

People's Democratic Republic of Algeria  
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Kasdi Merbah Ouargla University  
Faculty of Letters and Languages  
Department of Letters and English Language



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## **Exploring Machine Translation**

### **A Comparison between Machine (google) and Human Translation of Literary and Technical Texts**

Presented and publicly defended by

**HABA EI Mahdi & OUSTANI Touria**

Supervised by

**Mrs. MESLOUB Dalila**

Jury

Members of The Jury	Mrs. SAADOUNE Farida	Chairperson
Members of The Jury	Mrs. MESLOUB Dalila	Supervisor
Members of The Jury	Mr. ZEGHAR Hemza	Examiner

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**Exploring Machine Translation; Case Study: A Comparison between Machine (google)  
and Human Translation of Literary and Technical Texts**

Haba El Mahdi

Oustani Touria

Department of Literature and English Language, Kasdi Merbah University, Ouargla

Translation Arabic/English

Mrs. Mesloub Dalila January 9, 2022

### **Dedication**

I dedicate this dissertation especially to the person who stood by my side and constantly supported me through all walks of life, the person that gave me endless love and support; my dear mother to whom I am forever grateful. This work is also dedicated to my dear father, my siblings, my dog Laika who departed this life few months ago, taking a part of my heart with her, and whose memory I shall never forget. I dedicate this paper as well to my younger self, an agreeably pleasing little girl with her big dreams, a girl who has always been inside of me, invisibly taking it upon herself to push me whenever things get tough.

**Touria**

### **Dedication**

I dedicate my dissertation to my loving parents who made me the person I am today, and whose prayers, love and care helped me a lot to get through life's challenges. My utmost gratitude goes to my siblings who supported me all the time as well. I also dedicate this paper to the rest of my family, friends and everyone whoever been there for me. I would not have done it without you.

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**Thank you all**

### المخلص

منذ تقديمها لأول مرة في ثلاثينيات القرن العشرين، تم الإشادة بالترجمة الآلية وانتقادها في آن واحد، لكن الوقت الحاضر كان ولا يزال شاهداً على تحسن و تطور الترجمة الآلية بشكل كبير، وذلك بفضل التطورات التكنولوجية حيث أنها أضحت أداة مهمة في أيدي المترجمين المختصين و للناس عامة، ولكن هذا لا يعني خلوّ الترجمة الآلية من العيوب و النقائص. وعليه فإن هذه الرسالة تحاول التحقيق في مسألة نجاح الترجمة الآلية بالمقارنة مع ترجمة الإنسان من خلال المقارنة بين هذان النوعان من الترجمة في نصوص أدبية وتقنية مختارة. كما تلقي هذه الرسالة الضوء على الأخطاء اللغوية والدلالية التي قد تحدث أثناء استخدام الترجمة الآلية في ترجمة أنواع نصية معينة تلتزم وتستوجب استخدام لغة خاصة متخصصة ضمن إطار لغوي معين.

**العبارات المفتاحية:** الترجمة الآلية، الترجمة البشرية، الترجمة الأدبية، الترجمة التقنية، النصوص الأدبية، النصوص التقنية.

### Abstract

Since its first introduction in the 1930's, machine translation was both praised and criticized. Nowadays, MT has been improved significantly, thanks to the technological developments, and became an important tool in the hands of human translators and for people in general, though not without its deficiencies and drawbacks. This dissertation attempts to investigate the issue of success of machine translation as opposed to human translation through a comparison between the two types of translation in selected literary and technical texts. It also sheds light on the linguistic and semantic errors that may occur while using MT in translating certain text types of specialized language.

**Key Terms:** Machine Translation, Human Translation, Literary Translation, Technical Translation, Literary Texts, Technical Texts.

### Résumé

Depuis sa première introduction dans les années 1930, la traduction automatique a été à la fois louée et critiquée. De nos jours, la traduction automatique s'est considérablement améliorée, grâce aux développements technologiques, et est devenue un outil important entre les mains des traducteurs humains et pour les gens en général, mais non sans ses lacunes et ses inconvénients. Cette thèse tente d'étudier la question du succès de la traduction automatique par opposition à la traduction humaine à travers une comparaison entre les deux types de traduction dans des textes littéraires et techniques sélectionnés. Il met également en lumière les erreurs linguistiques et sémantiques qui peuvent survenir lors de l'utilisation de la traduction automatique dans la traduction de certains types de texte de langage spécialisé.

**Termes/Mots Clé:** Traduction Automatique, Traduction Humaine, Traduction Littéraire, Traduction Technique, Texte Technique, Texte Littéraire.

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### List of Abbreviations

<b>ST</b>	Source Text
<b>TT</b>	Target Text
<b>MT</b>	Machine Translation
<b>HT</b>	Human Translation
<b>TM</b>	Translation Memory
<b>e.g.,</b>	For example,
<b>LSP</b>	Language for Specific Purposes
<b>et al.</b>	and others

## **General Introduction**

Machine translation is a profession which saw the light many centuries ago, especially, thanks to the American researcher and mathematician Warren Weaver (1949-1950s). It is largely performed today, and it is still in high demand due to the constant technological progress and the need to render the new terminology that come along (with it).

We constantly observe the addition of new terms to English dictionary in particular, English, being the language of technology and science. This ongoing terminology revolution placed professional translators under pressure and made it challenging for them to cope with its pace in the process of translating different documents including scientific and technical documentation, newspaper reports, legal translation, publicity leaflets, etc.

Henceforth, human translators resorted to machine translation for further assistance. However, this assistance did not come without its deficiencies, because MT is not as perfect and/or effective as it may seem.

## **Statement of the Problem**

At the present time, the demand for Machine Translation has significantly increased because of people's desire to transfer their texts interchangeably among languages. Accordingly, people started to rely more on MT's systems rather than human translators without realizing to what extent they may be accurate. Despite the many pros of Machine Translation, its cons can represent a serious challenge and can become a source of chaos when they result in inaccurate rendition.

### **Aim of the Study**

- 1) Examining the accuracy of MT in different types of texts and/or documents.
- 2) Comparing human and machine translations.
- 3) Identifying and explaining the pros and cons of Machine Translation, with a special focus on the cons.
- 4) Comparing Machine Translation and Translation Memory.
- 5) Giving readers a detailed study on Machine Translation from our point of view.
- 6) We expect learners at the end of the paper to be able to differentiate between MT, TM, and HT.

### **Methodology**

The study adopts a descriptive qualitative research design. Data is collected from different research area, including books, articles, dissertations which are relevant to our research.

### **Research Questions**

This study will be conducted to answer the following questions:

#### **Main Question**

To what extent can Machine Translation reach the accuracy of Human Translation?

#### **Sub-Questions**

1. What are the limitations of MT in translating literary and technical texts?
2. To what extent may machine and human translations vary at the grammatical, syntactic and semantic levels of language in the literary and technical texts?

### **Hypotheses**

1. Literalness and lack of accuracy can be the main limitations of MT.
2. The degree of variation between MT and HT may differ from one type of text to another.

### **Research Significance**

- 1- This paper is intended to highlight the limitations imposed by the uninvolvement of a human mind with the MT.
- 2- It sees Machine Translation in a different light; not from a scientific standpoint but through the eyes of translation learners.
- 3- With the latest technology, MT has evolved significantly, that Google Translation seems useless in a way, given the provided types of TM that proved their utter effectiveness.

### **Structure of the Study**

The dissertation is divided into two parts. A theoretical part and a practical one. In the theoretical part, the first chapter covers a generic background to machine translation, and the second chapter deals with the issue of translating literary and technical texts. The practical part investigates the pros and cons of MT in selected technical and literary texts. Also, it tries

to compare the MT with HT in the same selected texts and then discusses the findings.

### **Literature Review**

Several scholars and researchers have discussed machine translation in their books and articles from the previous time to the current one. “An Introduction to Machine Translation” by Hutchins and Somers (1992) was the first textbook in machine translation, in which the authors provided an adequate study on the characteristics of general machine translation systems.

Moreover, Arnold et al. (1994), in a book entitled “Machine Translation: An Introductory Guide”, presented a further explanation that covers all aspects of machine translation, ranging from the use of modern machine translation systems to their evaluation and development in the near future. Unlike the previous studies, Melby and Warner (1995), in their book “The Possibility of Language: A Discussion of the Nature of Language, with Implications for Human and Machine Translation”, discussed the limits of machine translation and explored the claim about its accuracy on domain-language texts more than on general-language texts. Calude (2003), in her article entitled “Machine Translation of Various Text Genres”, tackled the issue of machine translation success for different text types.

Furthermore, in Denkowski's (2015) doctoral dissertation entitled “Machine Translation for Human Translators”, the researcher presented extended features to the components of statistical machine translation systems that aimed to reduce the work effort of the human translator. Bouhadiba (2016), in her master dissertation entitled “The Deficiencies of Machine Translation of Proverbs and Poetry: Google and Systran Translations As a Case Study”, highlighted the stylistic, syntactic and semantic errors of machine translation of

Proverbs as well as the cultural misrepresentation of poetic machine translation. Bennoaman (2021) in an article entitled “Perspectives on Machine Translation of Popular Scientific Texts: Al Misbar Website As a Model” explained the role that machine translation of scientific texts can play in enlightenment and dissemination of knowledge. She also identified the problems of Arab machine translation systems in translating this type of texts.



# **Theoretical Part**

# **Chapter 1**

## **Background to the Study**

Machine translation (MT) is considered as a fundamental aiding tool in translation since people are increasingly using technology for diverse purposes nowadays. Therefore, in this chapter, we start with the definition of the concept “machine translation”. Next, we provide a brief history of machine translation and its developments over the years, as well as, its three various types. Then, we spot the light on the differences between machine translation and translation memory and between machine translation and human translation. Lastly, we identify the aims of machine translation.

### **1.1 Definition of Machine Translation**

Before we start defining machine translation, we attempt first to identify the concept of translation in general. The term translation is generally defined as interpreting the original text into an equivalent text of another language. Therefore, a simple definition was given by Yamin (2014), “translation usually refers to the act of formulating the language of the source text (S.T) into the language of the target text (T.T) by taking into account both linguistic as well as cultural distinctions” (p. 146). It is vital for the translators to maintain the genuine meaning of any text when translating by understanding the content linguistically, semantically and culturally. However, with the increased development of technology, developed countries offered new means of translation known as Machine Translation.

Machine Translation (henceforth, MT), has been defined as “a sub-field of translation technology that investigates the use of computer software in translation from one language, the source language (SL) into the target language (TL)” (Chelghoum, 2016, p. 207). Another explanation can be added to this definition which is “MT is a computer program created to translate a text from one language into another without human integration” (Zagood, n.d, p. 2). Hutchins (1995), in his article entitled *Machine Translation: a brief history*, asserts that:

Machine translation (MT) refers to computerized systems responsible for the

production of translations with or without human assistance. It excludes computer-based translation tools which support translators by providing access to on-line dictionaries, remote terminology databanks, transmission and reception of texts, etc. (para 3).

This definition stresses the fact that MT tools are designed for the translators to facilitate for them the translation by providing an easy and instant access to on-line dictionaries and other useful elements.

Zughoul and Abu-Alshaar (2005) demonstrated that machine translation “is the presence of a computer system as an initiative for translation” (p. 3). This translation includes three types of directions: Unidirectional (translating only in one direction e.g. from English into Arabic), Bidirectional (translating in both directions e.g. from English into Arabic and from Arabic into English), Multidirectional (translating between more than two languages). Hence, machine translation is considered as a revolutionary type of translation, where the base text of any language can be interpreted automatically into an equivalent term of the same structure in another language and this is done by a computing device.

