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Development of Translating Software Makassar Language into the Indonesian Language Grammar-Based

Agussalim[1], Darwis[2], Noer[3], Najib[4]

[1, 2, 3, 4]Faculty of Cultural Sciences, Hasanuddin University, St. Perintis Kemerdekaan, Makassar, Indonesia

Abstract: ***The purpose of this research describes results of penerapkan theory of grammar into the Makassar language translation system into the language of Indonesia. This research menggunanakan method of research and development that combines qualitative and quantitative methods. The results of this research resulted in two systems namely; (1) the translation system with the theory of tagmemik and (2) the translation system with semantic features. The results of this research show that the application of the theory of tagmemik and semantic feature has been successfully applied to translation and system run well. Parsing the input text by tagmemik theories on penerjemhan system has managed to identify each morpheme in the input sentence Makassar. Transfer of pattern language to the language Indonesia Makassar also has shown good results. The application of semantic features of the translation system has also been successfully applied, the system has been able to differentiate the noun that occupy every function in the sentence. But there are still some obstacles in its implementation, such as; morfofonemik rules that affect the precision of the system in the determination of the morpheme, morpheme identifying which have in common with the other syllables in the morpheme, and yet the origins of both of those systems.***

Keywords: System translation, translation, grammar.

1. Pendahuluan

The influx of information technology also adds a new realm in the use of language. Social media, email, blog, chat, online games are some of the ranahh that is provided by information technology in communicating on the internet. Translation software can help humans communicate in the realm. Whether or not comfortable communicating in internet media rely on the convenience offered by the system are. The more the simplicities, then speakers of the language or the people who want to learn the language, would love to use that language. The more often the language used in the internet, the vast spread of the language.

Makassar language preservation (hereinafter abbreviated as bM), according to data collected from research conducted by Dervish (2009) that bM has begun shifting its growth, one that slows its growth is its less well, what else its use on the internet. In addition, the regional language of ancient society because it is not connected with modernity (Derwis, 2009).

Regional language is a symbol of the area, regional identity, and local wisdom. Regional languages also contain messages worth, for it is a must for any native language in order to keep its territory menguasi can preserve the culture. However, at the present moment this is not everyone is able to master and use the language of his territory well.

In bM use of internet media is not maximized. Makassar Most people would rather do chat, send email messages, status updates using Indonesian (hereinafter abbreviated bI) than using bM. For people who first learned bM more trouble again because it is not facilitated in its use on the Internet

So far the innovations already entered on the creation of characters that can be used on Lontara internet media. This innovation is already helping the bM speakers during this write Lontara using Latin alphabet in internet media. But what about people who want to learn or want to preserve bM?, surely this innovation is not enough if not coupled with bM translation software to bI.

In the field of translation software, bM not have any particular software, most of the current translation software translation software is widely used in the world language such as English, Arabic, Spanish, Chinese, etc. As for language translation software is still very limited areas, for example Java language translation software on google translate.

Google translate using statistical analysis in translating the source language to the target language. The translation process is done, Google Translate shaped word by word translation, (Rhida, 2011). This translation software determines the sentence patterns based on sample data existing sentences or who have been trained to him (Ramdhani, 2007). Penerjemahnnya relies heavily on the example sentence given to him. Such a model would be produced translations that were not in accordance with the rules of grammar because it relies on a data sample sentence available to him, rather than relying on the rules of grammar that exist in both languages. Not to mention the language rules at the stage of the parameters, so it needs more complex rules. In order to produce a translation that is in accordance with the rules of grammar need for research that applies the rules of grammar translation software. So far the language has a complex morphology rules become a big problem for statistics-based translation (Kirchhoff, Tam, Richey, & Wang, 2015).

In the manufacture of intelligent software in this intelligent in translating, grammar is very necessary to get good output quality. In the history of the translation software, intelligent

software have experienced a decline in the quality of its output during the development of the science of artificial intelligence (Artificial intelligence) (1966-1974) is caused by the software have no knowledge (grammatical knowledge) against the subject. An example is Weizenbaum's ELIZA program (1965) that can do serious conversations on a variety of topics, in fact is merely borrowing and manipulation of sentences that were typed by humans (Suyanto, 2010).

Software should have knowledge of the subject in order to analyze and make decisions based on the knowledge available to him. Similarly, the intelligent translation software development must have a knowledge of grammar that the software is not just translate a word or phrase based on lexical available to him, but the software is able to analyze sentences and grammar set to be translated. The more complex grammatical knowledge instilled him, of course, the better the translation quality.

During this time most of the science of grammar is only linked on what is in the human mind in the form of an understanding of the subject, but the process of understanding that cannot be seen and how humans think about that. The process of understanding or cognition not only occur in humans only, since the emergence of the science of artificial intelligence (1956) Start computer scientists trying to design his software on cognition or called by the algorithm. The most fundamental cognition difference between humans and software is a process of cognition human being cannot be seen and reverse the process of cognition in software can be seen.

In sintagmatis are assigned grammatical issues that will be confronting the software translation bM is the issue about the relationship between subject, predicate and object. Not all nouns can function as the subject, not forever verbs as predicate. If the problem occurs on a piece of software, what have been the benchmark of a software to be able to know that a noun that is a subject or object with rules based on the pattern on the source language sentence?, surely a software need to have criteria for the determination of the subject and object based on a rule pattern language.

