

EVALUATING THE ACCURACY OF GOOGLE TRANSLATE AND CHATGPT IN TRANSLATING WINDOWS 11 EDUCATION INSTALLATION GUI TEXTS TO INDONESIAN: AN APPLICATION OF KOPONEN'S ERROR CATEGORY

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ABSTRACT

Understanding computer systems in a foreign language can be challenging, leading users to rely on machine translation tools to overcome language barriers. However, the effectiveness of these tools varies, so it is crucial to assess their performance. This study aims to evaluate the translation accuracy of two popular machine translations, Google Translate and ChatGPT, by examining the errors they produce. The research uses Koponen's translation error category. The study focuses on translating the installation GUI texts of Windows 11 Education into Indonesian. The main objective is to determine the error categories and their distribution in the translations created by Google Translate and ChatGPT. The findings will help developers improve their translation algorithms and guide users in choosing the most appropriate translation system for specific situations, especially when dealing with computer systems. The research identified five error categories from six categories proposed by Koponen in the translations generated by Google Translate and ChatGPT. A total of 29 errors were found, distributed as follows: omitted concepts (17.24%), added concepts (24.13%), untranslated concepts (20.68%), mistranslated concepts (3.44%), and substituted concept (34.48%). In terms of relation error only one type is found, that is added participant. This study provides valuable insights into the performance of widely used machine translation tools in real-world situations, emphasizing areas for improvement to enhance their

accuracy and reliability, ultimately benefiting both developers and end-users.

Keywords: ChatGPT, Google Translate, Koponen, machine translation, translation accuracy.

INTRODUCTION

Language element in computer system sometimes hard to understand especially for those whose language are not the same nativity with the computer system. Here is the sample case, when our computer suddenly error and it throws several warnings or when the computer throws a notification in our screen. As default, most computer system uses English the language in which most of the software we are using daily is produced (Esselink, 2000). It is understandable that not all people understand English, moreover an English which uses specialized term in the field of computer. When that case occurs, of course send the computer to an expert is the best solution, but there are conditions where it is hard for us to meet an expert, in a lack of time or finance could be the best instance. During that mentioned case, what we usually rely is using a machine translation system. Nowadays we could find many machine translation systems scattered around websites which we could try and use for free, however the reliability of those systems is different from each other.

This research is conducted to analyze the error that produced by machine translation system in translating context from the field of computer. Two machine translation system are chosen for this research, one which popular since quite long time ago and one which currently gain a surge in popularity, sequentially Google Translate and ChatGPT. Because computer field is a very broad and involving many fields of expertise, it is not possible to analyze all context in the field of computer, so an example of context is taken. The taken context is during installation of Microsoft Windows an operating system which familiar for many of us now, more specifically the text that appear in the Graphical User Interface during the installation, a further limitation because Microsoft Windows already has several versions the version to be used in this research is Windows 11 Education which is the latest version of Windows and which author possesses a legal copy.

There are several preceding researches which is related with this research. A research by Cahyaningrum & Widiyantari (2018) title "Comparison of Translation Quality Between Google Translate, SDL

Free Translation and Tradukka in the Health Article Entitled ‘Vaginal Birth After Caesarean’” the research analyses the three translation engines technique and quality in translating the text which is in the field of medic. It is found from this research that Google Translate held the highest position in term of quality in translating the text, followed by Tradukka, and in the last position the SDL Free Translation. The research weigh heavily on the assessment of the questionnaire participants without deeply analyze the problem on the result of the translation. The present research will focus to analyze the error produced by the machine translation, by conducting this research the gap that previous research made can be filled, even if the field is different the data can still be an example of the importance of error analysis.

A research titled “Instagram Translate and Human Translation in the English Captions of Jokowi’s Account: An Analysis of Koponen’s Error Category” which was conducted by Putri & Setiajid in 2021. The research found that human translation is better in translating special terms and has more vocabulary and grammatical compared with Instagram’s machine translation. The previous research and the present research use same theory that is error category by Koponen (2010). What differentiate between the previous research and the present research are the object of analysis: first, the intention of Instagram machine translation is to translate a post of the users of Instagram which is to be shared to other people, in other way to say it is going to translate in other-users end not on the user who post the caption or text, while machine translation such as Google Translate and ChatGPT shows the result of translation directly to the user who post the data; second, the research by Putri & Setiajid not yet compare with other translation machines which is a gap to be filled by this research.