## **1.2 History and Development of Machine Translation**

Machine translation, known as MT, “is an important task that aims to translate natural sentences using computers” (Tan et al, 2020, p. 1). Machine translation is a revolutionary idea came to existence in the mid of 30’s to assist human translation. In 1947, this means was carried out by the Russian Peter Troyanskii and developed by the mathematician Warren Weaver and Andrew Booth (a British crystallography). These two scholars put forward two main tentative ideas: Booth developed the morphological analysis of the mechanical dictionary; however, Weaver proposed specific strategies to solve problems when using computers to translate natural language. These proposals based on statistics, information theory, knowledge of crystallography, logic and language universals (Hutchins, 1995). Thus,

this memorandum became widespread in the United States as well as around the world, and many investigators were interested in it (Trujillo, 1999).

Researches continued to make changes in the field of machine translation in the last few years, MT; therefore, has seen great improvement in computing and in formal linguistics, particularly, in syntax which in return resulted significant development in quality. Although the ideal goal of MT is to produce high quality of translation, Bar-Hillel through his research discovered that MT has seen semantic ambiguity and he illustrated this argument with the following sentence: “the box was in the pen”. This sentence contained two meanings: the first one is writing implement; whereas, the second is a container for animals or children. In human knowledge, the first meaning is obvious and acceptable unlike the second one which seemed to be excluded. Because of this ambiguity issue, Hillel claimed that this type of semantic problems is common and machine translation would be unable to detect this kind of issues without a vast encyclopedia (Hutchins, 1995).

Research did not complete, but instead, after Hillel’s argument, machine translation has seen considerable progress in its systems and many groups were put up outside United States and Europe due to the vigorous investigation on the MT. These researches were mainly focused on semantics and syntax (Hutchins, 1995).

In the 1960’s, a report was made by a group of scientists called “ALPAC”, the Automatic Language Processing Advisory Committee, which suggested that machine translation has seen low progress, expensive and less accurate; therefore, the government of United States was concerned and asked the ALPAC to examine the situation (Hutchins, 2007).

Late in the 1980’s and early 1990’s, there was a significant progress in the use of machine translation due to the powerful computers; where many companies began to market MT software for personal computers and workstations. This period has seen an emergence

work on the systems of speech translation and statistical approaches to MT (Trujillo, 1999).

In the 2000's, more innovations during this period were followed by powerful translation engines on PC (Personal Computer) and were followed also by providing network access to online translation. This development led to different software systems of MT in order to meet the needs of translation (Hutchins, 2007).

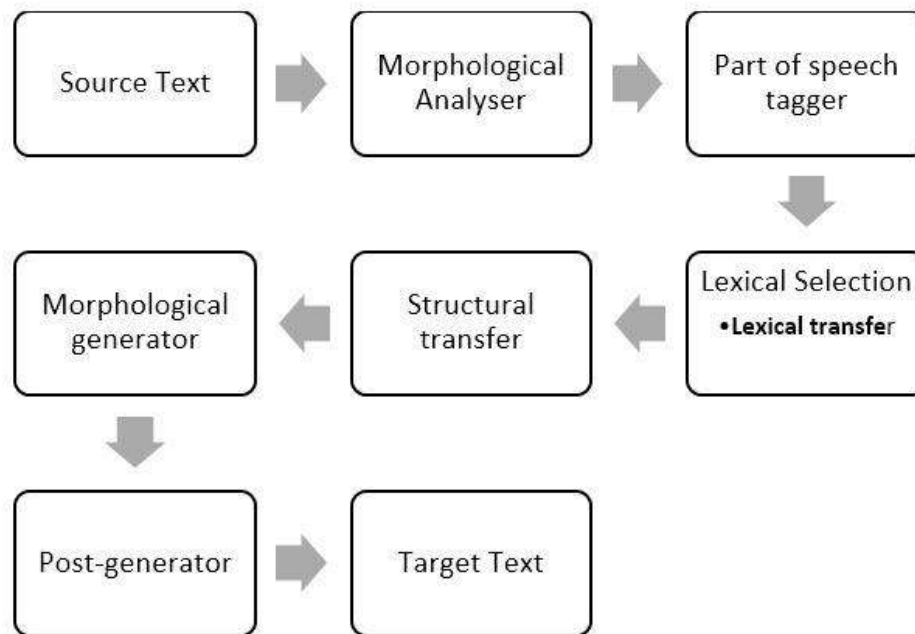
The field of machine translation has been the main focus of many researchers and this led to positive developments; however, this translation has still got very long way to go until it reaches perfection in the sense of accuracy and quality.

### **1.3 Types of Machine Translation Systems**

Machine translation systems have different types that can be classified into three categories: rule-based machine translation, statistical-based machine translation, and neural machine translation.

#### **1.3.1 Rule-based machine translation (RBMT)**

The Rule-based machine translation works on the morphology, syntax and semantic of both languages. So, we required the syntax analysis, semantic analysis of source text and to generate the text in the target language we need syntax generation and semantic generation (Irfan, 2017, p. 1).

**Figure 1***Rule-Based Machine Translation***1.3.2 Statistical machine translation**

Statistical machine translation or (SMT) for short “is an approach to MT that is characterized by the use of machine learning methods. A learning algorithm is applied to a large body of previously translated text, known as a parallel corpus, and then the learner is able to translate previously unseen sentences” (Esan, et al., 2016, p. 2).

**1.3.3 Neural machine translation**

Neural machine translation (NMT) is one of the machine translation types; it is based on the neural network techniques in order to solve problems concerning language translation. Tang, Yang, Chen, et al., defined neural machine translation as “a radical departure from previous machine translation approaches. NMT employs continuous representations instead of discrete symbolic representations in SMT. NMT uses a single large network to model the entire translation process, freeing the need of excessive feature engineering” (Tan et al, 2020,

p. 1).

#### **1.4 Translation Memory VS Machine Translation**

In his book, Trujillo (1999) mentioned that the paper which was published by Martin Kay in 1980 on the use of computers to help translation, was the first initiation of MT setting. Kay came up with the concept of translation's amanuensis or transcribing aid. This kind of aid is defined as a computer system in human hands. In other words, transcribing aids are meant to help humans in translating source texts. Gradually, these aids took other difficult tasks that can be automatically done, leaving humans to do more creative and challenging aspects of translation. The paper also suggested "the use of a text or word processor with features oriented to translation, as well as electronic dictionaries and retrieval software that allows translators to inspect fragments of texts similar to those being translated". Such tools are meant to enhance speed and quality of translation. The development of such ideas paved the way to the coinage of the term translator's workbench (TWB) or translator's workstation (p. 57).

Since the publication of Kay's paper, many TWB's have been proposed. According to Trujillo (1999), a TWB provides a bunch of electronic translation tools combined in one setting in order to facilitate man's entrance to them and to remain under his control. The tools that are linked to a specific TWB rely heavily on the type of translation that is meant for and its role within document production cycle.

Trujillo has defined Translation memory as follows:

Translation memory (TM) is a translation aid which efficiently searches a DB of previously translated text fragments known as translation units (TUs) in order to locate one which closely resembles the fragment being translated. Once found, its translation is offered as a draft translation which can then be modified as necessary by the translator. The DB of TUs is sometimes also referred to as the translation memory



of the system; the sense is usually clear from the context (Trujillo, 1999, p. 60).

Another definition which can be clearer and more understandable is that translation memory is a linguistic database where all translated passages are collected and reused when there are similarities in cases of translation in order to avoid retranslating them again. Translation memory makes the translation process much easier and faster to help people in having more projects done, thus have more revenues. Responsibles of translation memory use tools called CAT (Computer Aided Translation) which are more appropriate in translating documents of specialized terminology. Using these tools has many advantages, such as consistency, flexibility, speed and cost. However, when it comes to machine translation, it is less accurate due to the absence of the human aid, and to the fact that it cannot understand the loads of meaning or contexts within a given language. Consequently, both quality and accuracy are believed to be reduced by half, and it is inappropriate to submit the draft immediately to the customers (Excel Translations, n.d.). In other words, machine translation is an automatic process, it is fast but poor in quality and accuracy because humans are not included within the process of translation.

### **1.5 Machine Translation VS Human Translation**

The article that is written by Boukreris and Labed (2016) represented the main differences between MT and HT regarding linguistic and cultural differences. According to them, translation as a process is hard in reality. It requires a real and valuable linguistic, semantic and cultural understanding from the part of translators to the source text in order to convey the intended message into the target language. The history of translation is known for its five overlapping stages. Each stage came up with something new to the field of translation, and it was until the last stage that SL was first introduced into the machine, which was expected to be capable of providing a close, equivalent semantic text in TL.

The huge attempts done by researchers in the field of machine translation challenged

man's language by depending on a machine to do a human task. Zarechnak sees that the introduction of machines to source texts is for the sake of broadening computer's usage to the humanistic field, in addition to the "natural desire of mankind to extend its physical and intellectual organs artificially... the computer might free man from the mundane tasks and allow him to apply his creative power to the results produced by computers". According to Newmark, the use of computers in translation is like "filling up the gaps between languages" in case of facing some untranslatable terms or culture specific terms between two languages that need to be translated via TL words or phrases. For Bassnett, it is "bridge-building across the space between source and target", and this means that human's creativity and contribution in the translation process is irreplaceable (as cited in Boukreris and Labeled, 2016, p. 272).

For many scholars, equivalence is very important between SL and TL, and it is far from being achieved by a machine. No one can deny the fact that machine translation is a solution and an inevitable outcome of the world's huge demand of translation. However, this fact is challenged by doubting the reality of machine's capacity to translate from one language into another. Torrens supported this idea by stating that "human can translate; computers only appear to translate; they produce "pseudo-translations" (as cited in Boukreris and Labeled, 2016, p. 275).

As far as language is concerned, J.C. Sager highlighted that there is no parallelism between the two kinds of languages which are made by human and machine. The language produced by humans is natural while the one produced by machine is an artificial one. Sager added that while a translator understands a text, a machine only processes linguistic information. Moreover, Morry states that "As long as language continues to communicate more than the immediate literal meaning of words...one will continue to need human translators to get the job done" (as cited in Boukreris and Labeled, 2016, p. 276). Notice the translation of the following example from Ernest Hemingway's novel "*The Old Man and the*

see” (page 9):

**Table 1**

*An Example of Machine & Human Translation*

ST	MT	HT
<p>“He was an old man who fished alone in a skiff in the Gulf Stream and he had gone eighty-four days now without taking a fish”.</p>	<p>كان رجل عجوز الذين يصطادون وحدها في زورق في تيار الخليج، وانه ذهب أربعة وثمانين يوما دون الأسماك.</p>	<p>كان رجلا عجوزا يصطاد السمك وحيدا في زورق صغير في تيار الخليج وقد أمضى أربعة وثمانين يوما حتى الآن دون أن ينال سمكة.</p>

As we can notice here, machine translation has concentrated mainly on the source text and came up with some confusing associations which do not fit in the target language, such as the plural verb “يصطادون” and the plural pronoun “الذين”. As a result, the meaning of the sentence was distorted during the rendition from English into Arabic, and the translation was literal (Boulenouar, 2014, p. 158). Therefore, we can deduce the fact that man’s role in the translation process over the years is still significant and intrinsic despite the enormous development of machines and computers.

### **1.6 Aims of Machine Translation**

Hutchins and Somers (1992) claimed that the great deal of translations in the world is not for cultural and literal texts, but it has more to do with scientific, technical, legal, commercial and medical texts. The demand for such kind of translations is growing continuously. Thus, computer's assistance is obvious in such situations. They added also that usefulness of translation is judged by its output; however, in order to define the concept of good either by human or machine is a bit hard and challenging. In fact, translation depends on the specific circumstances in which it is done and the specific recipient to which it is made for. There are many criteria that can be applied also, such as the register, accuracy, fidelity, intelligibility and how appropriate the style of translation is.

According to Hutchins and Somers (1992), what really matters concerning MT is how much close the translation is to human translation or to the reader who is also a human being. In other words, translation must be as close as equivalent to human translation because the reader is a human as well. Since the concept of translation is such a slippery and not accurate, the developers of such translation systems tend to come up with systems which can produce suitable translations for suitable situations. This fact helps them to clarify clearly their research objectives, or to seek for suitable ways for such produced translations.

