

# Retrans: Regional Language-English Translator Machine Based on Artificial Intelligence (AI) for The 10 New Bali Regions

Naufal Siddiqi Nasrullah<sup>1</sup>; Griselda Gian Heris Herdina<sup>2</sup>; Nurul Aini<sup>3</sup>

<sup>123</sup>English Education, State Islamic Institute of Kediri. Jl. Sunan Ampel No. 7, Ngronggo, Kediri, 64127, East Java, Indonesia.

Corresponding author

[inasrullahnaufalsiddiqi@gmail.com](mailto:inasrullahnaufalsiddiqi@gmail.com); [griseldagian285@gmail.com](mailto:griseldagian285@gmail.com); [florida\\_aini@iainkediri.ac.id](mailto:florida_aini@iainkediri.ac.id)

**Abstract:** This study aims at scrutinizing the productivity of translation communication media as an intermediary for information exchange needs to be significantly improved, more in the middle of the era of the industrial revolution 4.0 which enroll automation and data exchange using the internet in the process of search websites, data and information analysis and cloud services. This is in line with the current era of technology 5.0 which brings big impact in all lines of life. Such facilities can be integrated into innovation of Regional Language-English translation machine, it can be enhanced through innovation of machine translation based on artificial intelligence (AI), the one of innovation based on AI is RETrans, to assist foreign tourists and local residents in building effective communication when visiting the 10 new Bali area. This research discusses the innovation based on integration between learning English and the sophistication of AI which will have advantages over previous teaching techniques. The article limits to discuss about how this AI system operates to apply machine translation specifically in 10 new Bali regions. This research discusses innovation from machine translation platforms to integrate machine translation media with AI sophistication.

**Keywords:** translation machine, technology, 10 new Bali, Artificial Intelligence (AI), RETrans.

## Introduction

The process of translation is a cognitive procedure that occurs in humans, across cultures and languages. In carrying out a multidisciplinary approach, translation theory must integrate several of these aspects. Procedurally, a translation can be seen in two parts, the first is choosing an approach method, the second is when we translate there are several stages that must be passed (1) the SL text level, the language level; (2) referential level, object and event level, real or imaginary, visualizing and constructing, and other important parts, namely understanding and reproduction processes; (3) the level of cohesiveness, generalization, and grammatical, which traces the flow of thought, tone of feeling (positive or negative) and various presuppositions of the SL text. This level includes understanding and reproduction: presenting the overall picture, which we may have to suit the

language level; (4) the level of naturalness, from the language that is appropriate for the writer or speaker in a given situation.

Language exchange is something that cannot be avoided in cultural exchanges between countries around the world, there are cultural and language differences between countries, so it is very natural that there are some obstacles in building communication between ethnic groups with different language systems. With the advantages of the current translation system, various ways to improve the quality of translations that are good and really always being improved, of course Artificial Intelligence plays an important role in improving the world of translators. The quality of translation services from machine translators currently has high accuracy and cohesiveness with the latest system, namely artificial intelligence (AI). AIs' references include supercomputer, computer with power great processing cognitive, and

functional abilities like a human interacting with a supercomputer (Perez et.al., 2018). In this machine translation based on AI will integrate (Wahyu and Teguh, 2020). The field of translation with computer science, which is done by computers (Lin and Paul, 2009). It can be said that machine translation is an automatic translator (Irfan, 2017). During the translation process, the machine works automatically. The system converts source text in a certain language into another specific target text. When in the translation process, the machine will automatically detect and change the source text in a certain language into another specific target text.

In the previous study explains the optimization of machine translation updates by deep neural based on AI by Xiaohua (2022). Other research also describes the development of AI-based detection of machine translation by Xuenting and Xing (2021). Research conducted by (Zhu, 2022), explains that At present, machine translation methods based on neural networks have become an important development direction for machine translation. Research by (Okudono et al., 2020), also reviews the improvement of AI-based translation systems with deep neural networks (DNNs) and recurrent neural networks. Even so, this research will explain the concept of machine translation from regional languages to English based on AI in 10 New Bali regions which can make it easier for local and foreign tourists to interact with local residents. These conveniences will be packaged in an application that contains features according to user needs.

