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Research Article

Cognitive Evaluation of Post Editing Translation Courses Productivity and Adaptive Strategies

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ABSTRACT

The filed of translation and the unlimited uses of machine translation has become a field of great importance. Global technological advancements have facilitated access to texts on a variety of topics written in multiple languages. To meet the great need for communication between peoples and the contact between people in different languages, many translation programs and technologies have been introduced by specialized companies in the field. These technologies combine translation memories and machine translation, along with specialized translators with high competencies to facilitate communication between people of different languages during the post-editing phase. This research examines the skills required by specialized translators and post-translation editors to complete the translation process, the skills required by translation and post- editors , and the possibility of developing specialized and professional programs and courses that can be taught at universities and specialized institutes in translation. This paper aims to design professional courses for translation students during their training as translators. The paper outline the processes of post-editing has matured approved as a practice and adopts an encompassing understanding of post-editing tasks covering both the theoretical and practical aspects of translation specialization.

Keywords: Post Editing, Machine Translation, Memory Translation, Arabic Language , Language Processing.

Introduction

In the field of Translation, the conversion of a source file into a target file has seen a phenomenal change in the last several decades and this is due to the high level of automation in translation (Temizoz, 2013). Post-editing is a very important part of the translation cycle, a concept that was in existence from the mid-1950 when machine translation was not producing perfect output which had to be edited manually. Post editing is a process that corrects the output to make the content better than the output the MT software has produced. This process is similar to the revision of translations done by human translators. The 'Post Editor' edits the content and modifies the already translated text which may have some errors such as the wrong punctuation marks, inappropriate annotations, incorrect meanings or numerals; all errors are thoroughly checked and appropriate changes are done by the post editor (Allen, 2003; Carl et al, 2011). Most of the MT software give the same error in the output for the same input (Groves and Schmidtke, 2009) and if a software is used only for getting a gist of the text then the post editor's job is to make appropriate corrections where necessary. The Post Editor must have the same level of competency a translator has (Schütz, 2008). A number of studies have been conducted to give a definition for the process involved in post-editing (Krings, 2001 and O'Brien, 2006a and 2006b)

In a study by Aikawa et al (2007) shows the relationship of controlled language, machine translation and post editing. This paper proves that the effort put in by the post editors can be reduced if controlled language is used as the quality of MT will improve and so the overall productivity of post editing will be better. This study shows that some of the rules of CL if implemented can have a very good effect on the MT in various languages and so the difficulty in post editing becomes less. The CL rules applied in this study are limited to this specific research and so it cannot be assumed that for all MT it can be of use.

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MT's quality has improved over the decades but the quality available currently needs to be improved further in order to publish the outputs except in cases where controlled languages are used with MT systems that are dedicated only for a few specific domains (Koponen, 2016). In majority of translation work the machine translation is considered as a raw set of data to be edited by human translators. Studies show the demand for the use of post-editing tools has grown and continues to grow (O'Brien, 2002). Many workshops, publications and entries in journals have echoed the interest that translators show in post-editing MT.

The translators' productivity has also improved over the years due to the better quality of MT available as compared to manual translation (Plitt and Masselot 2010). When MT output is of poor quality it does not help in improving the translators' productivity and so the effort put in by the PE are expected to be within acceptable range which is measured (De Sousa, Aziz and Specia, 2011). The poor machine translation quality are edited by post editors and the basic reason for measuring the effort put in by post editors is to enable the companies to quote the correct price for the task done by the post editors (Arenas, 2013).

The usage of MT and post editing varies from language pair to language pair (Senez, 1998) and similarly the rate for effort in post editing also varies based on the language pairs (Kopenen, 2016). Languages that do not come under the same family are difficult to be translated into the target language as they have rules, scripts and grammar that are not present in the source language. For example English and Arabic do not come under the same family and so translation is difficult whether it is English to Arabic or vice versa (Farghaly and Shaalan, 2009).

Definitions

Veale and Way (1997) state that the task of the post editors can be made easier if the machine translation software can lessen the number of errors while translating the source text into target text.A comprehensive definition for Post-Editing has been given in the Draft of European Standard for Translation Services (2004) as "examination and correction of the text resulting from an automatic or semi-automatic machine system (machine translation, translation memory) to ensure that it complies with the natural laws of grammar, punctuation, spelling, and meaning, etc"

Pym (2011) defines post-editing as the " term for the process of making corrections or amendments to automatically generated text, notably machine-translation output." In this paper Pym mentions that post editing is the opposite of pre-editing. According to Pym only in automated translation situations can the two terms be used.