## **1.7 Conclusion**

In this first theoretical chapter, we have tried to explore the most intrinsic elements of machine translation, ranging from its definition, history, aims and various types to its comparison with human translation and translation memory, and we have come up with the conclusion that machine translation today has become an essential translating tool for human translators who took advantage of its constant progress and improvement in order to do their job. However, the issue of its success in translating certain types of texts is not resolved yet.

# **Chapter 2**

## **Translation of Literary and Technical Texts**

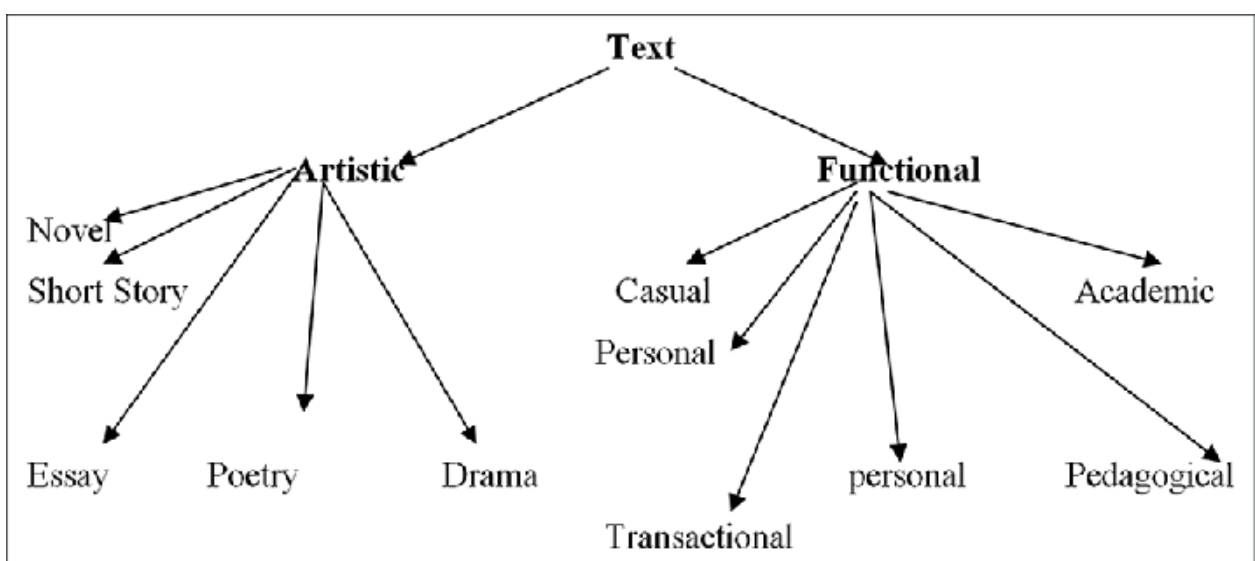
The translation of literary and technical texts is not an easy task; it requires an effort and enough knowledge from the part of the human translator about the field that those text types belong to so that he can succeed in transferring the intended meanings of those texts into the target language. Thus, in this chapter, we will start by giving a definition of both literary and technical texts. Then, we provide a thorough explanation of both technical translation and literary translation as well as their main problems and difficulties.

### 2.1 Definition of Literary Text

Before exploring the definition of literary text, it seems important to distinguish it from other types of texts in literature. Lucas (1990) divided texts into two major categories: artistic and functional. Artistic texts include novels, short stories, essays, poems and drama; however, functional texts consist of whatever texts other than artistic as shown in the figure below (Alasmari & Khan, 2018, p. 173):

**Figure 2**

*Lucas Classification of Literary Texts*



From the above diagram, it is clear that the literary text is artistic, as opposed to the functional text. Literary categories have typically the genres of literature: novel and short stories (usually referred to fiction), essay, poetry and drama. Unlike functional text which consists of six categories:

- 1- Casual texts include newspapers, magazines and non-fiction,
- 2- Personal texts include letters and diaries,
- 3- Transactional texts include business letters, legal documents, reports and instructions,
- 4- Reference texts include dictionaries, catalogues, directories and inventories,
- 5- Pedagogical texts include text books, encyclopedias,
- 6- Academic texts include research papers, theses, specialist books and journals

(Alasmari & Khan, 2018, p. 173).

## 2.2 Definition of Technical Text

According to the lesson of “Technical Text: Definition & Examples”, the concept Technical Text can be defined as “a text written with the purpose of educating or instructing” (2016, para. 7). This type of text can be grouped into four categories:

1. Reports and communications in day-to-day business,
2. Technical papers, magazines, articles, books and theses for purposes of education, teaching, and sharing information and knowledge,
3. Patents,
4. Operational manuals, instructions, or procedures (Budinski, 2001, p. 1).

Although researchers made a clear image of the term technical text, many people generally and students specifically find it somehow confusing to differentiate between technical text and scientific text. Therefore, the article entitled *scientific and technical texts* illustrated that technical text “provide detailed information about a specific topic or how to perform a specific task. User manuals, instructions, brochures, and recipes are examples of



technical text”. On the other hand, a scientific text “explains a scientific topic, such as the life cycle of a frog or the rings of Saturn. Science magazines, science textbooks and experiments are example of scientific text”.

Among the similarities, both types of text “write with the purpose or intention, to inform or explain. They often present information without expressing a personal point of view or position on the topic” (p. 1), they also include language, vocabulary and phrases that are relevant or in common usage to the specialized topic or subject: If the author is dedicating the subject/topic to the audience, s/he may use different ways to define the technical language s/he is using so that they can grasp the idea or information easily (2015).

## **2.3 Technical Translation**

Generally and according to Byrne (2006), technical refers to something that has to do with technology and technological texts; however, technical translation is a type of specialized translation involving the translation of certain documents that are usually written by experts in their field, for instance: economics, law, business...etc. Therefore, “technical translation deals with technological texts; or more specifically, technical translation deals with texts on subjects based on applied knowledge from the natural sciences” (p. 3). The aim of technical translation according to him is: “to ensure that all of the relevant information is indeed conveyed, but also that it is conveyed in such a way that the readers can use the information easily, properly and effectively” (p. 10).

### **2.3.1 Difficulties of Technical Translation**

Technical translation needs technical translators. Not any translator can get the job done; it is only reserved for the few of them who possess high skill of translation. Further, technical translation requires high level of subject knowledge and mastery of relevant terminology in order to perform communicative function (William & Chesterman, 2002). That is to say, a qualified technical translator understands the subject matter in the target field

and the vocabulary from both source language and target language. Moreover, translators require solid knowledge base to produce written passages that are identical to those of the target language (Fishbach, 1998). For example, the rendition of the French word “répandre” into English is “to spread” in everyday language, but when talking about insecticide, in English, we use the verb “to spread”; However, in French, we use the verb “traiter”. The same for the word “unscheduled”, in French, it is translated as “imprévu” in everyday language, but “an unscheduled maintenance” is translated as “un entretien curatif” (Delpech, 2014).

According to Lee-Jahnke (1998), there are three main things that are important to deal with scientific and technical texts:

- Know the text structure in the different languages,
- Know the LSP (Language for Specific Purposes) for the area,
- Know the subject area (p. 83-84).

The translator needs to know about the text structure and have sufficient subject knowledge of that area and know how to deal with the text. It also encompasses the translation of special language texts as it is defined by Wright and Wright (1993) “technical translation encompasses the translation of special language texts, i.e., texts written using Languages for Special Purposes (LSP)” (p. 1). It is, hence, important for the technical translator to have research skills and have very good understanding of the subject matter in a specific field. Further, Byrne (2006) summarized the necessary areas of expertise for technical translation:

- Subject knowledge,
- Writing skill,
- Knowledge of genres and text types,
- Pedagogical skills (p. 6).

## 2.4 Literary Translation

As any form of translation, literary translation “represents a distinctive kind of translating because it is concerned with a distinctive kind of text” (Hermans, as cited in Kuhiwczak & Littau, 2007, p. 77). However, the Oxford Advanced Learners’ Dictionary defines ‘literature’ as the “writings that are valued as work of art, especially fiction, drama and poetry in contrast with technical books and news-papers”. All in all, literary translation is “the translation of literature or other artistic texts, such as film scripts or music lyrics, as opposed to the translation of explanatory prose, such as information pamphlets, technical manuals, records, scientific papers, legal documents and the like” (Cincotta, 1995, p. 2). That is to say, literary translation is fundamentally different from other kinds of translations and this is due to the dominance of the “aesthetic function” (Kuhiwczak & Littau, 2007, p. 78).

### 2.4.1 Difficulties of Literary Translation

The aim of literary translation is not only conveying specific information from the source text to the target language, but it also tries to evoke a particular ‘emotional response’. To exemplify, taking the example of Mahadevi Verma’s poems, a distinguished poetess of Hindi, have romantic nature and evoke romantic feelings in his readers; therefore, if Mahadevi Verma’s poems fail to evoke the emotional response, the translation will not be considered ‘successful’. Within the same line, when narrating or describing events in a story about ghosts, the author should not only aim to convey specific information about supernatural beings, but s/he must also provide his or her audience with the sense of fear. Therefore, translating a story or poem have to reach an emotional appeal in such piece of writing (An Introduction to Literary Translation, n.d).

In this respect, it is important to take into consideration that when writing a literary translation, “we must not only focus on what the text says, but also on how the literary text has been made, constructed and put together (and here we can use a number of verbs, or

rather, metaphors which point to the process of creation of the literary text)” (Rossi, 2018, p. 3). Therefore, literary translators admit that translating literary texts is a complex process, because it is not about transferring the linguistic level but rather “any attempt at being faithful to the original piece of writing should entail making something that lives” (Hahn, 2014, n.p), he added that “it should have the same pulse as the original did” (2014, n.p). Therefore, it is not emphasizing on the semantic level of the written passage but rather on “what the text is as a whole and thus, what it achieves, what it does to us as readers. And to look at what the text does is precisely to ask the question how it does rather than what it says” (Rossi, 2018, p. 42).

Moreover, the diversity of languages, the variety of cultures and the importance of communications are mainly conveyed through the process of translation in order to transmit thoughts, culture and knowledge. Literary translation, hence, plays an effective role in linking the gaps between cultures. However, finding an appropriate equivalent of the terms between both the source and target languages is a complex process, because translation, here, is concerned with transferring the meanings from the original text into the selected language, and this means transferring the culture (Chaal, 2019), as Larson (1998) supported: “one of the most difficult problems facing a translator is how to find lexical equivalents for objects and events which are not known in the target culture”, due to the variety of cultures (p. 163). Therefore, translators are required to have thorough knowledge about cultures in order to locate the appropriate equivalence of the cultural concepts and terms (2019). So, it appears that the process of literary translation is not only restricted to locating words and sentences, but it is more about creating that desirable artistic correspondence or appropriate equivalents. Here, fulfilling the task of translating with accuracy signifies that the translator has achieved fundamental literary qualifications (Muslat, 2012).

Following the same point, since literary text has different linguistic features, translators need to take into consideration various characteristics that are required in literary

translation. They are summarized by Belhaag (1997) as follows:

- Expressive, connotative and symbolic,
- Focusing on both form and content,
- Subjective,
- Allowing multiple interpretation,
- Timeless and universal,
- Using special devices to 'heighten' communicative effect,
- Tendency to deviate from the language norms (p. 20).

## **2.5 Conclusion**

In this second theoretical chapter, we dealt with the issue of translating literary and technical texts, and we discussed the problems and difficulties of literary translation as well as technical translation. In addition to that, we shed light on the main challenges that the human translator may face while translating these text types which require from him an adequate background knowledge of the subject matter in the target field.