Whereas in the paradigmatic are assigned grammatical issues that will be confronting the software translation bM is how software analyzing the propriety of a noun in order to have the function of the subject or object of a sentence in the source language. This analysis is made after analysis of the determination of the subject and object based on the pattern of the sentence was carried out.

Before the software to analyze the input of the source language by using the rules of grammar, first a software must be familiar with the nature of a word in a sentence such as phrases and categories to make it easier to determine the function of the word stretcher. The means used to analyze the phrases and categories contained in the input sentence is to do the parsing. The theory is used to parse the input was the theory of generative transformation. In this theory there is one component that regulates the phrase that has the ability to parse a sentence. With the application of the theory of generative grammar tansformasi expected to gives the ability to analyze the translation software to be able to determine the function of the word in a sentence. Parera (2009) in response to the theory that a grammar transformation that wants to explain the terms of the semantics of a language have to go through and meet the transformation subcomponent (Parera J., 2009). Neither the translation software, in order to produce a good translation of the meanings of words necessary semantic data / meaning of the source language sentence and this can be obtained by the theory of generative transformation. Weaver and Bar-Hillel assert that semantic models necessary to achieve results that approach the translation human translation (Jones, et al, 2012)

A common issue faced by the translation software is ambiguity, the ambiguity problem can be solved by context, while the translation software has not been able to capture the context of an interaction between the user (user) and software (software). In translation software ambigutias problem is often found in the translation software. When the software translation gets input a sentence containing the phrase or word that berambigu it greatly affects the quality of the translation of the meaning of a sentence of a software translation, it is because the software translation has not been able to analyze up to the level of the context of a body of words or phrases, software translation is analyzed at the level of syntax. In general, humans easily interpret the meaning of the text is ambiguous.

Another case if the translation software gets berambigu text, software must interpret based meanings to it without seeing its context. Therefore, a translation software must have rules to overcome the problems ambiugitas in translation. Another problem particularly in view of bM is homograph. In KBBI homograph is a word spelled the same in other words, but different pronunciation and meaning. As an example could be pronounced the word bl balla or ballang. If in a written text that includes the word homograph will menimbulkann problems in giving the meaning of the text. If a translation software gets the source language text form which homograph words, the software must provide interpretation based on meaning it contains. A man very capable of interpreting the meaning of the word berhomograf with her existing context. Translation software should have its own rules to address the problem homograph.

In this study the problems of ambiguous and homograph handed over to men, but the meaning of the word is still provided by the software. Software only provide meaning and men that choose the exact meaning of the text.

Another problem associated bM when it will be translated into bI is a problem in the formation of the verb, which is in the formation of the verb morpheme could involve up to six at a time. The morpheme can be a verb, verb prefixes marker types, comitative, aspects, and frekuentif enclitic.

Aklampatompakseng					
aK-	lampa	tong	-pa	-ak	seng
Pref	pergi	komitatif	Fut	P1. Enk	frekuentif
	Pergi	juga	nanti	saya	lagi

‘Nantilah jika saya pergi lagi’
‘later if I go again '

In the above example, there are six morpheme forming aklampatompaseng word ‘later if I go again ' (1) prefix ak-, (2) *Lampa* verb 'go', (3) comitative -tong- (4) -pa futuristic aspect 'later '; (5) enklitik -ak 'I' and (6) frekuentif -seng.

If the above verbs translated to bI, the verb will be a few words. A translation software must have rules to overcome this problem. To address the above a translation software translation in this case bM to bI needs to have common rules of language and rules specifically against the language used. Both of these rules be established through the theory of universal grammar theory or the theory of grammar that describes in detail the rules on a specific language.

The research relevant to this study is oenelitian performed by Evi Yulianti, et al (2011) with the title Indonesian-English Developing Hybrid Machine Translation System, Susanto, et al (2012). The title of this research is Rule-based Machine Translation between Indonesian and Malaysian and Kaljahi (2015) under the title "The Role of Syntax and Semantics in Machine Translation and". The similarity of this study with previous research that is equally menelitia English grammar using software applications.

2. Review of Literature

Grammar of Tagmemik

Flow Tagmemik pioneered by Kenneh l. Pike. According to this basic unit of flow syntax was tagmen (stem from the word which means the order of Greece). Tagmen is the correlation between grammatical functions or slot with a bunch of other forms of words that can be exchanged to fill the slot. For example, in the sentence that pen is on the table.

The shape of a pen that fills the function of the subject, and the subject is represented by a tagmen pen it. According to Pike's basic unit of syntax cannot be expressed with functions such as subject + predicate, + object and cannot be represented by a row of forms, such as the phrase objects + work + phrase phrase object.

1. The characteristics of the flow of Tagmemik Grammar

a) Each Structure Konsists of Tagmen-tagmen

Tagmen is part of a grammatical construction that has four different attributes, specifications of the completeness of the slots, klas, the role of, and cohesion.

The slot is a marker of tagmem which is an empty place in the structure to be filled in by the function tagmem. In the tagmem function of the clause level can be either subject, predicate, and object. In Iain function tagmem can be either a core (the nucleus) and the outer core (the margin). Traditional and structural theories refer to it with the term "title" and "fungtor".

Klas is a marker of tagmem which is the real form of slots. Realization of the real form of lingual units names from the lowest level (i.e. morpheme) to the highest (i.e. discourses). The theory of the transformation of the language also analyzed the top of lingual units of this kind, but only limited between sentences and morpheme, the banished one important level i.e. the clause.

