators. These factors need to be fully examined and suggest solutions to their problems. For instane the gap between Arabic and English in this respect, the researcher just examined only the error that occurs in translating the word (mixed مشکل) in CAT Applications it is translated as problem while the correct translation is mixed.

What are the major translation theories and approaches that can be used as a framework for translation studies?

There are several theories that can be used as a framework for translation. Translation theories aim to give the translators a clear path and insights them to compromise between thoughts, meanings, and language structure. The most prominent and recent theories are introduced briefly in this section. It is obvious from different studies that process of translation occurs mostly at the semantic level. Newmark (1988) states that that translation theory derives from comparative linguistics, and within linguistics, it is mainly an aspect of semantics.

Semantic and Communicative Translation

Semantic and communicative translation theory was proposed by (Newmark, 1988, p. 22). He states that only two methods of translation are appropriate to any text: (a) *communicative* translation, where the translator attempts, to produce the same effect on the target readers as was produced by the original on the source language readers, and (b) *semantic* translation, where the translator attempts, within the bare syntactic and semantic constraints of the TL, to produce the precise contextual meaning of the author.

Functionalism and the Cultural Turn

The previous theory paid attention to the linguistic level, but it is vitally important to take into consideration the culture difference between TL and Sl. In 1980, there was a rejection of theories based on linguistic equivalence in favor of emphases on non-linguistic matters and cross-cultural interaction. Nowadays, translation takes into its consideration a communicative, socio-cultural context. This requires that translator must

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be fully familiar with the culture of the TL. This new development in the trends of translation theories can be summarized in the following statement by Gentzler as cited by (Cheung, 2013, p.8):

The two most important shifts in theoretical developments in translation theory over the past two decades have been (1) the shift from source-text oriented theories to target-text oriented theories and (2) the shift to include cultural factors as well as linguistic elements in the translation training models. Those advocating functionalist approaches have been pioneers in both areas.

Skopos Theory

Skopos is the Greek word that means 'aim or purpose' this theory was introduced in the 1970s by Hans J. Vermeer as a technical term for the purpose of a translation and of the action of translating. The major work on skopos is to establish a solid ground for translation. Skopos theory focuses on the purpose of the translation, which determines the translation methods and strategies that are to be employed in order to produce a functionally adequate result.

Some critics criticized Skopos theory, (Hatim, 2001, p.80) listed some criticisms of some scholars:

- 1- What purports to be a general theory is, in fact, is only valid for non-literary texts. Literary texts are considered either to have no specific purpose and/or to be far more complex stylistically.
- 2- Skopos theory does not pay sufficient attention to the linguistic nature of the ST nor to the reproduction of microlevel features in the TT.

Skopos theory and functional translation theories were the most famous theories affecting translation studies. Unfortunately, they did not make consideration for the new technologies. Williams, as cited by Balkul (2016), noted that technological factors were not fully integrated into mainstream translation theories, which have so far failed to acknowledge an epistemic influence of technology'.

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MT systems were based on old methods till the rise of functional translation theories which provided translators with fuzzy and exact matches from already translated text units but still failed to suggest contextually-meaningful and coherent sentences. Nowadays many CATTs use this method (fuzzy match) such as SDLTrados.

Polysystems Theory

As being mentioned that skopos is not valid for literary translation, Polysystems theory was primarily concerned with literary translation. Polysystems theory was developed in the 1970s by the Israeli scholar Itamar Even-Zohar. He believed that a literary cannot be isolated but as part of a literary system. Polysystems theory is considered as a mixed, hierarchized conglomerate of systems which interact to bring about an ongoing, dynamic process of evolution within the polysystems as a whole.

There are many approaches in the field of computer-assisted translation. The researcher focuses on the following four approaches because they are related to CAT. These approaches are: rule-based translation approach, transfer-based approach, the corpus-based translation approach, and hybrid machine translation.

Rule-based Translation Approach

The earliest approach to MT was ruled-based translation approach. It is called “classical approach of MT. It is based on the linguistic information. It was developed in the early 1970s. Translation in this approach takes place through the analysis- transfer- generation. This approach is based on a set of rules developed by language experts and programmers. These individuals reference dictionaries, general grammar rules, and semantic patterns of both languages to create a library of translation rules (software) that when run, deliver the appropriate translations of the source content in the desired target language. Rule-based translation can be divided into the following types: Interlingua approach, transfer-based approach and direct translation approach.