Benefit of this research is first for public, people may know what machine translation to be relied in context related with computer field. The data of this research hopefully can also be useful for the developers of ChatGPT and Google Translate to develop a better system in translating context in computer field.

METHOD

This research uses library method in collecting necessary information. According to George (2008) library research method is by identifying or locating sources that provide factual information or

personal or experts opinion on a research question; at some point it is also involving other necessary research component. (p.6).

The area of this research is in translation and technology, the technology mainly involved in this research is Google Translate and ChatGPT. The ST object for this study is the words, phrases, clauses, and sentences which appear in the Installation Graphical User Interface of Windows 11 Education, while for the TT object it is taken from the translation of the ST by Google Translate and ChatGPT. All of the data taken on 5 April 2023. The research focuses to analyze the category of error produced by Google Translate and ChatGPT when translating the object to Indonesian. Theory of error category by Koponen (2010) is used for the analysis.

To evaluate the quality of the translation, qualitative and quantitative method are used in this research. According to George (2008) qualitative research results in words, image, or nonnumeric symbol, while quantitative method results in measurement and expressed in numbers that can be analyzed (p.7). The reasons why both qualitative and quantitative method deemed necessary in this research are: qualitative method is used to detail the error in the translation produced by Google Translate and ChatGPT, while quantitative method is used to represent the number of errors made by the machine translation.

The steps of conducting analysis in this research are: first, taking the data in the form of words, phrase, clauses, or sentences from the Installation GUI of Windows 11 Education; second, feed the data to Google Translate and ChatGPT to be translated to Indonesian language; third, the translation results are noted; fourth, the errors are analyzed and categorized using Koponen's theory of error category.

FINDINGS AND DISCUSSION

Koponen divided the category of error into two, concept error and relation error. Concept represented by content words and can be units larger than individual words, instances given by Koponen are compound nouns, names, and idiom. Relation here means the relation between head and dependent; Relation is expressed through function words, inflection, and word order for the instance. (p.3). Thus, the error in concept means the error in content word that makes the TT is not in accordance with the ST, while the error in relation means an error which makes the relation between head and dependent in TT is not in accordance with the ST. Koponen further divides the error

concept into six categories, omitted concept, added concept, untranslated concept, mistranslated concept, substituted concept, and explicitated concept. For the relation error Koponen further divides into eight categories, omitted participant, omitted relation, added participant, added relation, mistaken participant, mistaken relation, substituted participant, substituted relation.

1. Concept Error

In this research there are 29 concept error found, namely omitted concept, added concept, untranslated concept, mistranslated concept, and substituted concept. Explicitated concept is the only error not occurring in both Google Translate and ChatGPT translation of the object.

Chart 1:
Percentage of individual error concept produced by Google Translate and ChatGPT