# **Practical Part**

**A Comparison between Machine and Human Translation of  
Technical and Literary Text**

Translating texts with a specialized language, such as literary and technical texts, is not an easy task for human translator, and it is a more difficult task for the machine systems of translation. Thus, in this practical part, we will provide a translation analysis of machine as well as human translations in selected samples that were taken from technical and literary texts, in addition to the discussions of the findings. This chapter is mainly concerned with the comparison between the human and machine translations in terms of grammatical, lexical and semantic differences between the two kinds of translations. We also underlined the words/phrases that were mistranslated /incorrectly rendered, evidently, by machine (google) translation, and for this matter, we used tables to facilitate the comparison process.

### 3.1 Translation Analysis of Technical Texts

**Table 2**

*A passage from Daniel Goleman's book "Emotional Intelligence" page 4*

<p><b>Source Text</b></p>	<p>A view of human nature that ignores the power of emotions is sadly short sighted. The very name <b><u>Homo sapiens</u></b>, the thinking species, <b><u>is misleading</u></b> in light of the new appreciation and vision of the place of emotions in our lives <b><u>that</u></b> science now offers.</p>
<p><b>Machine Translation</b></p>	<p>إن وجهة نظر الطبيعة البشرية التي تتجاهل قوة العواطف للأسف قصيرة النظر. اسم <u>الإنسان العاقل</u>، نوع التفكير، <u>مضلل</u> في ضوء التقدير والرؤية الجديدة لمكان العواطف في حياتنا <u>التي</u> يقدمها العلم الآن.</p>
<p><b>Human Translation</b></p>	<p>إن أي نظرة للطبيعة الإنسانية تتجاهل قوة تأثير العواطف هي نظرة ضيقة الأفق بشكل مؤسف. والواقع، أن اسم "<u>الجنس البشري</u>" ذاته "Homo Sapiens"، أي الجنس المفكر، <u>يعد تعبيراً خادعاً</u> في ضوء الرؤية والفهم الجديدين لموقع العواطف في حياتنا <u>واللذين</u> يطرحهما العلم الآن.</p>



**Translation analysis:**

Following the source text, machine translation provided a target text that contains some grammatical and lexical errors. For instance, the term “Homo Sapiens” is translated into Arabic as “إنسان عاقل”, which means a wise or mature person who has experience and knowledge to make good decisions and judgments. However, in this context, the term means “the species to which all modern human beings belong. *Homo sapiens* is one of several species grouped into the genus *Homo*, but it is the only one that is not extinct” (britannica.com). Thus, the more accurate equivalent to this term would be “الجنس البشري”. Also, the Google translation of the second sentence is literal and confusing since it lacks a verb as opposed to the human translation which was rendered more successfully. Furthermore, the singular pronoun “التي” is grammatically wrong, because “الرؤية و الفهم” is plural, and the pronoun “that” should be transferred into Arabic as “الذين”. Therefore, the Google translation has failed in rendering the source text into Arabic and the meaning of the sentences was disrupted.

**Table 3**

*A passage from Daniel Goleman's book “Emotional Intelligence” page 164*

<b>Source Text</b>	A vague ache in my <b>groin sent me</b> to my doctor. Nothing seemed unusual until he looked at the results of a urine test. I had traces of blood in my urine. "I want you to go to the hospital and get some tests . . . kidney function, cytology . . .," he said in a <b>businesslike</b> tone. I don't know what he said next. My mind seemed to freeze at the word <b>cytology</b> . Cancer.
<b>Machine Translation</b>	أرسلني ألم غامض في فخذي إلى طبيبي. لم يبد أي شيء غير عادي حتى نظر إلى نتائج اختبار البول. كان لدي آثار دم في بولي. قال بنبرة تشبه الأعمال: "أريدك أن تذهب إلى المستشفى وتجري بعض الفحوصات ... وظائف الكلى، وعلم الخلايا ...". لا أعرف ماذا قال

	بعد ذلك. بدا أن عقلي يتجمد عند كلمة <u>علم الخلايا</u> . سرطان.
<b>Human Translation</b>	شعرت بألم خفيف في <u>مفصل الفخذ</u> <u>دفعني</u> لزيارة طبيبي الخاص. كان كل شيء يبدو طبيعياً، إلى أن نظر في نتائج تحليل البول، فوجد به آثاراً قليلة من الدم. قال لي الطبيب بنبرة <u>عملية</u> : «أريد منك الذهاب إلى المستشفى، لإجراء بعض التحاليل... تحليل وظائف الكلى، وفحص خلوي». «...لم أسمع بعد ذلك أي شيء من حديثه. تجمد فكري عند كلمة « <u>تحليل خلوي</u> ». اقتحمت عقلي كلمة «سرطان».

### Translation analysis:

In this passage also, we can notice some lexical errors in the translation of Google. For example, the verb “أرسلني” is a lexical mismatch; it does not convey the meaning of the sentence correctly. Thus, it is not the accurate equivalent verb for this context, and the verb “دفعني” is more appropriate. Furthermore, the adjective “businesslike” is translated into “الأعمال”, which has a different meaning than that of the source text. It means being “practical and effective in the way you work and organize things, or in your behaviour and appearance” (ldoceanline.com). The machine system, in this case, was also unable to come up with the appropriate equivalent of the word mentioned in the source text. Further, it is important to mention that the term “groin” in dictionary refers to “the area between the abdomen and the upper thigh on either side of the body” (Oxford Dictionary), so its accurate equivalent should be “مفصل الفخذ” and not “الفخذ” as in the translation of google. Moreover, the term “علم الخلايا” is a broad domain in medicine and it is a wrong rendering by google to the term “cytology” in the source text because it disturbs the general meaning of the passage and misleads the readers. Thus, the translation of Google has failed to render the appropriate meanings of terms according to the context of the text, but the human translation is more accurate in terms of meanings and terminology.

Table 4

A passage from Daniel Goleman's book "Emotional Intelligence" page 166

<p><b>Source Text</b></p>	<p>The immune system is the "<b>body's brain</b>," as neuroscientist Francisco Varela, at Paris's Ecole Polytechnique, puts it, defining the body's own sense of self—of what belongs within it and what does not. Immune cells travel in the <b>bloodstream</b> throughout the entire body, contacting virtually every other cell. Those cells they recognize, they leave alone; <b>those they fail to recognize, they attack</b>. The attack either defends us against viruses, bacteria, and cancer or, if the immune cells misidentify some of the body's own cells, creates an autoimmune disease such as allergy or lupus.</p>
<p><b>Machine Translation</b></p>	<p>إن جهاز المناعة هو "<b>دماغ الجسم</b>"، كما قال عالم الأعصاب فرانسيكو فاريللا ، في مدرسة الفنون التطبيقية في باريس ، محددًا إحساس الجسم بالذات - لما ينتمي إليه وما لا ينتمي إليه. تنتقل الخلايا المناعية في <b>مجري الدم</b> في جميع أنحاء الجسم، وتتصل تقريبًا بكل خلية أخرى ، وتترك الخلايا التي تتعرف عليها وحدها ؛ <b>أولئك الذين فشلوا في التعرف عليهم ، يهاجمون</b>. الهجوم إما يدافع عنا ضد الفيروسات والبكتيريا والسرطان، أو إذا أخطأت الخلايا المناعية في التعرف على بعض خلايا الجسم، فإنها تخلق مرضًا مناعيًا ذاتيًا مثل الحساسية أو الذئبة.</p>
<p><b>Human Translation</b></p>	<p>إن الجهاز المناعي هو "<b>عقل الجسد</b>"، كما عرفه عالم الأعصاب «فرانشيسكو فاريللا Varela Francisco» بكلية البوليتكنيك بباريس بأنه : إحساس الجسد بذاته، ما يخصه بداخله، وما لا يخصه». تسري خلايا المناعة في <b>الدورة الدموية</b> إلى جميع أعضاء الجسم، وتتصل عمليا بكل خلاياه، <b>وتهاجم الخلايا التي لا تتعرف عليها</b>. هذا الهجوم لخلايا المناعة إما أن يدافع عن الجسم ضد الفيروسات، والبكتيريا، والسرطان، وإما يخلق مرض مناعة ذاتية، مثل الحساسية أو مرض الذئبة، إذا فشل في التعرف على بعض خلايا الجسد ذاته.</p>

**Translation analysis:**

The translation of this text by Google was very literal. For example, the rendition of the expression "body's brain" into "دماغ الجسم" is inaccurate in this position, and the expression "عقل الجسد" is more appropriate. The same for "bloodstream" which was also translated literally by Google into "مجرى الدم" instead of "الدورة الدموية". Furthermore, the sentences seem confusing and unlinked to together, such as "those they fail to recognize, they attack" was translated literally into an incomprehensible sentence "أولئك الذين فشلوا في التعرف "، عليهم ، يهاجمون"، and in a wrong word order. Unlike human translation which maintained the meaning of the source text, and readers can easily understand the message of the passage due to the coherence and cohesion of sentences, and this is why, there was no disruption in the meaning.

**Table 5**

*A passage from Daniel Goleman's book "Emotional Intelligence" page 167*

<b>Source Text</b>	In electron-microscope studies, they found synapse like <b>contacts</b> where the nerve terminals of the autonomic system have endings that directly <b>abut</b> these immune cells. This physical contact point allows the nerve cells to release neurotransmitters to regulate the immune cells; indeed, <b>they signal back and forth. The finding is revolutionary.</b> No one had suspected that immune cells could be targets of messages from the nerves.
<b>Machine Translation</b>	في دراسات المجهر الإلكتروني، وجدوا المشابك مثل <b>جهات الاتصال</b> حيث يكون للأطراف العصبية في الجهاز الإرادي نهايات <b>تتاخم</b> مباشرة هذه الخلايا المناعية. تسمح نقطة الاتصال الجسدية هذه للخلايا العصبية بإطلاق ناقلات عصبية لتنظيم الخلايا المناعية؛ في الواقع، <b>فإنهم يشيرون ذهابًا وإيابًا. الاكتشاف ثوري.</b> لم يشك أحد في أن الخلايا المناعية يمكن أن تكون أهدافًا للرسائل من الأعصاب.
	وجدوا في دراستهم بالميكروسكوب الإلكتروني <b>نقاط اشتباك</b> تتلاصق فيها نهايات <b>أعصاب</b> الجهاز

<p><b>Human Translation</b></p>	<p>اللاإرادي مباشرة بهذه الخلايا المناعية. تسمح نقاط الاتصالات الفيزيائية هذه للخلايا العصبية بأن تطلق رسائل عصبية لتنظيم خلايا المناعة، <u>والواقع أنها تعطي إشارة جينية وذهابا. وهذه النتائج نتائج ثورية</u>، حيث لم يسبق أن توقع أحد أن تكون الخلايا المناعية هدفا للرسائل الآتية من الأعصاب.</p>
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### Translation analysis:

In translating this passage, the machine system provided a rendition that contains some lexical and semantic ambiguity. For example, the word “contacts” the system translated it into "جهات الاتصال" which is not a suitable equivalent in this context as well as the word “abut” that was rendered wrongly into the target language as "تتأخم". Also, sentences as “فإنهم” are semantically wrong and incoherent. That is to say, the translation made by the machine engine failed to convey the exact meaning of the passage as opposed to the human translation which was more correct and semantically coherent.

