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NATURAL LANGUAGE PROCESSING IN ARTIFICIAL INTELLIGENCE: ENHANCING COMMUNICATION AND UNDERSTANDING

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Abstract

Introduction- NPL is one of the AI models that have changed the course of AI by including natural language processing abilities. Thus, the study has discussed the possibilities of NPL in order to enhance communication and understanding. In addition, related questions and objectives were discussed based on the topic in the introduction part.

Literature Review- Here, clear challenges and possibilities of natural language processing have been provided through analyses of previous works and critical debates in the literature review. Additionally, studies have developed fresh viewpoints based on literary data.

Methodology- The paper includes a theoretical debate based on ***"The Situated Theory of Language"***. Additionally, a thematic analysis based on the elements that influenced the research's development was offered.

Findings and Analysis- It was noted that the implication of sentimental analysis and consumer perspective was found to be beneficial for the NPL implication at a mass level.

Discussion- The study's discussion section covered each of the study's results in detail and also included a separate discussion of the findings.

Conclusion- The analytical section concludes the overall analysis. A summary of the study's overall results is also provided.

Keywords: Natural Language Processing, Artificial intelligence, Enhancing Communication, Enhancing Understanding, Sentimental Analysis

Introduction

Natural language processing (NPL) is used in order to provide machines the ability to understand and process the natural human language. According to the opinion of Liu et al. (2023), with the help of NPL communications with the machines have become convenient. Therefore, it can be contemplated that through analysing, interpreting, and producing language similar to that of humans, AI systems can improve the smoothness and intuitiveness of interactions.

During the analysis of the past literature, different issues associated with the use of NPL were identified. As suggested by Dreisbach et al. (2019), cost efficiency is one of the major factors that impact the implication of the NPL. In addition, the use case of the same is limited for the time being. hence, ROI is a major factor that needs to be considered at the time of implementing NPL. Additionally, as NPL models are in the development phase, there is a certain amount of risk associated with the implication of the same.

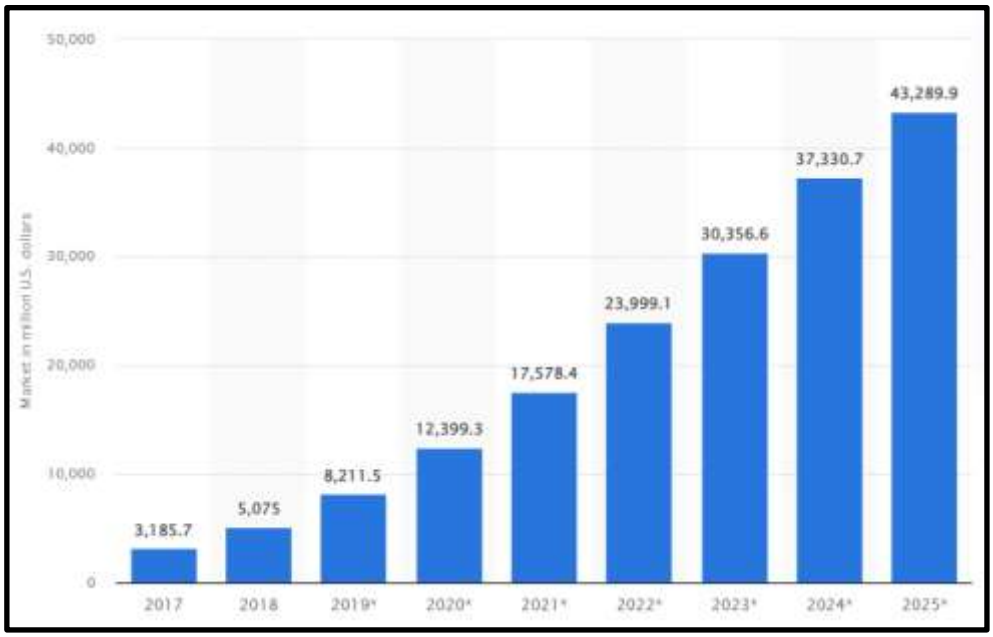

Figure 1: Global NPL market revenue projection

(Source: Statista, 2022)

Figure 1 of the study is associated with the revenue projection of the NPL market globally. According to the statistical data it can be seen that in 2017 the global market for NPL was 3185.7 billion USD (Statista, 2022). Additionally, the market increased to 5075 billion USD in 2018 (Statista, 2022). Based on the growth of the market it was projected that the market of NPL is going to be 43283.9 billion USD (Statista, 2022). It can be contemplated that a gradual and steady growth in the market is expected. Such a growth pattern justified the rationality and intentions of the study.