With the existence of research on machine translation based on AI, this will be very useful for the development of the tourism sector in Indonesia. This article discusses AI-based machine translation to improve Indonesia's tourism sector so that it is better known to the world. 10 New Bali with different regions and of course different languages and cultures will greatly support foreign tourists to get to know and learn local culture if an easy and flexible translation application is available. With an AI-based translator application, it is hoped that foreign tourists can learn local culture with local residents in a fun way. Communication between foreign tourists and local residents will be better established.

## **Materials and Methods**

This article using conceptual design for research design which is an early phase of the design process, in which the broad outlines of function and form of something are articulated. It includes the design of interactions, experiences, processes, and strategies. It expected to help local and foreign tourists in exchanging language information with the natives of the 10 new Bali areas.

By this concept, perhaps it can be reviewed by related tourism sector parties so that they can develop innovations from the 10 New Bali regions which can make it easier for visitors to communicate. This is also a form of introduction to the local language culture of each region and can add to the attractiveness of tourists

## **Results and Discussion**

### **Translator Machine based on Artificial Intelligence (AI)**

In the current era, language is an absolute requirement for humans to exchange information as well as a bridge of communication. The process of translation becomes a very important process because it is an important means of cross-language communication (Liu et al., 2021). In today's era, where language and information develop very broadly and quickly, human translation can no longer fulfill high-speed cross-language communication. Currently, the translation process focuses on developing into a high-tech artificial intelligence (AI) technology (Sefer Kurnaz, n.d.). With the development of various computer and internet technologies MT is gradually improved and widely used. Machine translation (MT) methods are generally divided into three types: rules, examples, and statistics. The rule method dominated MT before 1980. This method generally uses vocabulary rules, conversion rules, and syntax generation rules and derives techniques such as text processing, syntax analysis, and dictionaries (Agüero-Torales et al., 2021). However, in today's era, because the amount of information in the language system and the speed

of information interaction have increased drastically, so the limited rules and complicated operations created manually in the rule method have gradually failed to adapt to the new environment of language information in the current era (Herbig et al., 2019).

There is a difference between MT technology and rules technology, rules technology relies more on bilingual corpus inventory, and target languages are generated through in-corpus matching. The rule technology also has some limitations, such as high labor costs and low matching rates (Guo, 2022). The essence of the statistical translation method is to collect and statistically analyze a bilingual corpus. Due to data limitations, this method has obvious drawbacks when dealing with distance dependent sentences and paragraphs that have strong contextual relevance.

### The 10 New Bali Regions

The Minister of Tourism and Creative Economy (MENPAREKRAF) Sandiaga Uno said that previously, Indonesia's tourism sector only depended on the Island of the Gods, aka Bali. However, over time and seeing Indonesia's enormous tourism potential, the Government has established 10 new tourist destinations, namely the 10 Priority Tourism Destinations or often called the 10 New Bali regions.

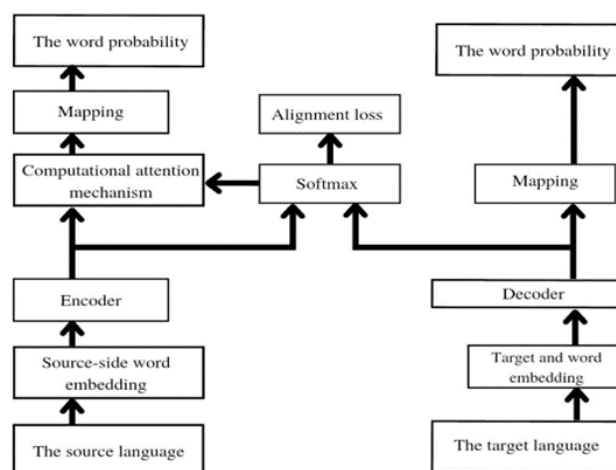
10 New Bali regions is a government program to develop 10 priority tourist destinations to boost the distribution of Indonesian tourism. The development of 10 New Bali regions is also expected to create jobs in 10 priority tourist destinations. The 10 New Bali regions consist of Mandalika (West Nusa Tenggara), Morotai Island (North Maluku), Tanjung Kelayang (Bangka Belitung Islands), Lake Toba (North Sumatra), Wakatobi (Southeast Sulawesi), Borobudur (Central Java), the Thousand Islands (DKI Jakarta), Tanjung Lesung (Banten), Bromo (East Java), and Labuan Bajo (East Nusa Tenggara).