**Table 6**

*A passage from Adel Azzam’s book “The Reliable Guide to Legal Translation” page 84*

<p><b>Source Text</b></p>	<p>أنا الموقع أدناه: .....</p> <p>أفوض: .....</p> <p><u>ليقوم مقام نفسي</u> و ينوب عني في بيع ما مساحته (.....) في قطعة الأرض رقم (....) من <u>حوض</u> رقم (...) المسمى (...) من أراضي (...) لمن يشاء بالبدل والتمن الذي يراه مناسباً. وأفوضه في البيع والهبة والرهن وفك الرهن و<i>الإفراز</i> والمبادلة في حصصي كلها أو بعضها وضمها وتوحيدها مع أية قطعة أخرى يراها مناسبة. وأفوضه باستلام المخططات وسندات التسجيل الخاصة بهذه القطعة وله حق الإشراف والمناظرة والإدارة وقبض الإيجارات وفي إنشاء الأبنية عليها واستصدار التراخيص اللازمة لذلك وزراعتها و<i>حفر أبار المياه</i> بأنواعها والتوقيع على الإقرارات العدلية والتعهدات أمام كاتب العدل لغايات الرهن أو الإفراز، وله الحق في توجيه الإنذارات العدلية وإقامة الدعاوى باختلافها أمام جميع المحاكم وتوكيل الغير لتمثيلي</p>
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	<p>أمام المحاكم. وله بذلك التوقيع على كل ما يلزم من الأوراق أمام <u>دوائر الأراضي والمساحة</u> وجميع الدوائر الرسمية والغير رسمية في المملكة الأردنية الهاشمية المتعلقة بهذا الخصوص.</p>
<p><b>Machine Translation</b></p>	<p>I the undersigned: .....</p> <p>I authorize: .....</p> <p><b><u>To take the place of myself</u></b> and represent me in selling an area (...) in plot No. (...) of <b><u>Basin</u></b> No. (...) named (...) of the land (...) to whomever he wants. In exchange and at the price he deems appropriate. I authorize him to sell, gift, mortgage, redeem, <b><u>set aside</u></b>, exchange all or part of my shares, and combine and unify them with any other piece he deems appropriate. I authorize him to receive the plans and registration documents related to this plot, and he has the right to supervise, debate, manage, collect rents, construct buildings on them, issue the necessary licenses for this, plant them, <b><u>dig water wells</u></b> of all kinds, and sign legal declarations and pledges before the notary public for the purposes of mortgage or secretion. He has the right to issue judicial warnings, file various cases before all courts, and assign others to represent me before the courts. With this, he has the right to sign all the necessary papers before <b><u>the departments of land and survey and all official and unofficial departments</u></b> in the Hashemite Kingdom of Jordan related to this matter.</p>
	<p>I, the undersigned,.....</p> <p>Authorize:.....</p> <p><b><u>To act on my behalf</u></b> in selling an area of (...) of the plot No. (...), <b><u>zone</u></b> No/ (...) called (...) of (...) lands for whomever he wants and for the price or allowance he deems suitable; I authorize him in selling, endowing,</p>

<p><b>Human Translation</b></p>	<p>mortgaging, dismortgaging, exchanging and <b><u>apportioning</u></b> all or part of my shares. Also in merging or joining the plot with another he deems suitable and in receiving blueprints and registration documents related to this plot. I also authorize him the right of supervising, superintending, managing, receiving rents, establishing buildings on the plot, procuring required licenses, cultivating the plot, <b><u>drilling any type of wells</u></b>, signing judicial affirmances and pledges before the Notary Public for the purposes of mortgage and apportionment shares. He also has the right to forward judicial notices, institute legal proceedings of whatever types before any of the course and to authorize others to represent me before courts. Hence, in this regard, he has the right to sign on all necessary papers before the <b><u>Departments of Lands and Surveys and before any official or non-official department</u></b> in the Hashemite Kingdom of Jordan.</p>
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### Translation analysis:

The first impression of the above text indicates that human translation is a bit longer than the machine translation. It is unsurprising that the machine translation did not achieve the translation quality, and this appears in the repetition of the coordinator “and” in the sentence of “...the departments of land and survey and all official and unofficial departments in the Hashemite Kingdom of Jordan...”. In this case, the human translation is in many ways, such as length, information flow, and structure is more similar to the source text than the machine translation. In addition, the machine translation could not produce a readable text. It could not reach the level of accuracy of the human translation due to the mismatch of vocabulary, and the inability of machine translation to choose the accurate equivalents of

concepts and words that are appropriate to the context of the source text, such as the wrong rendition of the term “الإفراز” into English as “set a side”. Other examples of lexical mismatch and semantic ambiguity in the translation of google are: “basin”, “dig water well”, and “to take the place of myself”. These words disturbed the original meaning of the source text. Thus, we can notice that the translation of google was not successful in rendering this text into English.

**Table 7**

*A passage from Schumpeter’s book “Capitalism, Socialism and Democracy” page 45*

<p><b>Source Text</b></p>	<p>We have seen how in the Marxian argument sociology and economics <b>pervade</b> each other. <b>In intent</b>, and to some degree also in actual practice, they are one. All the major concepts and propositions are hence both economic and sociological and carry the same meaning on both planes—if, from our standpoint, we may still speak of two planes of argument. Thus, the economic category “labor” and the social class “<b>proletariat</b>” are, on principle at least, made congruent, in fact identical. Or the economists’ functional distribution—that is to say, the explanation of the way in which incomes emerge as returns to productive services irrespective of what social class any recipient of such a <b>return</b> may belong to—enters the Marxian system only in the form of distribution between social classes and thus acquires a different connotation.</p>
	<p>لقد رأينا كيف <b>يتغلغل</b> علم الاجتماع والاقتصاد في الحجة الماركسية. <b>في النية</b>، وإلى حد ما أيضًا في الممارسة الفعلية، هم واحد. جميع المفاهيم والافتراضات الرئيسية هي بالتالي اقتصادية واجتماعية وتحمل نفس المعنى في كلا المستويين -إذا كنا، من وجهة نظرنا، قد لا نزال نتحدث عن مستويين من الجدل. وهكذا، فإن الفئة الاقتصادية "العمل" والطبقة</p>



<p><b>Machine Translation</b></p>	<p>الاجتماعية "البروليتاريا"، من حيث المبدأ على الأقل، متطابقتان، في الواقع. أو التوزيع الوظيفي للاقتصاديين -أي تفسير الطريقة التي يظهر بها الدخل كعوائد للخدمات الإنتاجية بغض النظر عن الطبقة الاجتماعية التي قد ينتمي إليها أي متلقي لمثل هذا <u>العائد</u> - يدخل النظام الماركسي فقط في شكل التوزيع بين الطبقات الاجتماعية وبالتالي يكتسب دلالة مختلفة.</p>
<p><b>Human Translation</b></p>	<p>لقد رأينا كيف <u>تحلل</u> السوسيولوجيا والاقتصاد، و أحدهما في الآخر، في الحجة الماركسية. وهما واحد <u>من حيث القصد</u> ومن حيث الممارسة الفعلية أيضا، لكن بمقدار ما. وجميع التصورات والنظريات الرئيسية هي، بالتالي، اقتصادية وسوسيولوجية معا، وتحمل المعنى ذاته على المستويين، كليهما، هذا، اذا كنا مازلنا نتكلم عن مستويين للحجة، من وجهة نظرنا. وهكذا فإن مقولة "العمل" الاقتصادية وطبقة "البروليتاريا" الاجتماعية، جعلنا متطابقتين، من حيث المبدأ عللا الأقل، بل جعلنا على هوية واجدة. أو توزيع الاقتصاديين الوظيفي - أي شرح طريقة ظهور المداخل كعائدات للخدمات الإنتاجية، بصرف النظر عن الطبقة التي ينتمي إليها المتلقي لمثل هذه <u>العائدات</u> - لا يدخل في النسق الماركسي إلا على صورة توزيع بين الطبقات الاجتماعية وبالتالي يكتسب معنى جديد.</p>

### Translation analysis :

From translating this economic text, we found some cases of grammatical mistakes, such as the word "العائد" which is singular in google translation; however, in this context, it should be plural. We found also in this passage some, for instance, the term "البروليتاريا", which has no equivalent in the target language and in both translations. Further, the phrase "in intent" was unnaturally rendered by Google translation into "في النية", which is semantically wrong in this context. In addition, the verb "pervade" is translated into "يتغلغل", which is not the appropriate equivalent in this context, and the verb "تحلل" is more accurate. In this respect, the machine translation was poor in recognising the correct meaning of the words mentioned in the source text. Also, it shows that machine system does not have enough knowledge about some Arabic vocabulary that can help in choosing the appropriate terms to

render all the words into the target language.

**Table 8**

*A selected passage from a text of Politics*

<p><b>Source Text</b></p>	<p>في إطار النهج القومي الثابت والواضح الذي اختطته القيادة الهاشمية منذ ان قامت الدولة الاردنية كان عبدالله الثاني بن الحسين حامل رسالة الامة بحق وهو يخاطب قادتها في قمة الدوحة بلغة مباشرة وبمضمون واضح بعيد المرامي والاهداف ويوعي على المستجدات واضعا النقاط على الحروف <b>لمواجهة التحديات</b> والتحويلات التي تهدد الامن القومي وذلك على أساس بناء رؤية استراتيجية موحدة للتعامل مع المستجدات الحالية والمستقبلية لحماية مصالحنا وقدراتنا على التأثير الفاعل في الاحداث. وأول متطلبات هذه الاستراتيجية كما يراها الملك استكمال تنقية الاجواء العربية وتجاوز الخلافات وتوحيد المواقف والجهود وتعزيز مبدأ التضامن العربي مؤكدا على ان هذا التضامن ليس شعارا يرفع وإنما هو فعل وعمل يقوم على العلاقات المؤسسية. وهذا هو ديدن الملك في كل تحركاته ومساعيه وخطواته فالقضايا القومية عندنا دائما تتقدم على كل ما هو قطري ويحرص دائما على تعزيز أواصر الاخوة والتعاون بما يحقق المصالح والاهداف المشتركة وضمن اتفاقات وأسس مؤطرة تحدد أسس التعاون والمنافع المتبادلة وبما يكفل الديمومة وتحبيدها عن كل الخلافات الجانبية وبخاصة في المجالات الاقتصادية والمشاريع المشتركة والتي هي الطريق الممهد للوحدة.</p>
<p><b>Machine Translation</b></p>	<p>Within the framework of the consistent and clear national approach that the Hashemite leadership has planned since the establishment of the Jordanian state, Abdullah II bin Al Hussein was truly the bearer of the nation's message as he addressed its leaders at the Doha Summit in direct language and with clear content far from goals and objectives and with awareness of developments, putting points on letters <b>to confront challenges</b> and transformations that threaten security. This is based on building a unified strategic vision to deal with current and future developments to protect our interests and our capabilities to effectively</p>

	<p>influence events. The first requirement of this strategy, as the King sees it, is to complete the purification of the Arab atmosphere, overcome differences, unify positions and efforts, and strengthen the principle of Arab solidarity, stressing that this solidarity is not a slogan that raises, but rather an action and action based on institutional relations. And this is the King's plan in all his moves, endeavors and steps. Our national issues always take precedence over all that is Qatari, and he is always keen to strengthen the bonds of brotherhood and cooperation in a way that achieves common interests and goals and within agreements and framed foundations that define the foundations of cooperation and mutual benefits in a manner that ensures permanence and neutralizes them from all side disputes, especially in Economic fields and joint projects, which are the paved way for unity.</p>
<p><b>Human Translation</b></p>	<p>Along the lines of the consistent and clear approach drawn by the Hashemites upon the foundation of the Jordanian state, King Abdullah II demonstrated that he was a truthful bearer of the Nation's Message when addressing the Doha Summit. Not only was his speech straightforward, clear and insightful, but it also showed awareness of current developments putting record straight in an (faithful) endeavor <b><u>to face up the challenges</u></b> and changes that pose a threat to the national security on the basis of building a unified (Pan-Arab) strategic vision to address current and prospective developments and our ability to be effective players on the world arena. But one main requirement of this strategy, as His Majesty envisages, is to pursue the clearing up of the Arab atmosphere, settle all differences, take up a unified stand, and boost Arab solidarity, a principle</p>

	<p>that needs be not held as a hollow slogan but turned into action based on institutional relations. This manifests the very attitude of His Majesty who has always been keen in all his endeavors to give precedence to Pan-Arab concerns over narrow national interests. That is why he is keen to improve brotherly ties and cooperation among Arab states but in a manner that would serve common goals and interests that must be well governed by rationalized agreements and rules that make these ties sustainable and neutral from any marginal differences particularly in the economic domain and joint projects. And, this is what paves the way to unity.</p>
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### **Translation analysis:**

Reading the text of machine translation shows a literal translation of the source text. The text of Google translation is not far from the source text, but instead it somehow provided a clear idea about the content of the given message. The sentences generated by machine can make the reader grasp the meaning easily; at the lexical level, the vocabulary knowledge were somehow closely related to the source text, such as the translation of “confront challenges” into “مواجهة التحديات” is correct. Further, machine translation showed the fact that it is quicker than human translator, and it can translate as much information as possible. As opposed to machine translation, the human translation has concentrated more on style and structure in rendering the source text into English. The sentences consist of two or three independent clauses, and joined by coordinators. Further, the translator tried to find the closest equivalents to the words of the source text in order to convey the message correctly to the reader.