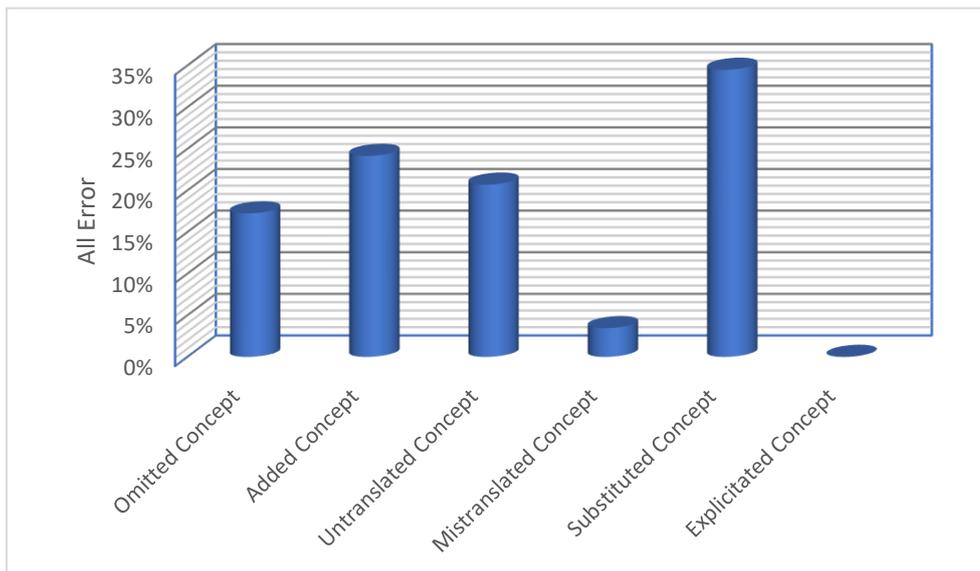


Chart 1 provides a visual representation of the percentage of individual error concepts produced by Google Translate and ChatGPT. It is apparent from the data that both machine translation tools exhibited a certain level of errors, although the distribution of these errors varied between the two systems.

Chart 2:
Percentage of individual error concept by Google Translate

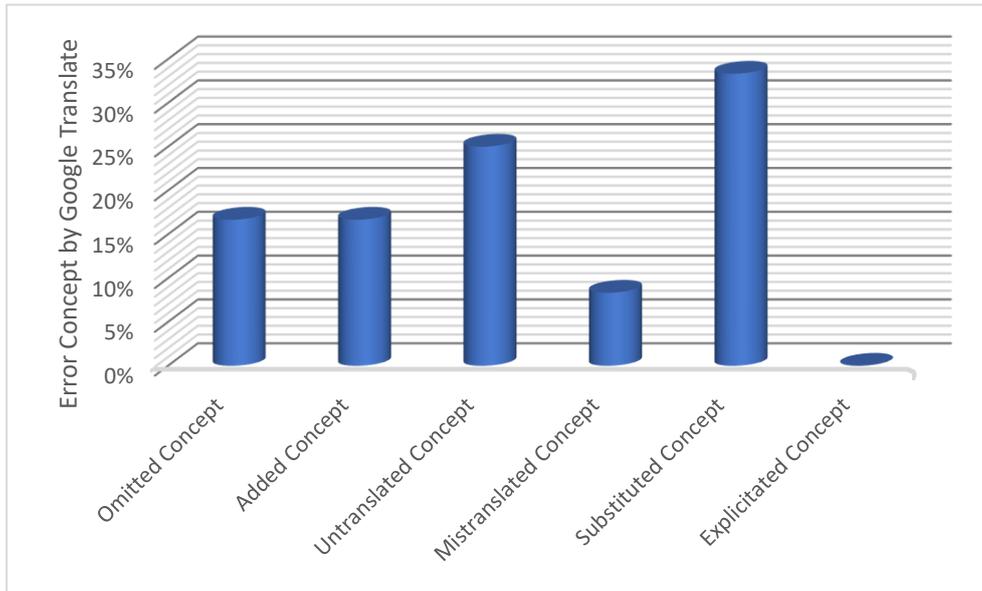


Chart 2 provides a detailed breakdown of the percentage of individual error concepts produced solely by Google Translate. The visual representation reveals the specific areas where Google Translate experiences difficulties in accurately rendering the source text.

