

Translation and Modern Technologies: An Appraisal of Some Machine Translation

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Abstract

In the 21st century and in this challenging world, Technology is not an option but a necessity. Computers are used in many aspects of modern translation particularly for technical texts. Translation technology is a new field of interdisciplinary study lying between Computer-Based Program and Translation. The task is carried out with the aid of a Computer Aided Translation (CAT) and Terminology Management Tools (TMT): document creation, terminology data based and telecommunications which involves Internet, web browser and E-mail. This paper therefore, examines a variety of Computer web-based applications and software specially designed for translation tools for translators with special reference to Trados and Systran. Special emphasis is on the importance of Modern Technology in translation using Machine Translation (MT). Thus, the article concludes that it is important in present day time to involve MT in translation.

Key words: Translation Technology, Machine Translation (MT), Computer Aided Translation (CAT), Translation Memory (TM) and Modern Technology.

Introduction

Technology is more than human efforts or capabilities. It is a tool that is needed to achieve something. It is the state of humanity's knowledge of how to combine resources to produce desired results, to solve problems, fulfill needs, or satisfy wants. It includes technical methods, skills, processes, techniques, tools and raw materials. When combined with another technology it refers to high technology (high-tech) available to humanity in any field of human endeavor (Alcina, 2008).

Previously, when we had to figure out meaning of a word from another language, we use dictionary. Not only was this, a time consuming task, but it was also elusive. Moreover, when an entire paragraph had to be translated, it could be very difficult because one word may have more than one meaning. In this case, what do we do? That is where machine translation comes into effect. The Internet with its universal access to information and instant communication between users has created a physical and geographical freedom for translators that were unattainable in the past, (Olivia, 2004). Considering the period we are in now (the 21st century) or Information age, nothing is easily done without Information and Communication Technology or Information Technology (ICT/IT), (Zaki M. Z., 2015).

Machine Translation is automated translation, (www.systransoft.com). Machine Translation is basically the use of software programs which have been specifically designed to translate both verbal and written texts from one language to another, for example from French to English, (www.omniglot.com/language/articles/machine-translation).

Modern Technology

Technology is an activity that forms or changes culture. It is the collection of techniques, skills, methods and processes used in the production of goods and services or the accomplishment of objectives, such as scientific investigation, (Borgmann, 2006). Technology can be embedded in machines, computers, and other devices which can be operated by individuals without detailed knowledge of the outcome of such things, (www.en.wikipedia.org/wiki/technology). Bernard defines technology in two ways: as “the pursuit of life by means other than life”, as “organized inorganic matter”, (Bernard, 1998).

Technology today has made life easier and better in our society because it is less time consuming. Modern Technology which evolved over the years increases human capabilities to the extent that early technology is no longer appreciable. It must have gotten obsolete or got replaced by modern technology. It simplifies life in so many ways and everyone sees it in his own way, (www.useoftechnology.com/modern-technology).

Translation and Modern Technology

Technology extends human capacities. A monkey uses a stick to hit down a banana from its tree, and that stick is technology, in this case a simple tool. More general technologies are collections of tools, (Ramon, 2002). Some of these tools affect our communications, and thus translation. It can be the entities both material and immaterial created by the application of mental and physical efforts in order to achieve some targets. In this sense, technology refers to tools and machines that may be used to solve our problems. Tools and machines need not be material; virtual technology such as sophisticated software may be immaterial.¹

The intelligent use of machine translation should mean that our best human efforts are focused where they are most needed. However, technology is not perfect, and translators must be aware of those imperfections, (Ramon, 2002).

« La traduction met en contact intime et systématique deux langues différentes tant du point de vue strictement linguistique qu'en ce qui concerne les civilisations matérielles, les cultures et même les conceptions philosophiques des sociétés auxquelles elles répondent », (Ruzena, 1979). Translation puts systematic and in close contact with two different languages so much of the view point strictly linguistics which concerns civilizations, cultures and even philosophical conceptions of societies to which they respond, [my translation]. Translation must have contact with linguistic system of the source language (SL) as well as the target language (TL).

A text can go from one natural language to another with no changes other than those required by the target-language grammar. If, given two utterances, one in English and another in French, there exist between them a precise correspondence of structure and of significance, and the

¹Industry, Technology and Global Marketplace: International patenting Trends in two Technology Areas “Science and Engineering” indicators, 2002.

equivalence is achieved monème by monème, literal translation results and can be applied without risk.