Types of Post-Editing

Laurean (1984) declares that there are two types of post editing namely the conventional post editing and the rapid post editing. In the first type the contents of the Target text must be as similar to the source as possible and in the latter type the style is not as important as the language in the Target text.Temizöz (2013) states the rapid post editing as "light post editing or minimal post editing". The main condition in this category is that content of the target text should be comprehensible for the reader. According to Temizöz (2013) this category is used in translating emails, documents that have short life or translation of messages that are to be read by very close groups of people. The time spent on such translation is less and so the light post editing or rapid post editing is executed and the output not stored in the memory permanently. The rapid post editing is most suitable in situations where there is an urgency to translate the text that need not be published, or the customer is ready to take the risk of having a low quality translation (Senez, 1998). Tremos (2013) states that in the case of full post editing the intervention of the human translators and post editors are mandatory as only then the output will have a very good quality. The target text can then be stored in MT or TM for future reference or use by translators. This process helps in reducing the time spent on translation and also increases the accuracy of the translation.

Post Editing Categories

Inbound translation

Allen (2003) had clearly distinguished the Post Editing into two types namely inbound and outbound Post Editing. The Inbound post editing consisted of gisting done by the MT and any errors that is based on wrong grammar is acceptable if the Target Text can be read by the user and the meaning is not distorted. In the Inbound post editing

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there is another distinction made by Allen (2003) called the Rapid Post Editing (RPE) which includes a minimal editing in which the obvious errors are eliminated. This makes the output comprehensible for the reader but here the style of the text is not changed. This kind of Post Editing was accepted by the European Commission's Post Editing services (Svěrák, 2015).

Outbound Translation

In the case of Outbound translation there are three categories (Martinez, 2003) namely minimal post editing, no post editing and full post editing, In the first type the draft of the text is edited with minimal changes as in the case of nay manuals or technical documents so that the final text for the reader is comprehensible. This type is used only for internal purposes of disseminating information in large corporate. The second type which does not have any post editing done on the text is similar to the original version of outputs the MT system of the 1950s and 1960s. In very few situations this can be used like in the case of weather forecasts (Svěrák, 2015).

From the above given categories it is clear that in two areas of Post editing human intervention is not required namely the gisting which is an Inbound post editing category and in the 100% MT in Outbound post editing.

Previous research in Post-Editing

Reading comprehension study by Orr and Small (1967) was the first study in the field of post editing. This study made the participants read the MT output of text that consisted of science terminologies as the translation was of scientific texts. This experiment measured the errors, the time taken for translation but it did not focus on the linguistic features of the task. The results of the study show that manual translation was more time consuming than translation of post edited texts.Arenas (2008) states that the translation memory that contains small chunks of machine translated text are considered as fuzzy matches. Participants of this study consisted of eight professional translators who translated texts that were new, machine translated texts and also texts form translation memory. A post editing tool was used for all the texts but the translators were not aware of the types of texts they had received for translation. The findings of this study show that the machine translated texts were having the best quality and higher productivity than the other two sets of texts. This study also shows that the experience of the translator also plays an important role in both the rate of productivity and quality of translation.

The increase in productivity was reported in an empirical study by Plitt and Masselot (2010) in a two day test that evaluated the increase in productivity of both statistical MT post-editing and traditional translation. In this study 12 translators participated. The text was translated from English into four languages namely French, Italian, German and Spanish. Though the productivity increase was significantly higher there were variations among the individual translators who participated in this study.

In a study by Laubli et al (2013) it was observed that the time taken by the traditional methods of translation was reduced to a considerable level when post editing was done on the output. The paper also suggests that efficiency of the post editor must be tested in an environment that is realistic and also the post editors must be given access to translational aids for increase in spead and productivity.Screen (2017) stated in his research study that the advantages of editing texts that were machine translated and texts that were output by Translation Memory shows that the translation speed was higher in the texts that were machine translated. The study clearly shows that the speed of translation process increased when the post editing was done on texts that were machine translated. The grammar, style and fidelity of translation were not affected and the quality of translation improved. The findings also did not show similarities between the styles used in translation.