Chart 3:
Percentage of individual error concept by Chat GPT

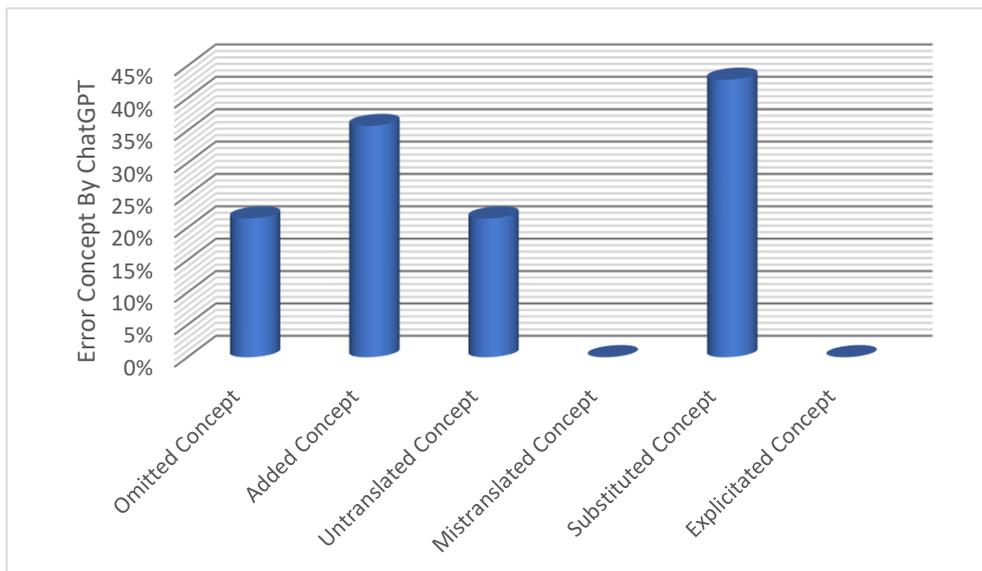


Chart 3 presents a comprehensive breakdown of the individual error concepts produced by ChatGPT. This graphical depiction reveals specific areas where ChatGPT encounters challenges in accurately translating the source text.

a. Substituted Concept Error

Koponen explains that substituted concept error is when TT can still be considered as a valid replacement of the ST, but not a direct lexical equivalent of the ST.

In translating the object, substituted concept is the mode of error in both Google Translate and ChatGPT as can be seen in the graphic 2 and 3. This type of error concept occur during translation of adjective, verb, noun, and adverb.

i. Google Translate’s Substituted Concept Error

The following section discusses the phenomenon of "Substituted Concept Error" as exhibited by Google Translate. This type of error arises when Google Translate replaces the original concept in the source text with a different one in the target text, thereby distorting the original meaning. The evaluation of this specific error is crucial, as it directly impacts the accuracy and quality of the translated text. The discussion will delve into examples of such errors, their potential causes, and the implications they carry for the overall effectiveness of Google Translate as a machine translation tool.

Table 1: Google Translate’s Substituted Error Concept Case on Adjective

No. of Data	ST	No. of Data	TT	Error Type
5/ST/ EN/W11I	Drive 0 <u>Unallocated</u> Space	5/TT/ ID/GT	Drive 0 Ruang yang <u>Tidak Terisi</u>	Substituted Concept Adjective

In data 5/ST/EN/W11I, word “unallocated” is rendered by GT as “tidak terisi.” The word “unallocated” consists of roots “allocate” and suffixes -un which indicates “not” (McCarthy, 2015), and -ed which indicates the past action. According to (Merriam Webster, 2023) the word “allocate” means to apportion for a specific purpose or to a particular person or things. The word “allocate” indicates action of apportioning the space (on disk) which in this case not yet done, while “terisi” indicates the state of the space. This step of Windows 11 installation requires user to allocate the space, the purpose of this step is to determine where the operating system and data will be stored.

Using phrase “tidak terisi” or in English “not filled” does not indicate that users need to take an action to that particular space.

Table 2:
 Google Translate’s Substituted Error Concept Case on Verb

No. of Data	ST	No. of Data	TT	Error Type
10/ST/EN/W 11I	<u>Making sure</u> you have the latest.	10/TT/ID/GT	<u>Pastikan</u> Anda memiliki yang terbaru.	Substituted Concept Verb

When translating the phrase “making sure” in data 10/ST/EN/W11I, Google Translate deletes the verb phrase and substituted it into imperative “pastikan” The effect of imperative is as if making the user has to perform an action. This step of installation does not require the user to take any action, user just need to wait for Windows 11 system to loading the data.