The role is a marker that is a master tagmemes tagmemes function. The carrier tagmemes function in Grammar Case (Case Grammar) it is the only main object of study. Cohesion is a marker tagmemes who is the controller of the relationship between tagmemes. The controller of this relationship at the level of the clause in the form of rules transitive, intransitive and equational

b) Is eclectic, tagmemik theory is eclectic, which is a blend of various sorts of theories were summarized in accordance with the respective propositions.
c) Universal character, tagmemik theory is universal. Universality or totality in this theory not only in the sense of totality applies to all languages. However, also in the sense of totality can apply to all areas of human life.
d) Three Hierarchies Linguistics, according to this theory, there are three linguistic hierarchy, namely:
   1) Referential hierarchy Hierarchy is set up tata meaning which ranged from meaning leksem), term, proposition, development themes, to social interaction.
   2) Hierarchy fonologikal hierarchy is set up tata's sound from sound units up to the syllable.
   3) Grammatical hierarchies, the characteristic of the flow Tagmemik in terms of Grammatical hierarchies. Grammatical hierarchies on the flow of the Tagmemik from the morpheme, Word, phrase, clause, sentence, paragraph, monologue, dialogue, conversation, to discourse
e) Studies on grammatical hierarchies, the lowest level in the hierarchy of grammatical according to this theory is the morpheme, while the highest level was discourse.
f) Slot in the clause, the clause level slot on the subject, predicate, object, and adjung. In the sentence there is no subject and also no predicate. Adjung any object and, of course, there is no well. All of it is simply property clause, not his sentence. Slot on the level of sentences in the form of core (the nucleus) and the outer core (the margin) or staple and designations, or topic and comment.
g) Predicate verb, predicate slot tagmemik in theory should be a verb. In addition verb may not occupy a slot predicate.
h) Characteristics of conduct and EMIC, it began to enforce the existence of flow characteristics and -emik -etik inside the structure. -etik characteristic is a characteristic that does not distinguish the structure, while the -emik characteristic is a characteristic that distinguishes the structure.
i) The formula in the analysis, in obtaining analysis using a formula that neat, double, and complete. If necessary to use a tree diagram. However, the way the latter is less preferred because it is less practical.
j) The analysis starts from the clause, if the flow of starting structural analysis of words, transformational theory began its analysis of the sentence, then the theory tagmemik began its analysis of the level of the clause. Thus, the position is very important clause level.
k) There are no boundaries between morphology and syntax, morphology and syntax merged into one hierarchy, the hierarchy of the grammatical level range from morpheme to discourse.

2. Grammar Flow Analysis Tagmemik

In anjo sentence patolok ratei mejayya ri. Anjo shape patolok fill the function of the subject, and the subject is expressed with anjo tagmen patolok. According to Pike basic syntactic units can not be expressed by functions, such as the subject + predicate + object and can not be expressed with a row of forms, such as labor phrase phrases + object + object phrases. Rather it should be disclosed together in a series of formulas, such as

S:FN + P;FV + O:FN.

The function of the subject is filled by a nominal phrase followed by a predicate function is completed by a verbal phrase, and was followed by the function object that is filled by the nominal function. next the second element tagmen, the function and the form (category filler function) then coupled with elements of role (meaning), and cohesion (attachment between lingual units) which form a braid tightly. Thus the basic units of syntax that IE, tagmen is a function, category, role, cohesion.

Example sentence:
I angngukirikak Nakke surak
I wrote a letter
Analyzed in tagmemik would be as follows:
I angngukirikak Nakke surak
I Nakke as a function of the subject, pronouns, and performer
Angngukirik as a function of the predicate, the verb is transitive, and active
Surak as a function object, nouns, and goals.

a) Transformation Grammar

Grammar transformation was introduced in 1957 by Noam Chomsky, his ideas about the transformation of generative grammar make revolution in the field of linguistic analysis. Despite his linguistic theories today are very different, we can not speak of linguistic transformation without seeing generative grammar of Chomsky. Chomsky theory offers a math-based rules that can be used to describe how the speakers put a sentence together.

Beginning in 1957, Chomsky introduced two central ideas that are relevant to the theory of grammar. The first is the distinction between competence and performance (competance) (performance). The center of his theory is an explanation of the knowledge underlying the human ability to speak and understand (Hurley, 2015). Generative transformation is a process or rule changes in structure (deep structure), the outer structure (surface structure) or the surface, either in the add, subtract (omission), Exchange, as well as the turn. Generative transformation theory reviewed the language based on the viewpoint of the language itself, as well as examines the elements and their functions in the language are examined. This rule applies after the publication of the book Aspects of the Theory of Syntax (1965).

The selection of this theory by arguing that this theory is not only beneficial to the fundamental grammar analysis but also gives invaluable insight towards languages that haven't been touchable by other theories. In transformational generative grammar, grammatical functions such as subject, predicate, object, and so on is not stated explicitly in the syntactic norms, whereas the function it plays an extremely decisive in peranahn the syntactic structure of a language. Because of that, then the functions it should be stated explicitly in the norms of syntax, so the need to consider other types of grammar (Haruna, 1989). This theory of the translation software will usher in determining the function of each component forming sentences.

Chomsky stated that one of the components included in the competencies are semantic components (Chaer, 2003). To be able to produce sentences grammatically and semantically acceptable, theory of generative Linguistics standard transformation theory of semantic features (semantic feature) or also called semantic marker (the marker is semantics). This mengansumsikan theory that every word has a number of features that make up the semantic meaning of the word fully. The standard theory of transformational generative expanded stating the existence of this semantic component as a component in the brain is separated from the syntactic component with the firm.