Skills required for a Post Editor

Rico Pérez and Torrejón (2012) have identified language skill as one of the most essential skills required for a translator who is working as a post editor. In this study it has been found that among the several skills required for a Post Editor linguistic skills are very important which includes communicative skills as well as textual skills at least in two languages. Apart from the Post editor must also possess sufficient subject knowledge. The study clearly suggests the importance of language as the main requirement for a Post editor.

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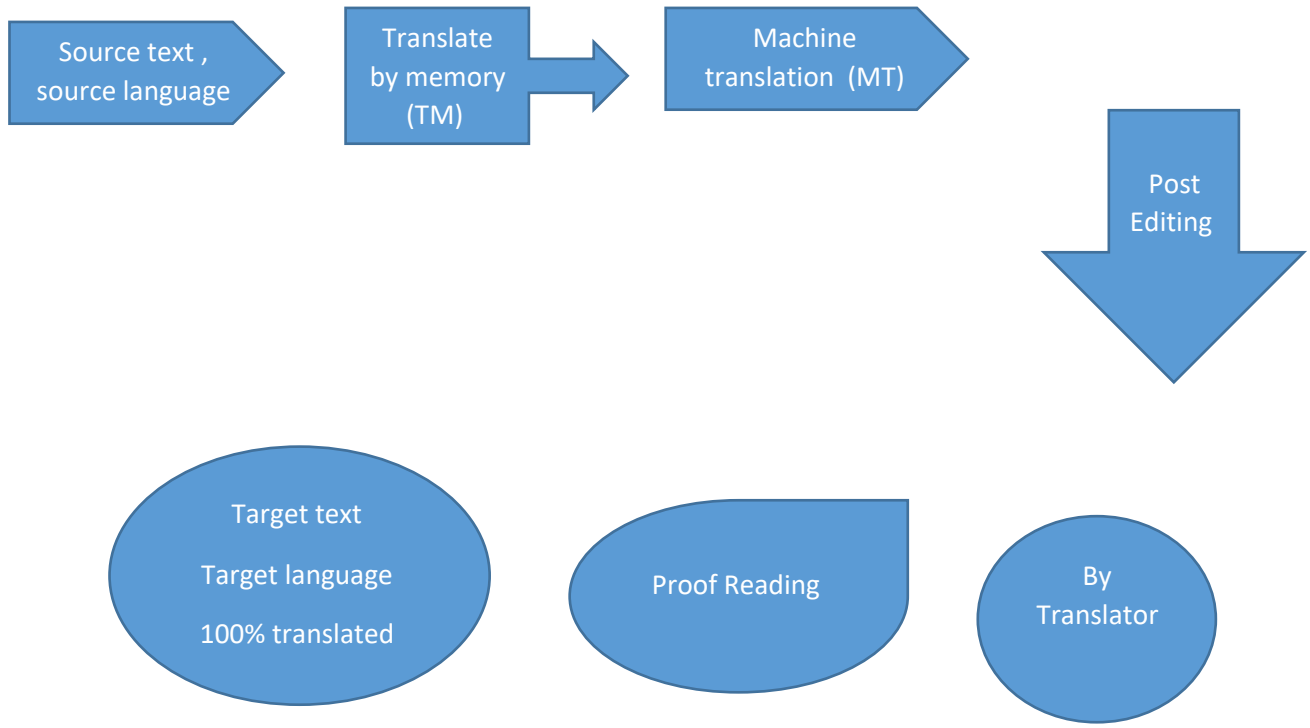
Pym's (2013) study observes that the concept of source and target language concept has been replaced by the "start text" which are texts that are available in the translation memories, technical terms, text translated by machine translation software and glossaries which need to be translated into a specific language as per the requirements of the end user. For this the skills suggested are divided into three categories namely learning to learn, learning to trust and mistrust data, and learning to revise. Learning to learn includes the capacity of the translator to quickly grasp from online resources, estimate how suitable a given tool is for the task on hand, learning from colleagues the solution for a current problem and have skills to assess the process of the task using the tool. Learning to trust or mistrust data (Pym, 2013) signifies the capacity of the translator to either use or not the available data based on the individual discretion of the translator. Finally the category that suggests learning to revise includes correction errors such as punctuation marks, style and also learning to review work with translation professionals and subject experts.