Table 3:
 Google Translate’s Substituted Error Concept Case on Noun

No. of Data	ST	No. of Data	TT	Error Type
11/ST/EN/W 11I	Let's set <u>things</u> up for your work or school	11/TT/ID/GT	Mari kita atur <u>berbagai hal</u> untuk pekerjaan atau sekolah Anda	Substituted Concept Noun

The other case can be seen in the translation of data 11/ST/EN/W11I. GT translates plural noun “things” into phrase “berbagai hal.” “Things” represents a single concept but the number is plural. In the phrase “berbagai hal,” the word “hal” or “thing” in English is modified with adjective “berbagai” which according to KBBI (2023) is synonymous with “bermacam-macam” or in English “various”. This translation is not a fatal because in this step of installation user again does not need to do anything, just wait for the Windows 11 system to loading the data.

ii. ChatGPT's Substituted Concept Error

Table 4:
 ChatGPT's Substituted Error Concept Case on Verb

No. of Data	ST	No. of Data	TT	Error Type
2/ST/EN/W11I	© Microsoft Corporation. All rights reserved.	2/TT/ID/ChG PT	Hak Cipta © Microsoft Corporation. Seluruh hak dilindungi.	Substituted Concept Verb

The translation of word “reserved” in data 2/ST/EN/W11I, into “dilindungi” or in English “protected” is not a fatal error. The copyright is indeed protected (by the law of international trade). However, because there is no explanation about who or what is protecting the “All rights,” it could create a confusion towards the user who is not familiar with the term. That is exacerbated by the presence of “Microsoft Corporation,” a question such as, “is it the Microsoft Corporation who is protecting the rights in my computer? But how?”, may appear. The law of international trade is not always applicable because it is the compliance of a country that decides either the rule can be used or not. By that explanation it is better to translate the word directly into “disimpan” which creates less confusion to the user.

Table 5:
 ChatGPT's Substituted Error Concept Case on Adverb

No. of Data	ST	No. of Data	TT	Error Type
5/ST/EN/W11I	Drive 0 <u>Unallocated</u> Space	5/TT/ID/ChG PT	Drive 0 Ruang <u>Belum</u> <u>Dialokasikan</u>	Substituted Concept Adverb

When translating the word “unallocated” in data 5/ST/EN/W11I, which is an adverb in that phrase, ChatGPT substituted it with phrase “belum dialokasikan” The problem is only in the word “belum” or in English “not yet”. The first problem is the prefix un- means not (McCarthy, 2015). The other problem is in this step it is possible for the user to have more than a disk and not all of the disks need to be allocated, only a disk needed to be allocated so the Windows 11 OS can be installed and the data can be placed. The effect of the usage of “belum” is as if there is something not yet done, whereas allocating is not something that must be done to all disk in this step.

Table 6:
 ChatGPT's Substituted Error Concept Case on Adjective

No. of Data	ST	No. of Data	TT	Error Type
6/ST/EN/W11	<u>Free</u> space	6/TT/ID/ChGPT	Ruang <u>kosong</u>	Substituted Concept Adjective

When translating adjective “free” in data 6/ST/EN/W11, ChatGPT substituted the word with “kosong” as can be seen in data 6/TT/ID/ChGPT. The default translation of word “kosong” is “empty” in English. According to Computer Hope (2020) Free space refers to the availability of the storage in computer (can be drive or disk). The word “free” means that the storage is available to be used. In a broader sense, word “empty” does not necessarily available to be used, for example “an empty house that I see in the road,” the house is indeed empty but we cannot just use it because someone else might have it. However, in this case it is not critical to use “kosong” as the substitution because the disk is yours. This is still put under the error category as a note that non-direct translation may be result in different meaning depending on the context.

Table 7:
 ChatGPT's Substituted Error Concept Case on Noun

No. of Data	ST	No. of Data	TT	Error Type
11/ST/EN/W11	Let's set <u>things</u> up for your work or school	11/TT/ID/ChGPT	Mari kita persiapkan <u>segalanya</u> untuk pekerjaan atau sekolah Anda.	Substituted Concept Noun

When translating plural noun “things” in data 11/ST/EN/W11, ChatGPT substituted the word with “segalanya” or “everything” in English. Again, this is not critical because in this step of installation the user just waiting for Windows to loading the data. However, it is clearly an error because word “things” refers to something of particular concept or type which is plural in number (Oxford Learner’s Dictionary, 2023), while word “everything” refers to more than a single concept.