- a) Interlingua approach means that the SL text is changed into abstract form. This form includes all basic syntactic and semantic information, which are transferred to several TL texts. In other words, the term Interlingua stands for all sentences with the same meaning without

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reference to language. Best example the Esperanto language. The Interlingua approach can be called “language-independent approach.” It serves as the medium between natural languages.

b) The transfer approach consists of three stages. Firstly, analysis stage transforms an SL text into an abstract, can be called "codes" SL text representation. Consequently, the convert of SL representation into its equivalent TL representation takes places and finally the TL text is produced.

c) The direct translation is considered to be the first approach that is used in machine translation systems. In addition, it is regarded as the first generation of MT systems. This kind of approach is basically a dictionary-based system, which matches a word from SL to its TL equivalent. The translation is carried out in a direct way from SL to TL.

Transfer-based Approach:

This approach is based on translating text from SL to TL using the following steps:

- 1- Analyzing the parser and the source grammar to analyze the input,
- 2- Transferring the underlying representation of the SL sentence into the representation of the TL sentence and
- 3- Synthesizing the underlying representation of the TL sentence into the TL sentence using a generator and target language grammar.

The Corpus-based Translation approach

The corpus-based translation is also called ‘reference translation’, which contains texts and their translation in TL. The SL and TL are joined, and their equivalent translation is obtained by an extraction based on statistical models. The corpus refers to electronically stores texts in one language or in more languages. It can be divided into two different methods: the statistical method and the example-based method.

- 1- The statistical method concentrates on bilingual text corpora and on statistical models. The sentence from SL can have various translations.
- 2- The example-based method needs for its function a bilingual corpus. The examples are retrieved and fuzzy chosen from pairs of sentences. If there are no close matches in the bilingual corpus, the example-

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based method will fail to select the suitable pair and the outcome will be of low quality.

Hybrid Machine Translation Approach

In recent years, a lot of researchers aimed at integrating linguistic information into statistical machine translation systems. Hybrid machine translation approach is characterized by the use of various machine translation approaches within a single machine translation system. The reasons for developing hybrid machine translation systems stems from the failure of any single technique to achieve a satisfactory level of accuracy. Most of HMT approach systems use the combinations of the statistical and rule-based translation system. PROMT and SYSTRAN are examples of HMT systems

What are the limitations of CAT in comparison to human translation?

Nowadays, CAT tools are in their initial stages, and there are numerous problems that need professional (human) translator to solve. By identifying these limitations, human translators can cope with these limitations and get the highest benefit of these tools. First, many words are frequently invented and used in languages, so CAT tools must be updated accordingly. Second, translating words and simple sentences is somewhat an easy task. However, translating complex sentences, especially those include cultural, religious, and technical terms is challenging task and creates several mistakes. Third, CAT tools cannot deal with polysemy. Fourth, CAT tools cannot translate expressions with unique use and jargons as intended by the writers. For example, the expression “crusade war” in Muslim countries is considered as aggressive war, but for the western writer it is considered as a holy war against Muslim. Fifth, CAT tools cannot avoid taboo words, while human translators can use specific terms, euphemism, using antonyms, and so on. Sixth, CAT tools cannot produce distinct types of translation to suit the levels of the readers. Finally, CAT tools translate every text according to the data and the method that the application follows. In this case, not all texts must be translated in the same way. For instance, religious texts must be translated according to a specific reference.

What is the impact of CAT on human translators?

It is a controversial issue that whether CAT has turned human translators into just editors. Human translators, especially those who use

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traditional ways of translation think that CATTs will make them less important or replace them. The fear of this has led to a certain rejection of modern technologies by translators. Some translators reject to utilize CAT, thinking that these tools will harm their jobs. They define translation as an art which works with creation and imagination. Computers will not replace human translators. Human translators will be on demand because whatever CATTs improve, the need for the human translator is still existing. Some human translators have such negative attitudes towards using these tools; they think that these tools hinder the art of translation.

Conclusions

Dealing with CATTs, which is considered a subfield of artificial intelligence. Languages are highly complex, many words have various meanings and different possible translations, sentences might have various readings, idioms, cultural terms and the relationships between linguistic entities are often vague. In addition, it is sometimes necessary to take world knowledge into account. Different cultures and different connotations need to be considered while using CAT tools. Different approaches are used in CAT. This paper reviewed these approaches and their associated challenges. This paper showed that there is no perfect approach, though the problems associated with some of the approaches are very minimal. Combining some of the best features of some approaches to form a hybrid approach helps in coming over of the challenges posed by many approaches.

From the previous studies, it can be stated that most of CATTs failed in the respect of lexico-semantics level. CATTs can be adequate with cognate languages. But when translating language with different structure CATTs must be used carefully.

Human translators have to train themselves to deal with CATTs in proper ways. There are such defects, but a human translator can amend these defects.

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