Language experts give semantic notions as a branch of linguistics that studies the relationships of linguistic signs with stuff that was tagged. Larson suggests that a Word is a combination of semantic features (Chaer, 2003). In other words, the meaning can be explained on the basis of what is called features or semantic markers.

The components of the semantic difference related to the meaning and characteristics of a semantic difference. The inner structure of a sentence contains the information necessary to interpret it semantically. The characteristics or features of the semantic difference semantic difference (semantic feature) with regard to the analysis of the meaning of a lexical grains, for example:

a. nouns: animate (people, flora, fauna)--lifeless, concrete-abstract-is--without the collective, not the collective
b. verbs: action, process, State of
c. adjectives: character, form, size, time & age, color, power energy, sensory impression.
d. numeralia: number, sequence, level.
e. tasks:--defiant, quantity, border, cursor-aspektualitas, modalities--quality (positive, intensive, elatif, excessive, atenuatif, augmentatif; ekuatif, comparative, and superlative)--additive, alterantif, kontrastif, time, suppositions, affirmation. (Sudaryat, 2012)

This semantic features will help software translation bM to bI in determining the propriety of a verb or a noun in the filling position on sentence entered. A machine was only able to capture the structure of a given text. The received structure will be analyzed and determined category. If a machine has only competence of a Word only a category, then in the determination of the functions will have constraints. The text of the sentence Annakbangi taua poko ' that man cuts down a tree ' which is being input in machine translation, will be analyzed and determined that there are two noun IE; Tau "people", "tree", the object of a verb nakbang "slash", the prefix aN-, and determinants – a "that". At the time of the transfer of the pattern of the system bI bM to be constrained to a noun that would fill the function of the subject in bI translation. The system does not have the competence of any noun can occupy the function of the subject, because the

machine is only equipped with such competence category types only. If every word in the translation machine is equipped with a semantic feature, then it could be a reference for the machine in determining the appropriateness of a noun in the subject in the sentence occupying visits function of the verb.

b) Computerized Linguistics

Disciplines have developed new perspectives and frames of reference for various related fields concerns against the language, including language teaching, language style, letter recognition, translation, lexicography, language policy, and computing Linguistics. The field has helped in developing the theory of Linguistics. (Gargesh, 2006). Linguists are not the only scientist who wanted to test the theory of language function. As with Chomsky, never believe that Computational Linguistics is a way to test the theory of Linguistics. (Wilks, 2006)

Computational linguistics or Lingistik computing is considered a natural language processing automatically, because the main task of Computational Linguistics is to build a computer program that is able to process words and texts in natural languages. In this field of Linguistics is more dominate than computer science arguing that language rules are applied automatically in the software, rather than purely using the rules of the algorithm. An algorithm on a computer can vary, while the linguistic rules are only sourced from the theory of the language used. Not all the programs that come into contact with natural language is a linguistic program. Although the word processing program on the windows experience text in natural language processing, it is not considered as linguistic software, because they're not quite depend on linguistic rules. As an example of a program that can count the number of words in a sentence or in the scale is a discourse. Although the text in natural language discourse is however to determine the number of words in the discourse does not require linguistic rules.

Many efforts are being made to build language processing systems in the absence of sufficient understanding in theoretical linguistics. They hope will succeed with smart math algorithms, both in assembler, or in terms of the speed of the computer. All these businesses have experienced failure and brought the conclusion that the need for theoretical science to membagun the language processing systems (Ralph, 1986). Many programmers realized that theoretical linguistics is indispensable to design intelligent machines. Most programmers are not capable of putting together a formal grammar and dictionary of computer natural language, whereas the program relies heavily on rules and dictionaries. They cannot even understand the advice of professional linguists about the grammar rules. On the contrary, a good background in Linguistics will allow new specialists in computational linguistics to work productively in interdisciplinary science. Maybe even guide them to generate some new approaches and ideas. (Ralph, 1986)

c) Translation Application

Machine translation is the process of translating the text automatically from one language to the other processes and realized in a program (Garvin, 1963). This translation is difficult because natural language is very complex. Many of the words have different meanings and possibilities in the translation. Each sentence may have a relationship between components of the other sentences, in addition, sometimes the need for other knowledge to translate such knowledge of the culture and the context of the sentence (Och, et al., 2004)

Translation software is a computer software capable of translating or mengalihbahasa automatically a source language to a target language. At a basic level, the translation software to do simple substitution of words from one natural language to another language. But the way it's usually cannot produce a good translation of the text, since it also required the introduction of phrases intact and the approach to the destination language.

Translations done by human beings differs translations done by computer software. Human translation is very easy to take into account the outside of the target language as context, while computer software is still not able to touch these aspects. Excellence of translation software is on pace in the translation, this advantage is widely used by humans in translating.

Computer-assisted translation program is usually accompanied with the ability to analyze in detail the language by kaidah-kaidahnya, such as morphology, syntax, and semantics. This rule uses linguistic rules extracted manually and produce a form of words that match the rules (Mahmoudi & Faili, 2014). Computers are superior to humans in terms of the ability of an infinite memory, performance is the abiding principle, and its velocity. However, sutingan the end result need computer translation done by humans because the computer is not creative. (Cahyoo, 1995). There are several methods of translating the software is widely used in statistical translation methods or Statistical Machine Translations (SMT) and translation or rule-based grammar Base Machine Translation (RBMT). SMT design software algorithm using statistical calculations to translate a specific language sentence into another language. One statu SMT famous example is Google Translate and Microsoft Translator.