b. Untranslated Concept Error

According to Koponen (2010) untranslated concept is when SL words appear in TT (p. 4). It is possible for a certain word from other language to appear in other language, so in this research it is considered as untranslated concept error if the translation result is not yet standardized by the TL and there is a valid replacement of that particular word but not used.

i. Google Translate’s Untranslated Concept Error

Table 8:

Google Translate’s Untranslated Error Concept Case on Noun

No. of Data	ST	No. of Data	TT	Error Type
4/ST/EN/W1 1I	<u>Upgrade:</u> Install Windows and keep files, settings and applications	4/TT/ID/GT	<u>Upgrade:</u> Instal Windows dan simpan file, pengaturan, dan aplikasi	Untranslated Concept Noun

When translating “upgrade” GT is not rendering it to Indonesian. There is a standardized word which can be a substitution for the word, that is “peningkatan”. The usage of word “peningkatan” would make it easier for Indonesian. According to KBBI (2023) the definition of “peningkatan” is *proses, cara, perbuatan meningkatkan (usaha, kegiatan, dan sebagainya)*, process, way, act to upgrade (business, activity, and so on).

ii. ChatGPT’s Untranslated Concept Error

Table 9:

ChatGPT’s Untranslated Concept Error

No. of Data	ST	No. of Data	TT	Error Type
8/ST/EN/W1 1I	Load <u>driver</u>	8/TT/ID/ChG PT	Muat <u>driver</u>	Untranslated Concept Noun

When ChatGPT translated the phrase, the word “driver” is not rendered into Indonesian. In this context it is indeed not familiar to translate “driver” as “pengemudi.” The word “pengemudi” is usually a mainstream render for the word “driver” in the context of user of a vehicle. The definition by KBBI (2023) also relates the word “pengemudi” as “orang yang (pekerjaannya) mengemudikan (perahu, mobil, pesawat terbang, dan sebagainya),” in English “person who (or

whose job) is driving (boat, car, airplane, etc.)”. However, if we see the function of the software (the driver) we could agree that “driver” in the context of computer software and in the context of user of a vehicle, to some extent, have a relation. According to Gillis (2022) driver is a special kind of software program that controls a specific hardware device attached to a computer. So, in the context of a user of a vehicle it is a person who is in control (of the vehicle), while in the context of computer field it is a software that is in control (of the hardware of the computer). By that explanation it is still recommended to translate the word “driver” into “pengemudi”

c. Added Concept Error

According to Koponen (2010) added concept is when a concept not existed in the ST, but added or appear when translating into TT.

i. Google Translate’s Added concept Error

Table 10:
 Google Translate’s Added Concept Error

No. of Data	ST	No. of Data	TT	Error Type
11/ST/EN/W11I	Let's set things up for your work or school	11/TT/ID/GT	Mari <u>kita</u> atur berbagai hal untuk pekerjaan atau sekolah Anda	Added Concept Noun

There is an appearance of word “kita” in the translation of data 11/ST/EN/W11I. Word “kita” is a pronoun which if translates to English means “we”. Koponen put pronoun under the category of relation, however because the word “kita” here does not have reference to persons it is considered as a single concept. This addition is not a critical because it is a loading part of Windows 11 installation GUI and the user does not need to do something.

ii. ChatGPT’s Added Concept Error

Table 11:
 ChatGPT’s Added Concept Error Case on Noun

No. of Data	ST	No. of Data	TT	Error Type
3/ST/EN/W11I	Setup is starting	3/TT/ID/ChGPT	Memulai <u>persiapan</u> instalasi	Added Concept Noun

There is an addition of word “persiapan” or “preparation” in English when ChatGPT translates data 3/ST/EN/W11I. Preparation is usually before something started, in this context the system already starting the setup and no longer doing the preparation of it, so this is considered as an error.

d. Omitted Concept Error

According to Koponen (2010) omitted concept is when TT not conveying the concept existing in the ST.

i. Google Translate’s Omitted Concept Error

Table 12:
 Google Translate’s Omitted Concept Error

No. of Data	ST	No. of Data	TT	Error Type
2/ST/EN/W11I	© Microsoft Corporation. All rights reserved.	2/TT/ID/GT	© Microsoft Corporation. Seluruh hak cipta.	Omitted Concept Verb