In preparing the 10 new Bali regions to become tourist destinations for foreign tourists, machine translators are needed that cover regional languages in these 10 places, Retrans by using Artificial Intelligent can be an alternative to

creating an application that makes it easier for foreign tourists to learn local culture while enjoying the beauty of nature in 10 New Bali regions.

## Discussion

### RETrans Translation Computing Model



**Figure 1:** Alignment network optimization model (Computational intelligence and neuroscience), by Xiaohua Guo.

The encoder consists of a neural network. It is used to input information and can map the source language in the encoder so that it can encode the sequence information of the input text (Ren, Su, and Wu (2020), Yao, Kanai (2020)). Then there is the decoder, also consisting of a neural network which aims to obtain the output sequence with the highest probability. The higher it is, the more reasonable the results of the translation sequence are (Ghahnavieh (2019) and Wang et.al. (2020)). In decoding, the decoder will automatically look for the maximum probability. There are two methods in the search process, namely complete search and stepwise search (Lara, Farbiarnz, and Valencia (2020)). Step by step search is intended to maximize all probabilities and word order. Step by step search is to find the maximum probability of the current time sequence and get optimal solution (Mohammed, Marzouk, and Zayed (2020)).

### Design optimization method

Word alignment must be conventionally aligned (when the user enters the source language) in order to produce sequential and maximum translation results. In the process of translating

words one by one will be influenced by the context of information at different times according to the search gradually. In this AI-based computing system, it will automatically adjust incoming or outgoing data based on the source language provided by the RETrans platform. This will be very efficient and make it easier for application users to operate it.

### Translation Application Scheme

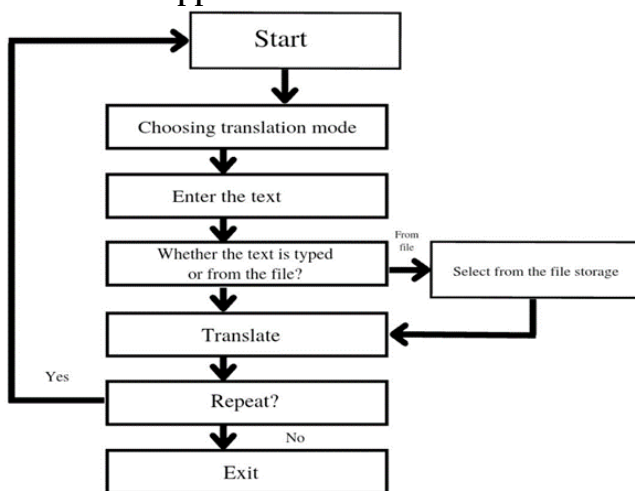


Figure 2: Translation application scheme

For the way this application works is quite simple and easily understood by the general public. First, the user will be presented with an early "start" view for translating. After pressing the "start" button, users will select translation modes from Batak, Malay, Sundanese, Javanese, Sasak, Pulo, Arai, or Moro. Then, the user had to type the local language that was to be translated into English. The user will be offered to translate in a type or visual form. If a user chooses through the picture, then the user can enter a file from SD card. After inserting the word /media, users can translate the vernacular into English. If the user wants to repeat to translate, simply press the "delete" button, then the user will be redirected to the original menu. If a user does not want to translate, simply press "no" button, then the user will quit the application.

### Conclusions

With the massive development of AI and its use life in everyday, Indonesia must take advantage of

it, especially in the tourism sector. ReTrans as a platform that offers local language translation services for 10 new Bali tourist destinations can be a means for foreign tourists to know more about the culture of each region, this of course makes them more enthusiastic about vacationing in these places. ReTrans by utilizing AI technology is able to provide a new breakthrough to help increase the attractiveness of foreign tourists to visit 10 New Bali regions. With this, of course, Indonesian culture is increasingly recognized by the world community.