Translation is the art of converting a text or information from one language to another without changing or tempering with the message, while interpretation is the act of explaining the obscured message written and orally from one natural language to another. Translation can be done instantly by saying or writing or could take time depending on the text.

Translation becomes very important in terms of the interaction between two individuals or countries that do not have same natural language. These two countries that come together but with different cultures, languages, regions or geographical locations and of diverse ethnic groups must have a medium of communication (which could be French for instance) as a tool or medium to unite them and which is language.

Vinay and Darbelnet see translation as ... *comparer, ... confronter deux systèmes linguistiques non seulement deux lexiques, deux syntaxes, deux structures mais aussi deux génies et deux conceptions de la vie*, (Vinay, 1977). Translation is ... comparing,... confronting two linguistic systems not only two lexis, two systems, two structures but also two conceptions of life,[my translation].

From the going, we can say that the relation between more than two individuals or countries that are not having same language of communication and culture must use translation and/or interpretation. French Language serves as a tool of communication between Nigeria and France for example. This is done in maintaining contact with other specialists of the language in and outside the two countries to promote the recurrence of using Modern Technology. This can be done by exploiting the recent development of Computer-Aided Translation (CAT) and the terminology to resolve linguistic variation, (Olivia, 2004). There is a signed Memorandum of Understanding (MOU) between President of France and that of Nigeria since 1996. The agreement helps in bridging the relationship between citizens of the two countries with a view to promoting education, technology, culture and language.

Machine Translation and Translation Software

The first serious attempts to create Machine Translation systems date back to 1940s, when United States and the USSR both funded projects to move rocket technology out of Germany, and then to spy on each other, (Ramon, 2002).

Machine Translation (MT) and Computer-Aided (assisted) Translation (CAT) are two different technologies and the consequence of different approaches is that they do not produce the same results and are used in different situations, (Olivia, 2004). Machine Translation is a sub-field of computational linguistics that processes the use of software to translate text or speech from one natural language to another. It performs simple substitution of words in one language for words in another, but that alone may not produce a good translation of text or information because recognition of whole phrases and their closest counterparts in the Target Language (TL) is needed like in translation of proverbs and idioms (Olivia, 2004). While Computer Aided Translation is a complex process involving specific tools and technology adaptable to the needs of the translator, who is involved in the whole process and not just in the editing stage. The

computer becomes a workstation where the translator has access to a variety of texts, tools² and programs. Each translator can create a personal work environment and transform it in accordance with the needs of the specific task.

MT aims at gathering all the information necessary for translation in one program (software) so that a Source Text can be translated to Target Text without human intervention. It exploits the computer's capacity to calculate in order to analyze the structure of a statement or sentence in the Source Language (SL), breaks it down into easily translatable elements and then creates a statement with the same structure in the Target Language. It uses huge plurilingual dictionaries, as well as corpora³ of texts that have already been translated, (Olivia, 2004).

Software refers to a set of Computer programs, procedures and associated documents describing the programs and how they are to be used, (Pradeep, 2007). He added that this kind of translation has limit. Translations are built on voluminous dictionaries and sophisticated linguistic rules.

Special reference is given to the following software of translation at a glance thus:

Trados Software is an editor of specialized software in software of Computer Aided Translation (CAT). It is the principal suite of Computer Aided Translation of the society of SDL Trados. It is the complete translation environment for corporate language professional who wants to edit, review and manage translation projects as well as organize corporate terminology (www.sdl.com/.../sdl-trados 2015).

Trados is a software originally developed by German company, Trados GmbH and currently available from SDL plc. a provider of customer experience cloud solutions. It is considered the market leader in providing translation software solutions across the entire translation supply chain including freelance translators, language service providers, corporate language departments and academic institutions, (Kockaert, 2015).

The powerful Translation Memory (TM) technology is meant to reuse previously translated and approved content across all of your tasks with intelligent TM technology. It increases consistency across content areas. (www.sdl.com/exc/language/...).

Systran stands for System Translation. It is an acronym made up of two syllables to form a word, **Sys** for System and **Tran** for translation. Systran is an automatic translation software products designed for personal, business and enterprise use. The software automatically translates text from one natural language into another, (Olivia, 2004). It can be used to translate some languages as source language (SL) or target language (TL): English, French, German, Spanish, Italian ... It saves time and reduces translation costs. It is incredibly useful and lets you understand foreign language information like any web page, document or E-mail in the language of your choice in real time, (www.systranoft.com/ip/machine-translation/...).