### 3.2 Translation Analysis of Literary Texts

**Table 9**

*A selected passage from Tayeb Saleh's short story "A Handful of Dates"*

<p><b>Source Text</b></p>	<p>ولابد أن جدي كان فارح الطول، إذ أنني لم أرَ أحداً في سائر البلد يكلم جدي إلا وهو يتطلع إليه من أسفل، ولم أرَ جدي يدخل بيتاً إلا وكان ينحني انحناءة كبيرة تذكرني بانحناء النهر وراء غابة الطلح. كان جدي طويلاً ونحياً وكنيت أحبه وأتخيل نفسي، حين استوي رجلاً <u>أذرع الأرض مثله في خطوات واسعة</u>. وأظن جدي كان <u>يوثرني</u> دون بقية أحفاده. ولست أومه، فأولاد أعمامي كانوا أغبياء وكنيت أنا طفلاً ذكياً. هكذا قالوا لي. كنت أعرف متى يريدني جدي أن أضحك ومتى يريدني أن أسكت، وكنيت أتذكر <u>مواعيد</u> صلاته، فأحضر له ((<u>المصلاة</u>)) وأملأ له الإبريق قبل أن يطلب ذلك مني. كان يلذ له في ساعات راحته أن يستمع إليّ أقرأ له من القرآن بصوت منغم، وكنيت أعرف من وجه جدي أنه أيضاً كان <u>يطرب له</u>.</p>
<p><b>Machine Translation</b></p>	<p>My grandfather must have been very tall, for I did not see anyone in the rest of the country speaking to my grandfather without looking at him from below, and I did not see my grandfather entering a house without making a great bow that reminded me of the bend of the river behind the acacia forest. My grandfather was tall and slender, and I loved him, and I imagined myself, as a man <u>straddling the arms of the earth at great strides</u>. I think my grandfather used to <u>influence</u> me without the rest of his grandchildren. I don't blame him, my cousins were stupid and I was a smart kid. So they told me. I knew when my grandfather wanted me to laugh and when he wanted me to be quiet, and I remembered the dates of his <u>prayers</u>, so I would bring him the (<u>prayer</u>) and fill him the jug before he asked me to do so. In his spare hours, he enjoyed listening to me reciting the Qur'an to him in a toned voice, and I knew from my grandfather's face that he was also <u>pleased with him</u>.</p>

<p style="text-align: center;"><b>Human Translation</b></p>	<p>My grandfather must also have been extremely tall, for I never saw anyone in the whole area address him without having to look up at him, nor did I see him enter a house without having to bend so low that I was put in mind of the way the river wound round behind the wood of acacia trees. I loved him and would imagine myself, when I grew to be a man, tall and slender like him, <u>walking along with great strides</u>. I believe <u>I was his favourite</u> grandchild: no wonder, for my cousins were a stupid bunch and I—so they say—was an intelligent child. I used to know when my grandfather wanted me to laugh, when to be silent; also I would remember the <u>times</u> for his prayers and would bring him his <u>prayer-rug</u> and fill the ewer for his ablutions without his having to ask me. When he had nothing else to do he enjoyed listening to me reciting to him from the Koran in a lilting voice, and I could tell from his face that <b><u>he was moved</u></b>.</p>
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### Translation analysis:

In this sample, we can figure out that several semantic, grammatical and lexical errors are noticed in the google translation when comparing it to the human translation. First, the expression "أذرع الأرض", here, denotes the long walking strides. The word "ذراع" for instance, is considered as a measurement of length. Thus, it was transferred into a verb denoting that this person is intending to walk along with long strides as it is suggested in the HT. However, the MT, here, rendered the word "ذراع" literally into "arms" but the associative meaning of "ذراع" cannot be captured in English where the word "feet" is the one that is naturally used in English. Thus, the MT failed in rendering the meaning while the HT succeeded in transferring the full context to the receptors. Moreover, the second mistake can be found in the word "يؤثر". In Arabic, we do possess the diacritics system where we can utter

the words according to the context. Here, the MT did not rely on the context, instead, it relied on the literal meaning of the word where it was understood as "يؤثر" which stands for the verb to "influence". The broader context following this entity of meaning made it clear that this person is the favourite to his grandfather because he can help and understand his needs without revealing them. Thus, the HT is also helping us to understand the full context as the human brain could be aware of such meanings and the use of diacritics. Thus, with the use of these vowel markers the word "يؤثر" is understood as "يؤثر" which stands for "الإيثار" or favouring things in English. An example of grammatical error in the translation of Google is that the Arabic pronoun "له" is translated wrongly into English as "him" instead of "it". Also, rendering the words "مواعيد" into "dates" and "المصلاة" into "prayer" is also a lexical mismatch.

**Table 10**

*A selected passage from William Shakespeare's "sonnet 18"*

<p><b>Source Text</b></p>	<ol style="list-style-type: none"> <li>1) Shall I compare thee to a summer's day?</li> <li>2) Thou art more lovely and more temperate.</li> <li>3) Rough winds do shake the darling buds of May,</li> <li>4) And summer's lease hath all too short a date:</li> <li>5) Sometime too hot the eye of heaven shines,</li> <li>6) And often is his gold complexion dimmed;</li> <li>7) <b><u>And every fair from fair sometime declines,</u></b></li> <li>8) By chance or nature's changing course untrimmed;</li> <li>9) <b><u>But thy eternal summer shall not fade,</u></b></li> <li>10) <b><u>Nor lose possession of that fair thou owest;</u></b></li> </ol>
	<p>(1) هل أقارنك بيوم صيفي؟  (2) انت أكثر جميلة وأكثر اعتدالا.</p>

<p style="text-align: center;"><b>Machine Translation</b></p>	<p>(3) تهز الرياح العاتية براعم مايو العريضة،  (4) ولا يلبث الصيف حتى يزول.  (5) في بعض الأحيان تسطع عين السماء،  (6) وغالبًا ما تكون بشرته الذهبية باهتة؛  (7) <u>وكل معرض من معرض ينخفض في وقت ما،</u>  (8) عن طريق الصدفة، أو مسار الطبيعة المتغير، بلا حدود؛  (9) <u>لكن صيفك الأبدى لن يتلاشى،</u>  (10) <u>ولا تفقد ملكية هذا المعرض الذي تدين به؛</u></p>
<p style="text-align: center;"><b>Human Translation</b></p>	<p>(1) من ذا يقارن حسنك المغري بصيف قد تجلى؟  (2) وفنون سحرك قد بدت في ناظري أسمى وأعلى.  (3) تجنى الرياح العاتيات على البراعم وهي جذلى،  (4) والصيف يمضي مسرعا اذ عقده المحدود ولى.  (5) كم أشرقت عين السماء بحرما تلتهب،  (6) ولكم خبا في وجهها الذهبي نور يغرب؛  (7) <u>لابد للحسن البهي عن الجميل سيذهب،</u>  (8) فالدهر تغير واطوار الطبيعة قلب؛  (9) <u>لكن صيفك سرمدى ما اعتراه ذبول،</u>  (10) <u>لن يفقد الحسن الذي ملكت فيه بخيل؛</u></p>

### Translation analysis:

According to the Arab readers, the summer is connected to heat and sweat, but to the English readers, who get bored of snow, clouds and cold, it is a beautiful day. The machine system had better to translate the word "جميلة" into "جمالا", so grammatical mistakes should be taken into account. After comparing both translations, we found that the expression "eye of



heaven" is a symbol of "the sun", which is well-figured in both translations. The machine translation of line 7 semantically was inappropriate, as the phrase “كل معرض من معرض ينخفض” did not give the exact meaning of the line mentioned in the source text, so it is important to pay attention to semantic mistakes as well. Also, the verb “ينخفض” is not accurate equivalent for the word “decline” as it means (end or vanish); therefore, the machine system failed to give the exact meaning, while the human translation succeeded. In line 9, both translations conveyed the correct meaning for the word “fade”. The tenth line, translated by the machine, did not give the correct meaning of the line; it is semantically wrong, on the contrary, the human translation gave a free translation but more close to the meaning of the source text.

**Table 11**

*A selected passage from Edgar Allan Poe’s poem “Alone”*

<b>Source Text</b>	<p>From childhood’s hour I have not been  As others were—I have not seen  As others saw—I could not bring  My passions from a common <u>spring</u>  From the same source I have not taken  My sorrow—<u>I could not awaken</u>  <u>My heart to joy at the same tone</u></p>
<b>Machine Translation</b>	<p>منذ ساعة الطفولة لم أكن كذلك  كما كان الآخرون – لم أر كما رأى آخرون  لم أستطع إحضار عواظي من ربيع مشترك  من نفس المصدر لم آخذ حزني  <u>لم أستطع الاستيقاظ بفرح قلبي بنفس النعمة</u></p>
<b>Human</b>	<p>منذ ساعات الصبا لم أكن كالأخرين  لم أرى كالأخرين</p>

<b>Translation</b>	<p>لم أجلب مشاعري من <u>ينبوع</u> مُشترك  لم آخذ حزني من نفس المصدر  <u>لم أستطع إيقاظ قلبي على فرحة لها نفس اللحن</u></p>
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### Translation analysis:

After comparing the two translations of google and human to this sample, we noticed some of the semantic errors in the translation of google. Google translated the word “spring” into Arabic literally as “ربيع” which is a name of one of the seasons of the year. As opposed to the google translation, human translation gave it a more accurate and relevant equivalent in this context which is “ينبوع”, that denotes “a place where water moving underground finds an opening to the land surface and emerges” (usgs.gov). Also, the sentence “لم أستطع الاستيقاظ يفرح” “قلبي بنفس النغمة” in the translation of Google is semantically and syntactically wrong. Yet, it is worth mentioning that both machine and human translations were, to some extent, close and acceptable.

**Table 12**

*A selected passage from Nizar Qabbani’s poem “This is Damascus”*

<b>Source Text</b>	<p>هذي دمشق ...  وهذي الكأس والراح  <u>إني أحب... وبعض الحب ذباح</u>  أنا دمشقي... لو <u>شرحت</u> جسدي  <u>لسال</u> منه عناقيد... وتفاح</p>
<b>Machine translation</b>	<p>This is Damascus...  And this is the cup and <u>the rest</u>  <u>I love...</u> and <u>some love is a slaughter</u>  I am Damascene... if you <u>explain</u> my body</p>

	I <b>asked</b> him for bunches... and apples
<b>Human Translation</b>	<p>This is Damascus</p> <p>And this is a <b>glass of spirit</b> (comfort)</p> <p><b>I am in love</b> – but I am aware of the fact</p> <p>That <b>certain kinds of love</b></p> <p><b>Can slaughter you in wrath</b></p> <p>I am a Damascene if you <b>dissect</b> me into halves</p> <p>You will have but grapes and apples <b>falling in</b> your path</p>

In translating this passage, we noticed some semantic and lexical errors in the translation of Google. For instance, the words “شرحتم” and “سال” were rendered into Arabic wrongly as “explain” and “asked” because the translation of Google has relied on the phonetics of the terms and produced irrelevant lexical equivalents. In the translation of Google, the phrase “إني أحب” was wrongly combined with the previous line and was rendered into “the rest I love” instead of “I am in love” which was successfully translated by the human translator. It is worth mentioning that in the following line, Google translation presented a more accurate /suitable rendering of the sentence “وبعض الحب ذباح” which was literally and successfully translated into “And some love is a slaughter. As opposed to human translation which went for overtranslation when it translated the line into “That certain kind of love can slaughter you in a wrath” which in my opinion was unnecessary. Nevertheless, Google translation made some errors on the lexical level.