When GT translates clause “All right reserved”, GT omit the verb “reserved”. The result of this omission is obscurity of what is happening to the “All rights”.

ii. ChatGPT’s Omitted Concept Error

Table 13:
 ChatGPT’s Omitted Concept Error

No. of Data	ST	No. of Data	TT	Error Type
10/ST/EN/W11I	Making sure <u>you have</u> the latest.	10/TT/ID/Ch GPT	Mengecek pembaruan terbaru.	Omitted Concept Verb and Noun

In the translation of data 10/ST/EN/W11I, there exists two errors conducted by ChatGPT. The first error is the omission of “you” and the second is the omission of “have”.

“You” is indeed a pronoun, Koponen put pronoun under the category of relation, however the word “you” in this context is not function as a reference to another concept, so the word is considered standing as its own concept.

The omission of that verb and noun also remove the matter that Microsoft wanted to convey, that they prepare the best for the users. That is not a critical error, but from the perspective of Microsoft, it is loss.

e. Mistranslated Concept Error

According to Koponen (2010) mistranslated concept is when TT concept has the wrong meaning for the context (p. 4).

i. Google Translate's Mistranslated Concept Error

Table 14:

Google Translate's Mistranslated Concept Error

No. of Data	ST	No. of Data	TT	Error Type
1/ST/EN/W1 1I	<u>Windows</u> setup	1/TT/ID/GT	Pengaturan <u>jendela</u>	Mistranslated Concept Noun

The last error concept which appear only once in Google Translate. Google Translate seems to not know that "Windows" here refers to the brand of the operating system, so GT translates the word into "jendela". What is interesting from this part is that ChatGPT would translate the word "Window" as the brand of the software if provided with other context or translating other context first, for example after we ask the ChatGPT to translate words, phrase, clause, and sentence that we provided, then we provided such as "free space", "installation", ChatGPT would then automatically not translating the word "Windows". ChatGPT seems to know that "Window" is a brand of operating system which produced by Microsoft Corporation.

2. Relation Error

In terms of relation error, it is found there is only one type of it, that is added participant error. Below is the example of relation error.

Table 10:

ChatGPT's added participant error

No. of Data	ST	No. of Data	TT	Error Type
3/ST/EN/W1 1I	<u>Setup is</u> <u>starting</u>	3/TT/ID/ChG PT	<u>Memulai</u> <u>persiapan</u> <u>instalasi</u>	Added Participant

The error occurs due to the addition of concept "Persiapan" or "preparation in English. This addition makes the "setup" or "pemasangan" or "instalasi" still exists, but no longer the subject that is starting the action. It is now "persiapan instalasi" or "setup preparation" that is started by something, by saying "is started" it means they are passive, no longer active like in the ST.

CONCLUSION

In terms of concept error which Koponen divided into six categories, only five categories are found in the translation of the object by Google Translate and ChatGPT. The founded categories of error are omitted concept, added concept, untranslated concept, mistranslated concept, and substituted concept.

If the concept error (of Google Translate and ChatGPT) is put together in a statistical chart, the mode of concept error is the substituted concept as can be seen in graphic 1. The interesting fact is that even if the concept error is not put together, it is still the substituted concept error that is being the main error as can be seen in graphic 2 and 3.

Google is found to commit four substituted concept error which divided into substituted concept error when translating adjective, when translating verb, and when translating noun.

ChatGPT is found to commit six substituted concept error which varies more compared with Google Translate. The substituted concept error in ChatGPT is when translating verb, when translating, adverb, when translating adjective, and when translating noun.

In translating the relation (head and dependent of a phrase) both Google Translate and ChatGPT are very good. That is proven by there is only one type of relation error that is found, that is added participant which occur due to the addition in concept.

This research discusses but a very small part of computer field. This research discusses the error that is produced by the MTs in translating text object that appear in the installation GUI of Windows 11 Education. To better this research other research may try to analyze error which occur in the translation of text object in the computer field which related to another field, for example computer software that is used as an aid in designing architecture of building or electronic. This research heavily relies on the theory of Koponen (2010) in analyzing the category of error produced by the MT, other researches may try other theories to analyze the category of error that produced by MT.

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