Because it uses the stats count, then the SMT need examples of existing translations. Examples of translation then calculated the odds of a word or phrase is translated into other languages. The results of this calculation generates a translational model. Needed also example sentences in both languages. Example sentences used as model language. This language model is used so that the resulting translation grammar language better. The more data the example data translation and example sentences, the translation results well produced (Herelam, 2012). The problem that arises is the system is not using enough linguistic theory to produce a grammatical sentence (Ahmed & Hanneman, 2005).

Rule Based Machine Traslator (RBMT) using the rules of standard language in translating. In addition to those rules, also required a data dictionary for each word in two languages. So every word translated one by one, then set again based on the rules of the standard language. RBMT system is deductive; they use the language rules, dictionary, and other rules, explicitly encoded in a form that can be read

by a computer. Encoded knowledge is derived from linguistic knowledge. In the process of making this RBMT system involves programmers and linguists (Clark, Chris, & Lappim, 2010). RBMT more efficient in processing compared SMT As noted in Barton (1984), that the Earley algorithm (1970) for parsing using four times as long in the proceeding while RBMT only doubled the time used. Examples of application of this rule is based Rekso translator. In contrast to the SMT which requires only one statistic rule for all languages, RBMT require separate rules for languages who want translation in this method

The latter method developed is Hybrid MT is a combination of SMT and RBMT. There are several techniques hybrid MT, among others: the output of the rule-based MT, then the result is set longer based on statistical; or the result of translation of SMT was rearranged gramm ar based on standard rules. The translation of the SMT are then rearranged grammar, generally of better quality than other translation methods. (Herelam, 2012)

Involved in the design or development of translation software, fundamentally requires three parts; input (input data), process (input analysis), and output (input data analysis). These three fundamental things will go well when the understanding of the subject matter, will pengetahhuan linguistic rules, and planning in designing software is well understood.

To make planning run systematically required the models in the making. One model that is widely used in software is merangcang a Sequential Linear or Waterfall Development Model. In this model the things that need to be done such as; defining the problem / defining the problem, planning / planning, implementation / coding, documentation / documentation, testing / testing, operation, and maintenance (Sarker, et al, 2015).

d) Sentence Single Language Makassar

Single sentence is a sentence that occur from one clause free. Single sentence usually also called simple sentences, simple sentences, or sentences ekaklausa (Daeng & Shamsuddin, 2005). Elson and Pickett defines a single sentence as a sentence consisting of one clause clause freely without bound (Tarin, 2009). In general sentence predicate-subject bM patterned similarly to the patterned Bugis language subject and the predicate subject function can be loaded and run by a pronoun suffix on the verb, either with or without the actual subject (Dervish, 2014). bM is basically the pattern in which the V / S / K, V / S / O / K, V / S / O, V / S and K / V / S.

Akdanggangtongi (manggena) ri pasarak
aK- danggang -tong -i manggena ri pasarak
Pref dagang Kom P3.Enk ayahnya Prep pasar
Vint/P Pem.S S K
Berdagang juga dia ayahnya di pasar
'Ayahnya berdagang juga di pasar'

Angginuki kopi manggeku
aN- inuk -i manggeku kopi subanngi
Pref minum P3.Enk ayahku kopi kemarin
V/P Pem.S S O K
Minum kopi ayah saya
'Ayah saya sedang minum kopi'

Appilajarakka aksara Lontarak
aK- pilajara-ka aksara Lontarak
Pref belajar P1.Enk aksara Lontarak
V/P Pem.S O
Belajar saya aksara lontarak
'Saya belajar aksara Lontara'

Akgorai (pabaluka)
aK- gora -i pabaluk -a
Pref teriak P3.Enk penjual Det
Vint/P Pem.S S
Berteriak dia penjual itu
'Penjual itu berteriak'

Ri dallekang cokkoi anakna
Ri dallekang cokko -i anak -na
Prep depan sembunyi P3.Enk anak Pos
K V Pem.S S
Di depan sembunyi anaknya
'Anaknya sembunyi di depan'

Based on the types of verbs, the sentence can be divided into active sentences ekatransitif, active sentences dwitransitif, intransitive active sentences, active voice semitransitif.

e) Algorithm

Algorithm is a technique of preparation steps to resolve the problem in the form of sentences with a limited number of words, but arranged in a logical and systematic. The algorithm is also defined as a clear procedure for menyelesaiakn a problem with the use of specific steps and limited in number. (Suarga, 2012)

Some of the words that became the core of the above definition is arithmetic (mathematics), rules, input, output. The algorithm is applied in computing science as a measure for how the computer or the software can solve the problems, including the phenomenon of linguistic phenomena.

The most important element in producing intelligent software is the algorithms. With input algorithms can be processed and produce the desired output. The more complex the knowledge embedded in the algorithm, then the output results will be better.

f) Translation

Nida and Taber define translation as an attempt to reproduce the message from the source language into the target language with a natural equivalence that as closely as possible. The first thing to do is to give meaning to the message and then set the style of the language used. (Hartono, 2003). Translation is the interpretation of a text's meaning in a particular language (the source language) and the income that is the equivalent text in another language (the target language) that communicates the same message. Translation should consider several constraints, including context, rules of grammar, writing conventions, idioms, and other things between the two languages.