“Translation helps in bringing to the speaker or reader of one language, those things that one can see on paper, those ideas scripted in books, those projections, those strategies that can make a nation develop, but are hidden from one, because one cannot read or comprehend the language they are written in”, (Yakasai, 2004). Systran is fast,

²Electronic monolingual and bilingual dictionaries, glossaries, parallel texts, translated texts in a variety of source and target languages, and terminology databases.

³ A collection of writings often on a specific topic.

useful and reliable. It is a web-application, (www.systran.fr 2014). Systran has two types of software technology in translation as:

Rule - Based Machine Translation

It relies on countless built-in linguistic rules and millions of bilingual dictionaries for each language pair. The software parses text and creates a transitional representation from which the text in the target language is generated. This process requires extensive lexicons with morphological, syntactic and semantic information and large set of rules, (Olivia, 2004). The software uses these complex rules set and then transfers the grammatical structures of the source language into the target language.

It has consistent and predictable quality, it has out-of-domain translation quality, it knows grammatical rules and it has high performance and robustness. The software has consistency between versions but has lack of fluency. It is hard to handle exception to rules and has high development and customization costs.

Statistical Machine Translation (SMT) Technology

It utilizes statistical translation model whose parameters stem from the analysis of monolingual and bilingual corpora. It builds statistical translation models in quick process, but the technology relies heavily on existing multilingual corpora. It has a minimum of 2,000,000 (2 million) words for a specific domain even though more are required for general language, (Olivia, 2004). It is CPU intensive and requires an extensive hardware configuration to run translation models for average performance levels.

It has unpredictable translation quality, it has poor out-of-domain quality and does not have grammar. It has a high Central Processing Unit (CPU) and disc space requirement, SMT has inconsistency between versions, and has good fluency and good for catching exceptions to rules.

Machine Translation Strategies

Machine translation uses autonomous Operating System (OS) with strategies and approaches that can be classified as follows:

- **The Direct Strategy:** This involves a minimum of linguistic theory. This approach is based on a predefined source language (SL) - target language (TL) binomial in which each word of the source language syntagm is directly linked to a corresponding unit in the target language with a unidirectional correlation, (Olivia, 2004). This is based on a direct approach with a strong lexical component. The mechanisms for morphological analysis are highly developed. The dictionaries are extremely complex but the processes of syntactical analysis and are limited to disambiguation.
- **The Transfer Strategy:** This focuses on the concept of "level of representation" and involves three stages, (Olivia, 2004). The **analysis stage** which describes the source document linguistically and uses a source language dictionary. The **transfer stage** transforms the results of the analysis stage and establishes the linguistic and structural equivalents between the two languages. It uses a bilingual dictionary from source

language (SL) to target language (TL). The **generation stage** produces a document in the target language on the basis of the linguistic data of the source language by means of a target language dictionary.

- **The Pivot Language Strategy:** This is based on the idea of creating a representation of the text independent of any particular language. This representation functions as a neutral, universal central axis that is distinct from both the source language (SL) and the target language (TL). This method reduces the machine translation process to only two stages: analysis and generation, (Olivia, 2004). The analysis of the source text leads to a conceptual representation, the diverse components of which are matched with the generation module to their equivalents in the target language (TL). The research on this strategy is related to artificial intelligence, (Russell, 1995), (AI)⁴ and the representation of knowledge.

Advantages and disadvantages of Machine Translation

In the face of rapid globalization, such services have become invaluable for people and one has negligible disadvantages of Machine Translation.

The advantages are:

- ✓ In terms of crucial time factor, Machine Translation saves the day. You do not have to spend hours going through dictionary to translate words; instead, a software can translate the content quickly and provide a quality output to the user within a limited time.
- ✓ It is comparatively cheaper. It might look like unnecessary investment but at long run, it is less expensive considering the return it provides. This is because if we use expertise of a professional translator, he charges on a per page basis which is going to be extremely costly.
- ✓ A machine translator usually translates texts which is in many languages. So, there is no such concern, while a professional translator specializes in one particular language only.
- ✓ Confidentiality is another matter which makes Machine Translation favorable. Giving out sensitive document or data to a translator might be risky while with Machine Translation the information is safer, (Zaki, 2016).

The disadvantages are:

- ✓ Competency. Technology increased dependency on modern tools like computers that have reduced us of our creativity. This affects the way we use our brains or thoughts and reduces our level of creativity.