In the language industry machine translation is a common feature that translators come across often. Machine translation is part of the curriculum in many programs that teach translation as there is a very big demand for it. Mellinger (2017) suggests that to become a professional post editor machine translation must be part of the curriculum in many courses and should not be isolated in a single translation program or course alone. The study (Mellinger, 2017) also shows that the students must be trained for the various needs of the market such as understanding, terminologies, post editing and translation practice.

The translators' expertise in more than two languages is developed due to the experience they gain from their translation work. However with the knowledge of technology the translators are better equipped to handle the task given to them.

Workflow in Post editing



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1-Translation and editing by MT system

The workflow in Post Editing consists of translation by the MT software, editing the raw machine translated text by human translators or editors, and in the last step the proof reading is a task done by a human editor (Doherty and Gaspari, 2013). In this system the Translation Memory (TM) and Machine Translation (MT) are not the same but are complementary to each other and can be used to speed up the workflowt. Translators and editors help in the management of the MT and they decide on the right choice of MT software. The proof reading is done by a different individual who is the Editor. It is easier to identify the errors of the MT while human errors are not very easily identifiable and so it is more difficult to set it right. So an experienced proof reader must be given the task for editing the material that is translated and edited by human translators.

Teaching modules for Post Editing

Some of the key areas that should be taught in a Post Editing course are MT, Editing skills, Controlled Language, basic programming skills, Text linguistic skills.

MT (Machine Translation)

An overview of the History and development of MT has to be part of the course as this background helps the students to understand the basics of MT. MT software should be introduced for the students to have practical knowledge and experience of a Machine translator. According to O'Brien (2002) "Knowledge of MT technology in general would go a long way towards helping the post-editor understand what is going on in the so-called "black-box" and why certain errors occur consistently."

Koponen (2015) states the importance of acquiring the knowledge of machine translation as MT is useful in various fields. This study proposes the planning and development of a course in post editing where the study of MT is a very important and significant module.

MT can be Rule based (e,g – Systran, Apertium) which works completely on linguistic rules and dictionaries. This system is used in translating technical manuals, software manual etc,. This system is not available for all languages. As the software is very expensive the users of this type of MT are limited. The second type of MT is statistical which consists of a huge collection of bilingual texts covering all languages. The quality of translation is not always good and so it is not predictable to be relied upon always. The third type of MT is called hybrid. The output in this type because both rule based and statistical MT's concepts. The Students of MT and Post Editing must be taught all the three types of MT and the course must include both practical and theory sessions for getting the experience and knowledge of MT.

Editing Skills

Any Post Editing course must train students in editing skills. One of the basic skills a Post Editor must have is word processing skill. The course must also help the aspirants to increase the speed of editing by providing practical sessions that help in increasing the speed of editing. Some of the editing skills that can be taught are

a. The Ability of making the corrections directly on screen
b. Ability to understand the limitations of the MT that the student is trained on
c. Reasons for the errors made by the MT used in the course
d. Repeated sessions for improving the decision making capacity of the student
e. Basic theoretical knowledge of the technology used in the MT and its advantages compared to the manual human translation.

This module consists of practical sessions mainly while a small amount of time can be dedicated for the theoretical knowledge.

Controlled language

In the translation field 'controlled language' is used for translating documents that are technical in nature. Here the language used is less complex as the grammar and style are not given importance. If the source text is input in a controlled language the translation is not difficult. If the source text has small simple sentences then translation is

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made very easy. If the sentences need repetition then it should be repeated which makes more than one simple sentence. If the simple sentences have simple grammar this helps the user to translate this faster. Sentences in active form using only noun and not any pronoun can be easily translated.

Basic programming skills

In regard to the basic programming skill that are of so much importance for post-editors, Vasconcellos (1986a:136) stresses the use of macros which is regarded as an essential skill for post- editors. According to Vasconcellos , a post-editor is an ideal candidate for writing macros to automatically clean-up texts since s/he has extensive experience of commonly occurring errors. These macros are considered to be the first step towards the concept of an automatic post-editing tool, as suggested by Ryan (1988), Knight and Chander (1994), Allen and Hogan (2000). If the post-editor is familiar with the basic programming skill, he/she will have the ability of developing his or her own programme for automatically detecting and correcting various errors for specific language pairs, MT systems and text types.

Text linguistic skills

Vasconcellos (1986b) stresses the importance of knowledge of theme and rheme and other language-specific text type norms for post editing. Being familiar with text linguistic skills is of so much importance for post editors. This knowledge has to be applied for post-editing and programming macros and automatic post-editing modules.