When viewed from the translation type of translation is divided into four ways (1) the literal translation, (2) dynamic translation, (3) an idiomatic translation, (4) semantic

translation and communicative. The literal translation is a translation that prioritizes equivalent word or expression in the target language or references have the same meaning as the word or expression in the source language. For example, the word cat is a cat inside bI and should not be interpreted in more than quadruped smallish, and are in the feline family.

g) Translation System Concept

Systems that use on this translation software is a system of grammar rules based on linguistic rules drawn from various sources. The ability of this translation software is able to analyze the syntactic level of both languages. Processing steps to bI bM text shown in the image below.

3. Method

This research methodology approach using a mix of quantitative and qualitative methods. A mixed methodology approach was chosen because the researchers research methods used are research and development (R & D). Things that need to be understood in the use of R & D method is a method of data collection is done in kuantitaif and qualitative. as for the scientific approach in this dissertation is the applied linguistics (applied linguistics) that focuses on computing (computational linguistics) and translation (translation). R & D model used by researchers is made up of six stages. Researchers hope by the sixth stage of the third sub terbut could answer the problem in this research.

The location of this research is in the district. Gowa, research locations in the district. Gowa is because the object of the study is the native language Lakiung dialect. Dialect lakiung selected as the research object because the dialect is the standard dialect bM. The type of data source in this research is the data in the form of oral and written documents. The data in this study is spoken utterances number of informants, while the written data derived from folklore texts adapted to the purposes of research.

Informants here selected purposively. Four people act as active informants and one key informant. Active informants in charge of providing linguistic information in accordance with the required data, while key informants in charge of providing comparable data in case of variation of utterances.

This study uses qualitative and quantitative approach to applying the descriptive method (Sudaryanto, 1993). Data were collected in the form of spoken words, phrases, sentences. The focus of this research is intransitive sentence, dwitransitif, ekatransitif and semitransitif.

Data was collected using techniques refer Engaged see through conversation (SLC), while recording technique and technique of each note as advanced techniques. This data collection techniques such as implementation begins with a conversation techniques semuka be asked questions with questions directed, through free speech, and asked the informant told him. The title story is determined by the informant. Then, researchers recorded the speech directly.

The collected data were selected and retrieve data needed in designing a translation software in this study. Data have been obtained classified based on the type of active sentences, so the researchers took the rules of the units in the formation of sentences. The unit of concern is the verb. Rules of behavior derived verbs in sentences such as affixation, Morphophonemic, pronouns and aspects will be included in the translation software in the form of a programming language by using software Netbean. Data obtained from observations also semantic noun features, these features are entered into the translation software. Any data sentence translated into Indonesian and look good transition rules within the scope of the phrase or sentence.

Each rule has the function of each one still so as not to overlap. In this study, related to the rules of morphology and syntax of grammar were taken over by tagmemik. Analysis of tagmemik grammar memungkinkn do the analysis up to the level of the morpheme. For translation and semantic rules are taken over by the grammar the transformation. The components contained in the grammatical transformation of semantic features can help in administering the grammatical meaning.

Software translation which has been furnished with a grammar rule to test the accuracy of his interpreter. Translation software test results described both strengths and weaknesses.

4. Finding

1) Theory tagmemik in translation system application of the theory tagmemik in translation systems have been implemented and shown good results. Components such tagmemik theory; slot, class, role and cohesion has been able to run the system in translation. Some of the problems found in the application of this rule, such as that complicate the process Morphophonemic class system in the identification and similarity syllables that are so very difficult class level translation system in identifying these classes.
2) The results of the basic sentence Makassar language translation results generated translation of this system has shown a good performance. This system is able to translate a few sentences grammatically in basic sentences are bertipologi VS, VSK, VS-Pel, VS-pel-K, VSO,

VSOK, SVO-Pel, SVO-pel-K, VS and VSK. problems that arise are not able to distinguish a system that plays as a subject noun and noun who plays as objects.

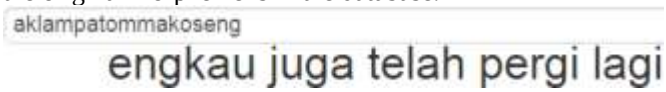
3) Fiter semantic translation system application of the rules of semantic features has been very good. The system has been able to identify the appropriateness of a noun in occupying a fungis sentence. This rule is related to the syntactic rules as described previously, except that this paradigmatic rules can not be incorporated into a translation system.

5. Discussion

a) Application of the theory of grammar in translation system

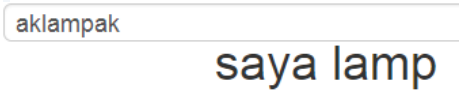
1. Affixation

Rules regarding affixation as forming an intransitive verb, ekatransitif, dwitransitif, and semitransitif in bM entered into the system. Rules in the form of rule prefixes such as Ak-, aN-, si-,ak- + pa-, aK+ pi, ak- + pa-, ak-+ pa-+ si and suffixes -ang, - i. Rules of this morpheme is inserted into the database as a competence of the software itself. With the existence of this rule software is able to recognize a morpheme contained in the bM verbs. However, the rule is not enough, because what is in the database is not the same as the existing data in the sentence. Sometimes morpheme form attached in front of the verb prefix bM transformed into allomorph for their Morphophonemic process. On the verb 'ammempoak' prefix ak- comes in the form of alomorfnya amm-, This means that a system gets input a morpheme allomorph and not the original. The system requires competence regarding these changes, in order to recognize the change and adjust it with the original morpheme is in the database.