⁴Artificial Intelligence (AI) is the study and engineering of intelligent machines capable of performing the same kinds of functions that characterize human thought. When it comes to language and speech recognition, their translations are imperfect, although good enough to be understood, and their dictation is reliable only if the vocabulary is predictable and the speech unusually clear. The logic of language structure (syntax) submits to programming, the problem of meaning (semantics) lies far deeper in the direction of true AI. Natural-language development capabilities in AI systems is an important focus of AI. It involves programming computers to understand written or spoken information and to produce summaries, answer specific questions, or redistribute information to users interested in specific areas. Essential to such programs is the ability of the system to generate grammatically correct sentences and to establish linkages between words, ideas, and associations with other ideas.

- ✓ Systematic and formal rules are followed by Machine Translation so it cannot concentrate on a context and solve ambiguity and neither makes use of experience nor mental outlook like a human translator does.
- ✓ Accuracy is not offered by Machine Translation on a consistent basis. You can get the draft or document but Machine Translation only gives word for word translation without comprehending the information which might have to be corrected manually later on, (O'Sullivan, 1990).

Realization and challenges of Machine Translation

Before now, translators were those that are fully in charge of translating texts or information from one language to another for many companies, institutions and even international organizations. But, presently there are plentiful software available, sophisticated in terms of translation as application software installed in systems or available on-line that aid in translating or translate texts (Ramon, 2002) or information from one language to another.

Translation is not possible without human intervention. It is important to understand that the functioning of the human brain (cognitive processes) in translation is quite essential. The first stage in human translation is full comprehension of the source language text. This comprehension operates on several levels: semantic level: understanding words out of context, as in a dictionary, syntactic level: in understanding words in a sentence and pragmatic level: which discloses understanding words in situations and context.

Furthermore, there are at least five types of knowledge used in the translation process:

i). Knowledge of the source language (SL), which allows us to understand the original text. ii). Knowledge of the target language (TL), which makes it possible to produce a coherent text in that language. iii). Knowledge of equivalents between the source and target languages. iv). Knowledge of the subject field as well as general knowledge, both of which aid comprehension of the source language text. And finally v). Knowledge of socio-cultural aspects of the customs and conventions of the source and target cultures.

Having identified the complexity of the situation that underlie the work of a human translator, it is inconceivable to claim that a machine could produce a target text of the same quality as that of a human being. However, it is obvious that even a human translator is capable of producing an elegant translation.

In actual sense, the translation process comprises two stages: 1. The production of a rough text (draft) or preliminary version in the target language (TL), in which most of the translation problems are solved but far from being perfect; 2. The revision stage, varying from merely re-reading the text while making minor adjustments to the implementation of thoroughgoing changes.

It is therefore said that MT aims at performing the first stage of this process in an automatic way, so that the human translator can then proceed directly to the second, carrying out the demand task of revision. The problem is that the translator now faces a text that has not been translated by a human brain but by a machine, (Olivia, 2004). It changes the required approach because the

errors are different. It becomes necessary to harmonize the machine version with human thought processes, judgements and experiences.

Machine Translation is an aid and a *piege*(trap) for translators. It is an aid because it completes the first stage of translation. It is a *piege* because it is not always easy for the translator to keep the necessary critical distance from a text and in a translated form the mistakes may go undetected. There is no way a translation produced automatically be considered final, even if it appears on the surface to be coherent and correct.

Conclusion

Technology is not an option in today's professional world; it is a necessity. Computer-Aided Translation (CAT) seems to be redundant because all translations are aided by computers. The most revolutionary tools are quite probably the everyday ones that are not specific to translation: Internet search engines, spell checkers, search and replace functions, and revision tools have had a huge impact on all forms of written communication.

On countless stages, the advantages presented by technology are so great that they cannot be ignored. Translation performs the most repetitive tasks so that translators can concentrate on the most creative aspects of translation. The intelligent use of machine translation should mean that our best human efforts are centered where they are needed most. However, technology is not perfect, and translators must be aware of those imperfections. MT can be weighed and the right decision be made depending on the information and the quality that is required.

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Full meaning of Abbreviations used in the work

- MT – Machine Translation
- HT – Human Translation
- HDD – Hard Disc Drive
- TM – Translation Memory
- CAT – Computer Aided (assisted) Translation
- TL – Target Language
- SL – Source Language
- IT – Information Technology
- ICT – Information and Communication Technology
- ASR – Automatic Speech Recognition
- DNN – Deep Neural Network
- AI – Artificial Intelligence

- API - Application Programme Interface
- TLG - Target Language Grammar
- TGG - Transformative Generative Grammar