### References

- A., Ghahnavieh. (2019). time series forecasting of styrene price using a hybrid ARIMA and neural network model. *independent journal of management and production*, 915.
- Abdelkader, E. M., Marzouk, M., & Zayed, T. (2020). a self-adaptive exhaustive search optimization-based method for restoration of bridge defects images. *international journal of machine learnin and cybernetics*, 1659-1716.
- Agüero-Torales, M. M., Abreu Salas, J. I., & López-Herrera, A. G. (2021). Deep learning and multilingual sentiment analysis on social media data: An overview. *Applied Soft Computing*, 107, 107373. <https://doi.org/10.1016/j.asoc.2021.107373>
- Herbig, N., Pal, S., Vela, M., Krüger, A., & Genabith, J. (2019). Multi-Modal Indicators for Estimating Perceived Cognitive Load in Post-Editing of Machine Translation. *Machine Translation*, 33(1-2), 91-115. <https://doi.org/10.1007/s10590-019-09227-8>
- Irfan, Muhammad. 2017. "Machine Translation," *Researchgate.net* Oktober. [https://www.researchgate.net/publication/320730405\\_Machine\\_Translation](https://www.researchgate.net/publication/320730405_Machine_Translation). Johnson, Burke, dan Larry C
- Lara-Valencia, L., Farbiarz, Y., & Valencia-Gonzalez, Y. (2020). design of a tuned mass damper interner (TMDI) based on an exhaustive search optimization for structural control of buildings under seismic excitations. *shock and vibration*, 1-19.
- Lin, Grace Hui-chin, dan Paul Shih Chieh Chien. 2009. "Machine Translation for Academic Purposes." *Dalam Proceedings of the International Conference on TESOL and Translation*, 16.
- Liu, H., Li, W., de Bruin, A., & He, Y. (2021). Should I focus on self-language actions or should I follow others? Cross-language interference effects in voluntary and cued language switching. *Acta Psychologica*, 216, 103308. <https://doi.org/10.1016/j.actpsy.2021.103308>

- Manan, N. A. (n.d.). ANALISIS HASIL MESIN TERJEMAHAN.
- Okudono, T., Waga, M., Sekiyama, T., & Hasuo, I. (2020). Weighted Automata Extraction from Recurrent Neural Networks via Regression on State Spaces. *Proceedings of the AAAI Conference on Artificial Intelligence*, 34(04), 5306–5314. <https://doi.org/10.1609/aaai.v34i04.5977>
- Perez, J., Deligianni, F., Ravi, D., & Yanf, G. (2018). artificial intelligence and robotics.
- Q., Ren, Y., Su., & N., Wu. (2020). research on mongolian-chinese machine translation based on the end-to-end neutral network. *international journal of wavelets, multiresolution, and informatiomn processing*, 46-59.
- Sefer Kurnaz, S. B. (N.D.). Bayathl.Pdf. *Journal Of Information Science And Engineering* 36, 309-322 (2020). DOI: 10.6688/JISE.202003\_36(2).0010
- Wahyu, U. & Teguh, S. (2020). Problema Mesin Penerjemah Berbasis AI dalam Proses Penerjemahan Buku Inggris-indonesia dan Solusinya. *Adabiyat: Jurnal Bahasa dan Sastra*, 92-115.
- Wang, J., Li, C., Shin, S., & Qi, H. (2020). accelerated atomic data production in ab inito molecular dynamics with recurrent neural network for material research. *journal of physical chemistry*, 14838-14846.
- Xiaohua, G. (2022). Optimization of English Machine Translation by Deep Neural Network under Artificial Intelligence. *Hindawi*, 1-10
- Xueting, L. & Xing H. (2021). English Machine Translation Model Based on Artificial Intelligence. *Journal of Physics: Conference Series*, 1-6
- Y., Yao., & Y., Kanai. (2020). temperature dependence of nuclear quantum effects on liquid water via artificial neural network model based on SCAN meta-GGA functional. *the journal of chemical physics*, 1-114.
- Zhu, J. (2022). English Lexical Analysis System of Machine Translation Based on Simple Recurrent Neural Network. *Computational Intelligence and Neuroscience*, 2022, 1–10. <https://doi.org/10.1155/2022/9702112>