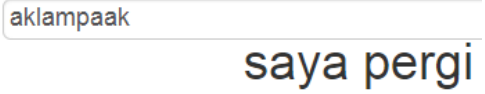


You also have to go again

Translated results show the system has been able to identify every morpheme forming *Lampa* verb 'go' like; -ak prefixes, *Lampa* verb 'go', comitative -tong 'also', aspects -ma 'has', enclitic -ko 'thou', and frekuentif -seng 'again'. The problem that arises is when a verb aklampa 'go' entered by enclitic -ak 'I' which resulted in loss of phoneme/ a / be aklampak.



In the above image system is unable to identify the verb Lampa 'go', because the final phoneme / a / have disappeared, although the system has been successfully identify enclitic -ak 'I'. Apabilsa phoneme / a / was raised in the text, the system can instantly translate text



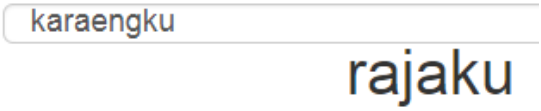
I Go

2. Posesis and determinant

On the system there is data about the possessive in bM – ku,-ta,-nu, and – na. In identifying the possessive noun on bM, the system must first analyze each morpheme Shaper said. The subsequent morpheme that have been identified are given categories and translation based on existing in the database of machine translation.

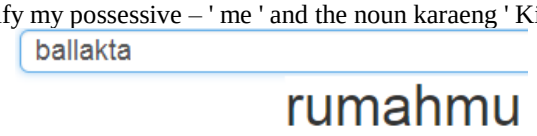
According to the jukes (2006), there is a structure that is not contained in the terpola possessive Makassar. As in the phrase kakangku ' my brother ', on the other hand ballakku ' my house ' not * ballangku, another example that such is bainengku ' my wife '. This is a challenge for machine translation to identify problems that are not patterned like this.

The other problem is the possessive – ta has three meanings, namely; you, we, and we. When the system gets a noun possessive side by side with ta-, then the system will give you the meaning of the third. Used will determine the precise meaning directly from the possessive. The system cannot determine the appropriate meaning because the system only see from the structure of the text and not on other aspects.



My king

The picture above shows the translation from the noun attached to it prosesif – ku '-ku '. The system has managed to identify my possessive – ' me ' and the noun karaeng ' King '



Your house

The picture above shows the translation of noun possessive attached to it – ta '-us '. The system has not been able to provide the appropriate meaning of the word, possessive – ta ' us ' which is attached to the noun *ballak* ' House ' is translated as ' mu ', this is because the system has not been able to provide the translation of the morpheme that has a double meaning.

According to the Jukes, 2006, Makassar have determinants -a ' it ', which has the form of an allomorph – ya ' it '. When a-determinant meeting with morpheme ending in a consonant, then the determinants – a ' it ' do not experience changes, such as; ballak ' House ' = ballaka ' House ', pasarak ' market ' = pasaraka ' the market '. If the morpheme berfonem met with the end vowel/a/in addition it will be like; the stones ' stone ' = stone stone ', ' tape ' tape ' = tapea tape ' it '. But if a determina – a ' it ' meet the morpheme fonem end of the vowel/a/then it will happen like geminasi; the mata of the ' mata ' = matayya ' eyes ', ' River ' binanga = binangayya ' the river '.

The rules regarding the above determinants have been applied on the system terjemahakn. In identifying the determinants of advance system split each morpheme Shaper said. The system has recognized the determian – a ' it ' and alomorfnya – yya ' it '. The subsequent morpheme that have been identified are given categories and translation based on existing in the database of machine translation.

pakjagayya

penjaga itu

Watchman

The picture above shows the translation from the noun attached to it – a determinant of which came in the form of-yya. The system has successfully identified the determinants – a in the form and nominal yya-pakjaga

3. The application of the rule syntax

So that the machine can determine patterns of bM machine must be informed of the results that have been obtained in the previous stage, whose engine has obtained information on the category of the morpheme morpheme analysis and on the type of phrases on the analysis phrases. The fundamental difference between bM and bI that is located at the position of the subject. Engine task here is to divert the subject position of the bM located after the verb to verb as future patterns on bI. Next determine the living engine based on rules that are given to him to determine the function of each phrase. The machine performs the process of segmentation based on function S, V, O, K, the engine was given the rule about the categories that have the privilege to occupy a function in the sentence.

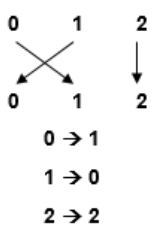
The translation is done on software translation follows some components of the transformation theory of phrase structure rules as generative and semantic features. In addition the theory of tagmemik applied to explain the elements that formed the words/sentences, analyze every element of functional structure-forming sentences, describe the possibility of a functional predicate structure Center that was filled by verbs accompanied by companion to the right and the left layout layout each recharged by a specific category and explain the role of semantic difference that he retained

kamu juga sudah membawa lagi ikan di rumah ku

You've brought more fish in my house

Anng	erang	tong	ma	ko	seng	juku	ri	ballak	ku
Pref	V	Kom	Asp	Enk	Fre	N	Prep	N	Poss
Ø	membawa	juga	sudah	kamu	juga	ikan	di	rumah	ku
0	1	2	3	4	5	6	7	8	9
0,1,2,3,5			4			6			7,8,9
	V		S			O			K
	0		1			2			3

S	V	O	K
1	0	2	3
Kamu	juga sudah membawa lagi	ikan	di rumah ku



0 → 1

1 → 0

2 → 2

The picture above how to expose the translation system in analyzing the input sentences by combining the two theories of grammar that is grammar tagmemik grammar and transformation. In general there are seven levels conducted by the system so that the input text can be translated, the stages are:

1) Identify the morpheme

This stage system identifies any morpheme that is present in the input text and customize it with the data system. The picture above shows the system has identified 10 morpheme that is, anng-, erang, tong, ma, ko, seng, juku, ri, ballak, and ku-.