### Table 13

*A passage from Mahmoud Darwish's poem “The Dice Player”*

ST	MT	HT
مَنْ أَنَا لِأَقُولَ لَكُمْ	Who am I to tell you	Who am I to say to you

ما أقولُ لكم؟	What do I tell you?	What I am saying to you?
وأنا لم أكنُ حجراً صَقَلْتُهُ المِياهُ	And I was not a stone	I was not a stone polished by
فأصبح وجهاً	polished by water	water
ولا قصباً ثَقَبَتْهُ الرِياحُ	became a face	And became a face
فأصبح نايًا ...	Nor a reed pierced by the	Nor was I a cane punctured
أنا لآعب النردِ،	wind	by the wind
أربح حيناً وأخسر حيناً	He became a flute...	And became a flute...
أنا مثلكم	I'm a dice player,	I am a dice player,
أو أقلُّ قليلاً ...	Sometimes I win and	Sometimes I win and
وُلدتُ إلى جانب البئرِ	sometimes I lose	sometimes I lose
والشجراتِ الثلاثِ الوحيداتِ	I'm like you	I am like you
كالراهباتِ	Or a little less...	Or slightly less...
وُلدتُ بلا رَقَّةٍ وبِلا قابِلَة	I was born by the well	I was born next to the well
	And the three lonely trees are	And the three lonely trees,
	like nuns	lonely like the nuns...
	I was born without a wedding	Born without a celebration
	and without a midwife	and without a midwife

### Translation analysis:

We intentionally chose this part of the poem to also highlight the fact that machine translation is not always inaccurate and/or unacceptable. In the translation of this sample, both human and machine translation have succeeded grammatically, lexically and semantically in rendering the verses accurately into English. Only few cases of difference between the two translation in some words, but the general meaning of the source text is there in both translations.

### 3.3 Discussion

The focus of this research was on exploring machine translation. The case study was a comparison between machine (Google) translation and human translation. For this purpose, a corpus of five literary texts and seven technical texts was selected. Therefore, this part presents the discussion of the research findings which provides evidence to answer the statement of the problem.

This study was conducted in order to compare and contrast adequacy in Google translation versus human translation. The qualitative results of the research could show that there were many differences between both translations. In our case, the human translation could produce a translation which was very close to the source texts. The obtained results also revealed that human translation in terms of length, information flow and structure were more similar to the source texts. Google translation, however, was weaker because the first three technical texts revealed several errors semantically, syntactically and grammatically. For instance, in the first text, Google translation failed to translate the terms “Homo Sapiens” and “misleading” into Arabic since it rendered them literally. Further, its translations were incomprehensible in general and the meaning or the message of the source text could not be transmitted (cohesion and coherence problems).

Within the same vein, Google translation did not match up the quality and accuracy of human translation, and this is why, it is not yet put to reliable use. However, the quality of Google translation can be developed by many ways, such as improving rules of systems and formalism. As it is shown in the text of Law, the meaning was, to some extent, comprehensible. Moreover, Google translation output could not reach the level of human translation as in the first text of science: the singular pronoun “التي” should be translated into "الذين", but the machine failed to avoid this grammatical mistake. Additionally, several

examples of Google translation errors can be noticed as follows: in terms of cohesion, “my heart to joy at the same tone” is wrongly translated into "لم أستطع الاستيقاظ يفرح قلبي بنفس النغمة", the sentence is confusing and the message is incomprehensible. In terms of context, in rendering the meaning of the word "يؤثر" in the first literary text example, we can notice that MT did not rely on the context of the text, but instead it relied on the word phonetics where it was understood as “influence”. Another important finding arose from the comparison is that human translation was significantly more elaborate at sentence level. This may influence comprehensibility especially if the reader is unfamiliar with the content of the text as it is shown in the selected passage from Nizar Qabban’s poem “this is Damascus”, text (4).

Furthermore, human translation was more accurate than Google because the meaning of words, phrases, sentences was accurately transferred into the target language, and this can be seen in all chosen technical and literary texts. The technical and literary terms were accurately translated, such as “انزع الأرض”, in text (1) of literary texts, was translated successfully as “walking alone with great strides”. Many other examples may also show the human translation’s quality, such as, “businesslike” into "عملية", “cytology” into "تحليل خلوي", and “those they fail to recognize, they attack” into "و تهاجم الخلايا التي لا تتعرف عليهم" that was wrongly translated by Google as "أولئك الذين فشلوا في التعرف عليهم، يهاجمون". Also, the flow of information in both text types was more natural and comprehensible, and when it comes to coherence and cohesion, the translations of human were better than the translations of Google.

Ultimately, HT has higher pros than Google translation. This means that the quality of HT is better than Google translation in terms of accuracy, acceptability and readability. In this case, the quality of human translation is reflected by the quality of translations that are made in the chosen texts. However, we noticed also that Google translation is not always inaccurate and/or unacceptable. In the sample of the last literary text, for instance, the MT

succeeded in translating the Arabic source text grammatically, lexically and semantically. Only few words have shown the differences between the two translations, but the general message or meaning of the original text is achieved in both translations. This can lead us to the conclusion that we can rely on the machine translation in rendering certain text types; however, in translating other types of texts, especially those with complex sentence structures and semantic difficulties, the human translation is more adequate and accurate.

### **3.4 Conclusion**

In this practical part of the dissertation, we mainly made a comparison between human and machine translations of samples from literary and technical texts. Through this scrutinized comparison, we came up with the conclusion that machine (google) translation can be very helpful since it can provide fast services by translating lots of hundreds of texts quickly, yet, it can make many grammatical, lexical and semantic mistakes, especially with some text types of specialized language, such as medical and legal texts. Some mistakes in the translation of machine can lead to many problems and dangerous situations. Thus, eliminating human translators and fully relying on machine translation is not the best choice always. Human translation cannot be replaced by MT easily, at least for the current time.



## **General Conclusion**

## Conclusion

In this dissertation, we attempted to explore, explain, and highlight the differences between Human and Machine translation in selected technical and literary texts. We divided this paper into two parts: the theoretical and the practical part. These parts were divided between two chapters as a theoretical part, and another chapter that was dedicated to the practical part. We commenced the first chapter by defining Machine Translation according to different translators and/or linguists; namely, we provided definitions from the stand point of both translators and linguists. Then, we shed light on the history of Machine Translation and its developments over time. After that, we identified the three main types of the machine translation which are: Rule-based machine translation, Statistical machine translation, and the last one is Neural machine translation. Next, we tried to compare and highlights the differences between machine translation and translation memory, and also between machine translation and human translation. At last, we identified the aims and the significance of machine translation. For the second theoretical chapter, we dedicate it to the translation of both literary and technical texts. We started by providing definitions to both literary text and technical text. Then, we explained the technical translation as well as the literary translation, and we highlighted the difficulties of both types of translations when translating the literary and technical texts. Lastly, we started with our practical part. In this part of dissertation, our aim was mainly to measure the degree of success of machine translation in translating literary and technical texts as opposed to the translation of human, and to discover to what extent it may approach the quality and accuracy of the human translation. In this respect, we gathered 12 passages of texts ranging from technical texts to literary ones in their original language, followed by their both human and machine translations. We conducted our analysis through a comparison between the human and the machine (google) translations of those selected texts

at three different levels, semantic, lexical and grammatical. At last, we discussed the findings of our comparison between the two types of translations, google and human translations, and in our case, we discovered several differences between the two translations. Many errors were detected from the translations of Google to those selected texts in terms of grammar, structure, lexis, semantics, and so on. As opposed to the translations of human that were more accurate, well structured and semantically coherent. The translation of Google was less accurate because of its reliance on the literal translation and on the structures of the source text. As a result, the sentences seemed unnatural, incoherent and unlinked to each other, the translation of literary and technical terms in most of the cases did not give the exact or close lexical equivalents of the source text, and the target texts in general contain lots of semantic ambiguity. However, the Google translation succeeded in rendering some of the texts. Thus, we expect the quality of machine translation systems to improve in the near future due to the technological developments.

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## الملخص

### ملخص المذكرة

#### المقدمة

كثيرة هي التعريفات التي تتطرق إلى حقيقة الترجمة الآلية ، لكونها ليست مجرد استبدال للكلمات من اللغة الأم إلى لغات أخرى . لذلك يطمح العديد من العلماء في مجال الحاسوب إلى جعلها مثل الذكاء البشري ، مما أدى ذلك حسب رأي الباحثين إلى اعتباره تحديا علميا كبيرا كأداة مساعدة لتسهيل في عملية الترجمة من العربية و إليها . يمكن تعريف الترجمة الآلية ، على أنها استبدال كلمات بلغة معينة إلى لغة أخرى، حيث أن الجانب الرئيسي لها يعتمد على ترجمة معاني الكلمات في مفردات اللغة المراد الترجمة منها ( اللغة الأصلية ) ، ونقل المعنى للغة المراد الترجمة إليها ( اللغة الهدف ) .

#### أهداف الدراسة

الهدف من هذا البحث هو تسليط الضوء على الترجمة الآلية من خلال تحديد إيجابياتها و سلبياتها، بالإضافة إلى إعطاء صورة واضحة عن الفروقات المتواجدة بين الترجمة الآلية و البشرية.

#### المنهجية

نظرا لطبيعة موضوع الدراسة، إعتد الباحث في موضوعه على المنهج الوصفي.

#### التساؤلات

يهدف هذا البحث إلى الإجابة على التساؤل التالي:

- إلى أي مدى يمكن أن تصل دقة الترجمة الآلية دقة الترجمة البشرية؟
- ماهي حدود أو سلبيات الترجمة الآلية في ترجمة النصوص الأدبية و التقنية؟.
- إلى أي مدى تختلف فيه الترجمات الآلية و البشرية في القواعد، النحو أو الكلمات الدلالية في النصوص الأدبية و التقنية؟.

#### الفرضيات

للإجابة على هذا التساؤل المطروح سابقا تم إقتراح الفرضيات الآتية:

- الترجمة الحرفية و نقص الدقة قد يكونا السبب الرئيسي في سلبيات الترجمة الآلية،
- ربما إختلاف النصوص و ترجمتها يعود لدرجة الإختلاف الموجود بين الترجمة الآلية و الترجمة البشرية.

## خطة البحث

تنقسم المذكرة إلى جزئين، الجزء النظري والجزء التطبيقي. يحتوي الجانب النظري على فصلين أساسيين، الفصل الأول يعالج معلومات عامة حول الترجمة الآلية، أما الفصل الثاني فإنه يتعلق بترجمة النصوص التقنية والأدبية. أما بالنسبة للجانب التطبيقي، فإن الباحث يتطرق فيه إلى سلبيات وإيجابيات الترجمة الآلية في نصوص أدبية و تقنية مختارة بعناية. بعد هذا، ينتقل الباحث إلى عنصر المقارنة بين الترجمة البشرية والترجمة الآلية من خلال ترجمة النصوص الأدبية و تقنية، بعدها تناقش النتائج المتحصل عليها.