Proposed outline for a course module in post-editing

In the previous section, some of the key areas that should be taught in a Post Editing course have been highlighted. The key areas include MT, Editing skills, Controlled Language, basic programming skills and Advanced Text Linguistics.

In this section, outlines of the course which addresses the key areas will be proposed.

The module in post-editing is classified into two, with a special focus on the theoretical part in the first half and a focus on the practical part in the second half.

The Theoretical part

The theoretical part will include the following points:

1. **Introduction to Machine Translation**
   The Introduction to Machine Translation should cover:
   a) The history of MT
   b) MT system types
   c) Description of commercial MT systems
   d) Evaluation methodologies
   e) The state of the art, including integration with translation memory tools,.
   f) Future prospects.
2. **Introduction to post-editing skills**
   This section covers the following:
   a) The concept of post-editing
   b) The need for post-editing
   c) How is post editing different from translation and revision,
   d) The various levels of post-editing,
   e) Identifying the user requirements
   f) The technology which is needed for post editing,
   g) Classifying typical post-editing errors.

3. **Introduction to Controlled Language**
   This section covers the following:
   a) A history of Controlled Language,

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b)A description of the different CL tools,
c) Evaluation methodologies for CL tools
*d)*current state of the art
e) Integration with authoring and MT tools,
f) Future prospects

4. Basic Programming Skills

This section introduces the following:

a) The basics of programming
b) Macro programming
c) Programming language suitable for Natural Language Processing, for example *Perl*.

5. **Text linguistic skills**

This part covers:

a) The basic linguistic skills
b) The standards of textuality
c) Thetext type classification
d) The use of corpus linguistics and corpus analysis tools for analysing text types.

Practical part:

Regarding the practical part of the key areas, the following should be part and parcel of the practical component:

1. **Introduction to Machine Translation**

In this section ,the students should be trained to do the following:

a) Practise the Commercially-available MT systems .T
b) Submit different texts for translation to the MT system
c) Analyse and compare the results under different system settings
d) Explore the pros and cons of a MT system's integration with a translation memory tool.

2. Introduction to post-editing skills

It is assumed that post-editing is a practical skill and teaching this important skill aims to let the students acquire the "comfort" factor Vasconcellos talks about *before* being recruited, practical experience of post-editing is considered to be a major component in the course. According to Vasconcellos (1986a:145), a post-editor at PAHO (the Pan-American Health Organisation) post-edits 100, 000 words, or almost one full working month, before that level of comfort is reached. While it may not be possible for a student to attain this goal, especially considering the workload from the theoretical component of a programme.

In this section, the student should be trained to do the following:

a) Practising post-editing both within and outside course hours.
b) Post editing of various text types from many MT systems
c) Post-editing into multiple target languages.
d) Practising the different "levels" of post-editing.

3. Introduction to Controlled Language

Practical experience of controlled language tools should be gained according to the following guidelines:

a) Checking and editing texts in the source language using a CL tool
b) Submitting the controlled and uncontrolled texts to a number of MT systems.
c) Post-editing of both versions and showing the pros and cons of controlled authoring for machine translation.

4. **Basic Programming Skills**

In this section, the students should acquire practical programming skills by doing the following:

a) Writing macros to automatically apply common changes in target texts.

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b) Applying the programming language skills learned in the theoretical component of the course by designing a rudimentary automatic post-editing application.

5. **Text linguistic skills**

The students should gain practical experience on:

a)corpus analysis by compiling parallel corpora, tagging them, and analysing them for specific text linguistic features such as theme/rheme structure, voice, tense, cohesive ties, etc. using corpus analysis software such as Wordsmith tools.

Conclusion

Recently, translation has witnessed significant and dramatic changes brought about by the advent of new technologies such as machine translation. The output of the MT has to be post edited by human beings and this process is called post editing .In this process, humans post edit machine-generated translation to come up with an acceptable final product. The post editors should be trained to tackle different terms such as translation, post editing and its types, post editing categories and the skill sets required for post editors .It is highly recommended that designing a post editing course is essential in order to be taught at the university level to produce professional post editors. For this purpose, this paper outlined a program that includes both the theoretical and practical aspects of the course.

conflict of interest

The author declare no conflict of interest

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