2) Determination of the morpheme

The subsequent morpheme that have been identified are given categories correspond to the data system, prefix angg-, verb-erang, komitatif tong, aspect ma, enklitika ko, would frequently seng, nouns juku, prepositions ri, nouns ballak, and possessive –ku.

3) Indeksasi category

Indeksasi is the process of granting the order number for easy system in analyzing the data. Morpheme that has been categorised by the number sequence of the given system or indeksasi. [0] prefix angg-, [1] the verb erang, [2] komitatif tong [3] aspects of the ma, [4] enklitika ko [5], would frequently seng, [6] noun juku, [7] preposition ri, [8] noun ballak, and [9] possessive – ku.

4) Segmentation based on function

In this study the segmentation based on function is the process of mapping categories based on their function in a sentence. In the picture above the system provides four segments i.e., segments of the V, S segment, segment, and segments O k. system include categories that have been indexed previously into segments that have been available on the rules of the system, [V: 0, 1, 2, 3, 5], [S: 4], [O: 6], [K: 7, 8, 9]. See that category with an index of 4 has been entered on the segment S.

5) Indexation segment

then the system of indexation of the segment contains an index, [0] V, [1] S, [2] O, [3] K. indexation segments useful in the transfer pattern

6) Transfer of segment patterns:

Under the existing rules him switch system that has been segmented pattern, the pattern in question is 0 = 1, 1 = 0, 2 = 2, 3 = 3.

7) Translation.

This final stage of translating system based on the rule pattern that has been obtained by the system.

b) Application of the theory of grammar in solving problems in software translation paradigmatic bM to BI

Solving problems is paradigmatic in machine translation is by applying one part of the theory of generative transformation is semantic features. This feature is useful semantic give hallmark of every noun and verb in order to align the verbs and nouns. For not all nouns can function as a subject when viewed verbs that accompany him, as well as objects, not all nouns can function as an object based on a verb that belongs to him. But all that can be structurally acceptable.

This system has been able to implement semantic features although not yet at the maximum in the process. Every good word noun and verb are given the feature semantiknya. In this system features the semantic difference is given to the noun is animate and lifeless as for the verb there is some sort of features provided good it associated object or subject as well

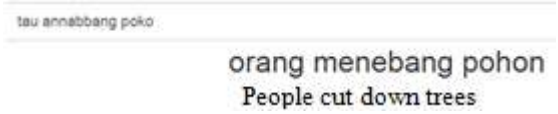
as the type and subtype verbanya. The type of verb that is provided by this system amounted to three (State, process, and action) as seen in table 10. The third type of each action type has subtypes, have such subtypes; movement, displacement, and of speech as seen in table 10. Furthermore, each subtype has a sub-subtypes, for example for the displacement of subtype has a sub-subtype in the form of display, creation, touch, consumption, pieces, punch.

Semantic types associated with the subject verb if there were animate and inanimate. Subject animate like humans and animals and to inanimate objects such as plants and. In connection with the object, there are animate and inanimate. Animate objects are like humans and animals and to inanimate objects such as plants and. Each verb must have a provision like what subject and object in accordance with the type of verb.

For example, two nouns *poko* 'tree' and *tau* 'person' each given a semantic features as shown below. Noun *tau* 'person' is given semantic features poko animate and inanimate. Furthermore, to the verb *annabbang* 'cut down' given semantic features action type, subtype displacement, and sub-types of pieces. Related to the subject of the verb is featured human animate and inanimate object is the plant.

Poko 'tree' ⟶ : -animate, plants
Tau 'people' : + animate, human
Annabbang 'cut down': action, movement, cuts the subject + animate humans,
objects⟶ animate plants.

The picture above shows the system rejection of the subject and the object of the verb annabbang 'cut down' due to feature on the subject and the object of the verb does not correspond to the input sentence. Annabbang verb 'cut down' requires that animate human subjects, while the input sentence which fill the position of the subject is a noun which featured a semantic lifeless plants. Similarly, the object that is being rejected, because the sentence input disebankan provide human animate objects.



The picture above shows the acceptable translation, because the subject and the object in accordance with the semantic features which are owned by the verb.

6. Conclusion

The number of rules that are used when software-based grammar translation was made might be the reason why the machine translation that there are currently only using statistical methods, because the statistical methods do not involve a lot of grammarians (liguist) and the rules of grammar are complex. especially if you want to create a multi-language translation software will be very difficult for programmers to make it. However, the rules of grammar can be coupled with statistical rules so that it can generate a better translation.

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Author Profile

Andi Agussalim born in Palopo on March 17, 1987. Address Berua Beautiful Earth Housing Block C1 / 1 Village Pai, District Biringkanaya, Paccerakkang Daya, Makassar. Andi Agussalim S1 graduated West Asian Literature, Faculty of Letters, University of Hasanuddin in 2009, S2 Linguistrik Graduate University of Hasanuddin in 2012 and now continuing doctoral education (S3) at the University of Hasanuddin. Andi Agussalim now works as a lecturer at the Department of Arabic Literature Faculty of Letters, University of Hasanuddin.