## محتوى الفصلين

فكرة الترجمة الآلية تعود إلى منتصف الثلاثينات، كوسيلة مساعدة للبشر . حيث لاقت هذه الفكرة نجاحا هائلا وتمويلا ماليا كبيرا لأبحاث الترجمة الآلية، وكل ما يتعلق بأية مشكلة في الترجمة . طور كل من العالم الروسي بيتر ترونسكي والعالم الرياضي وورن ويفر ، وأندرو بوث الجانب اللغوي للاله وحتى القواعد وغيرها لسد المشاكل التي يمكن أن تطرأ عن الترجمة من أجل إنتاج ترجمة عالية الجودة ، غير أن التطور الحقيقي لهاته الفكرة تباطأ كثيرا ، حيث توصل تقرير الباك ( ALPAC ) في الستينات الى أن البحث العشر سنوات قد خيبت الامال، وانخفض التمويل المالي بدرجة كبيرة كما شهدت الآلة سلبيات عديدة: أكثر تكلفة، أقل دقة وأقل تقدما .

مع أواخر الثمانينات و بداية التسعينات ، شهدت القوة الحاسوبية تطورا هائلا ، مما أدى إلى اهتمام العديد من العلماء والشركات لاستعماله ، استطاع علماء اللسانيات الحاسوبية إلى تطوير أنظمة تحمل مخزون هائل من المدخلات التي يمكن ترجمتها ليا وهي كالاتي : الترجمة الآلية المستندة إلى المعاجم والقواعد ؛ وقد تم فيها ادخال قواعد صرفية ونحوية ودلالية على الترجمة ،بغض النظر عن صعوبة مزجهم بطريقة علمية ، غير أن هذا الأمر تحقق من خلال ترجمة الجمل القصيرة ذات التركيب البسيط .

النوع الثاني يتمثل في الترجمة الآلية الاحصائية ؛ يتميز هذا النوع بقدرته على تعلم ترجمة العبارات وليس الكلمات المفردة فقط . بالاطافة إلى جمع عدة موارد معرفية واستخدامها لتحليل الجملة أو العبارة المترجمة . أما اخر نوع فيسمى الترجمة الآلية العصبية ؛ شهد هذا النوع نشاطا في الاونة الأخيرة حيث تجري خلاله الترجمة الآلية بشكل مختلف من خلال استخدام نموذج الشبكة العصبية الاصطناعية لتدريب هذا النموذج على جمع أكبر قدر من الإلتقان في الترجمة .

الفرق بين الترجمة البشرية والآلية هي أن البشرية يقوم بها مترجم متخصص لترجمة مجموعة من النصوص كالمقالات والعبارات وغيرها . ويعتمد ذلك على خبرته في مجال الترجمة واتقانه ودرايته باللغات . يكون النص المترجم مطابقا مع النص في اللغة الأصلية التي تمت الترجمة منها إلى لغة ما . أما الترجمة الآلية فتتم باستخدام برامج وأنظمة مخصصة

لإنشاء كتلة بيانات متعلقة بالترجمة الآلية .

بالرغم من هاته الفروقات غير أن كل منهما يستعين بالآخر أي أن أحدهما مكمل للآخر وذلك لانتاج جودة عالية في ترجمة نص ما. وفي الأخير يمكننا القول أن مزايا الترجمة الآلية توفر التكلفة والجهد والوقت، فهي تمكننا من ترجمة النصوص بشكل فوري وهذا ما يحتاجه العالم الآن .

أما الفصل الثاني فقد تناول نوعين أساسيين من النصوص في مجال الترجمة، النص التقني وترجمته والنص الأدبي و ترجمته. بشكل عام، الترجمة التقنية هي تحويل النصوص العلمية والتقنية واستخدام مصطلحات خاصة متعلقة بالمجال العلمي أو التقني. والنصوص التقنية هنا يقصد بها غالبا أنها نصوص غرضها نقل معلومات تعليمية أو إرشادية في مجالات مختلفة مثل التكنولوجيا، الطب أو الهندسة، إلى جانب تميز هاته النصوص بافتقارها إلى الأسلوب الأدبي التعبيري. يتطلب ترجمة النصوص التقنية إلى العمل الجاد والكثير من المعرفة والخبرة المكتسبة بحيث يتوجب على المترجم أن ينقل ليس المعنى الدقيق للنصوص فقط بل إلى الأسلوب أيضا، كما تتطلب استخدام دقيق للمصطلحات دون الإخلال بالمعنى العام للرسالة.

أما النوع الثاني فيتمثل في النصوص الأدبية. النصوص الأدبية هي نصوص إنشائية تعالج موضوعا معينا. تتميز ترجمة هذا النوع من النصوص بالصعوبة في ترجمة المفردات والعبارات، مع الحفاظ على مكونات وعناصر النص الأدبي، من تراكيب ومواطن جمال والتشبيهات للمحافظة على القيمة النصية الأدبية. لهذا فإن الترجمة الأدبية هي مهمة شاقة وذات مستوى صعب في التعامل معها وذلك لأنها تهتم بنقل لغة ما مع التركيز على التركيب الأصلي لها. أما بالنسبة للمترجم، فعليه أن يكون ملما بجميع القواعد النحوية الخاصة باللغتين، أن يفهم المضمون جيدا لنقل المشاعر والأحاسيس إلى القارئ بطريقة صحيحة والإبقاء على الصور البلاغية للحصول على صورة متطابقة للنص الأصلي.

### محتوى الجانب التطبيقي

بما أننا خصصنا الفصلين الأول والثاني للجانب النظري وجدنا أنه من المناسب أن نخصص فصلا آخر للجانب التطبيقي الذي لا يقل أهمية عن سابقه. هذا الفصل الذي سيتيح لنا تطبيق المكتسبات النظرية على أرض الواقع فقمنا باختيار بعض النصوص التي تنوعت بين الأدبية (بأنواعها) والتقنية (بأنواعها) واخترنا بعض الاجتهادات والترجمات التي قام بها مترجمون أشخاص بينما أخذنا ذات النصوص في لغتها الأم وترجمناها آليا لكي يتسنى لنا مقارنة الترجمات باختلافاتها، تحليلها، تبيان النقائص ونقاط الضعف وكذا نقاط الاختلاف والتشابه بين ترجمة الإنسان والترجمة الآلية. كما أننا وضعنا خط تحت العبارات التي لم تفلح الترجمة الآلية في ترجمتها بشكل صحيح.

ومن خلال مثال النص العلمي رقم 2 يمكن ملاحظة وتصيّد جملة من الأخطاء التي ارتكبتها الترجمة الآلية والتي أخذت بالمعنى بشكل

كبير، والتي أجبرتنا بدورها الأمانة الترجمة على تسليط الضوء عليها وتحليلها ليتسنى لنا وللقارئ فهم طبيعتها. أولاً نجد أن ترجمة "Sent me" إلى "أرسلني" في السياق الموضح في النص الثاني لم يكن موفقاً بل يعتبر خطأ في اختيار العبارة "word choice"، أي خطأ على المستوى المعجمي.

إضافة إلى ترجمة كلمة "my groin" إلى "فخذي" وهو خطأ في اختيار الكلمة، (Lexical level)

مقارنة بالترجمة البشرية التي نجحت في اختيار الكلمة المناسبة مترجمة ذات الكلمة بـ "مفصل الفخذ".

كما اقتترف المترجم الآلي خطأ آخر لا يقل فداحة من خلال ترجمته لكلمة "Businesslike" إلى "الأعمال" أين تبدو العبارة في غير محلها تماماً الأمر الذي غير المعنى المراد به من العبارة، مقارنة بالترجمة البشرية التي ترجمت العبارة إلى "عملية"، "بنبرة عملية" كترجمة لـ "Business like tone".

وقد جاءت كلمة "عملية" واصفة للكلمة التي سبقتها. ولا يمكننا إغلاق ملف أخطاء الترجمة الآلية التي مارستها على هذا النص دون أن نشير إلى عدم نجاحها في ترجمة ونقل كلمة "Cytology" كما يجب لأن العبارة والتي ترجمتها الآلة "بعلم الخلايا" لا تحمل المعنى العام الذب نقلته الترجمة الآلية بقدر حملها لمعنى خاص كما ترجمته الترجمة البشرية بعبارة "تحليل خلوي"، فهذا السياق استوجب التخصيص لا التعميم وهذا يدخل ضمن إطار الأخطاء على المستوى المعجمي والدلالي على حد سواء.

أما في النص الأدبي من القصة القصيرة للكاتب طيب صالح فنجد أن الترجمة الآلية لم تفجح في ترجمة بعض العبارات المهمة لتماسك، وتناسق المعنى. فمثلاً عبارة "أذرع الأرض مثله في خطوات واسعة" فترجمتها الآلة على هذا النحو:

«Straddling the arms of the earth at great strides»

وطبعاً هي ترجمة غير موفقة لكون العبارة في اللغة العربية وصفت حركة المشي "أذرع" غير أن المعنى الذي نقلته الترجمة الآلية يشير إلى الجزء العلوي من جسد الإنسان أي منطقة الذراع، إضافة إلى ترجمة "يؤثرني" أي بمعنى "يفضلني" إلى فعل "Influence".

لذا نلاحظ هنا خطئين واضحين الأول على "The lexical level" وكذلك الترجمة الآلية أخطأت في ترجمة كلمة "مواعيد صلاته" فترجمتها إلى "prayers"، إضافة إلى كلمة "مصلاة" التي ترجمتها بعبارة "prayer"، كذلك عكس الترجمة البشرية التي فرق بين "times for his prayer" وبين عبارة "prayer-rug"، وهذا الخطأ يكون على المستوى المعجمي والدلالي وأخيراً وليس آخراً نجد عبارة "يطرب له" ترجمت ترجمة غير موفقة ولم تنقل المعنى المراد كما نقلته الترجمة البشرية إلى "he was moved"، وبالتالي يدخل هذا الخطأ ضمن الأخطاء النحوية والمعجمية على حد سواء.

### الخاتمة

في هذه المذكرة قد قمنا بتقسيم العمل إلى جزئين نظري وتطبيقي، أين خصصنا الفصل الأول للتعريفات وقمنا بتعريف الترجمة الآلية و بمقارنتها بترجمة الإنسان أما الفصل الثاني فقد تناول تعريف النصين الأدبي و التقني و الاختلافات التي تكمن بينهما و كذا الصعوبات التي قد يواجهها المترجم الذي يقدم على ترجمة مثل هذه النصوص. أما الفصل الثالث فقد خصصناه للجانب التطبيقي أين قمنا باختيار مجموعة من النصوص في لغتها الأصلية و ترجمناها آليا و اخترنا ذات النصوص مترجمة من قبل أشخاص لكي يتسنى لنا تحليل و مناقشة هذه النصوص و كذا معرفة النقائص كما قمنا بوضع خط تحت العبارات التي عجزت الآلة عن ترجمتها بطريقة صحيحة و عادة ما تفشل الآلة في ترجمة بعض الأنواع من النصوص و على رأسها النص الأدبي و القانوني بصفة خاصة و الشيء الذي قد يترتب عنه مشاكل قانونية طبعاً و نستنتج من كل ما قيل أن الترجمة الآلية قد تكون جد مفيدة في عديد الأحيان و في ترجمة بعض أنواع النصوص لكنها قد تفشل فشلاً ذريعاً في ترجمة غيرها و هنا تكمن أهمية ترجمة الإنسان التي لا غنى عنها.

الجمهورية الجزائرية الديمقراطية الشعبية  
وزارة التعليم العالي والبحث العلمي

جامعة قاصدي مرباح ورقلة

كلية الآداب واللغات

كلية اللغة الإنجليزية و آدابها



مذكرة تخرج ماستر أكاديمي

ميدان: الآداب و اللغات

تخصص: ترجمة

## استكشاف الترجمة الآلية

مقارنة بين الترجمة الآلية وترجمة الانسان في نصوص تقنية  
وأدبية

من إعداد:

حابة المهدي - وسطاني ثورية

تقييم اللجنة المكونة من

جامعة قاصدي مرباح ورقلة	رئيسا	سعدون فريدة
جامعة قاصدي مرباح ورقلة	مشرفا	مسلوب دليلة
جامعة قاصدي مرباح ورقلة	مناقشا	زغار حمزة

السنة الدراسية:

2021/2022