Aim

The primary aim of the study is to discuss the possibilities of NPL in order to enhance communication and understanding

Research Objectives

RO1: To analyse the factors of NPL that can improve communication and understanding

RO2: To discuss the factors impacting the implication of NPL for enhancing communication and understanding

RO3: To understand the possibilities of NPL for improving communication and understanding

RO4: To suggest tangible solutions for countering the issues that are hindering the implication of NPL for improving communication and understanding

Research Questions

RQ1: What are the factors of NPL that can improve communication and understanding?

RQ2: How to discuss the factors impacting the implication of NPL for enhancing communication and understanding?

RQ3: What are the possibilities of NPL for improving communication and understanding?

RQ4: What are the tangible solutions for countering the issues that are hindering the implication of NPL for improving communication and understanding?

Literature Review

Foundation and factors of NPL for communication and understanding

Through the analysis of past literature, it was noted that the foundation of NPL was laid with the incorporation of AI. According to the opinion of Khurana et al. (2023), Linguistic theories that decipher the structure and meaning inherent in human language serve as a source of inspiration for NLP. moreover, the basic idea of incorporating NPL in AI is drawn from the natural conversation of humans.

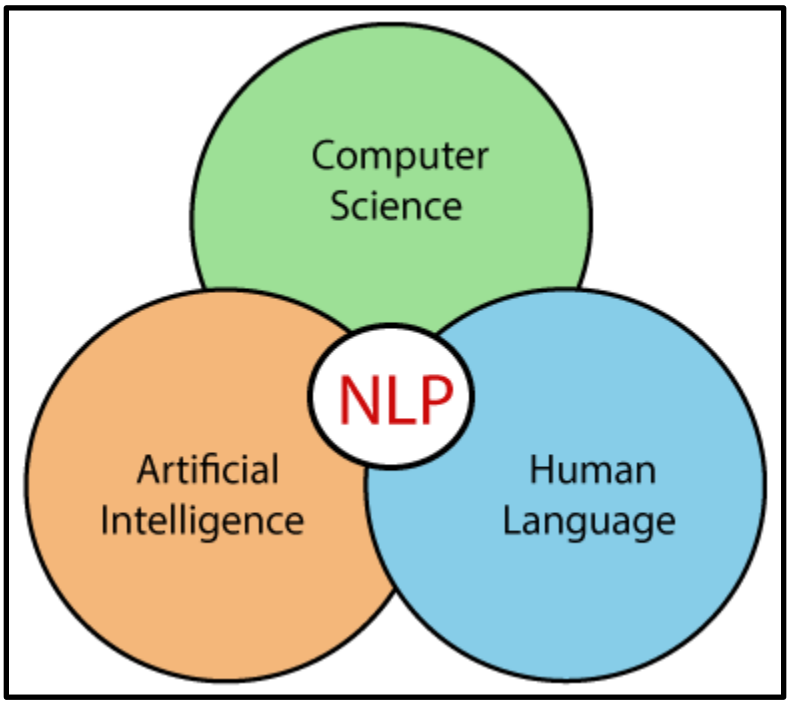

Figure 2: Foundation of NPL models

(Source: Ladányi et al. 2020)

Figure 2 of the empirical analysis indicates the foundation of NPL where sources of inspiration are mentioned. As per the views of Ladányi et al. (2020), NPL is a product of AI, computer science, and human language. Thus, with such understanding improvement in the process in order to match the natural human processing abilities is aimed at NPL. Moreover, through the discussion and past literature analysis, it can be comprehended that using sentimental analysis can enhance the communication and understanding of the computer models and NPL can be enhanced.

Challenges associated with the implication of NPL

Through analysing the past literature associated with the NPL it was noted that there are some major factors associated with the implication of NPL. As commented by Öztürk et al. (2020), cost-effectiveness is one of the major factors that impact the implication of NPL. Moreover, a scene of uncertainty and use cases are there with the implication of NPL. Therefore, it is challenging to implement AI for the improvement of communication. On the other hand, Kang et al. (2020) argued that the used cases of NPL are developing at lightning speed thus ROI

is not a major issue in implementing NPL. thymus it can be understood that the till now cost-effectiveness is a major issue that can be resolved with the mass use of NPL.

Additionally, AI is still in the development phase therefore, certain risk is associated with the same. According to the opinion of Chowdhary & Chowdhary (2020), data security and protection is one of the major issues that is associated with the implication of NPL models. On the other hand, Dreisbach et al. (2019) argued that the ability to identify text and conduct a conversation has a mechanical touch to it. Thus, it is one of the hindering factors for implementing the NPL model.

Theoretical framework

The Situated Theory of Language

According to the Situated Theory, the implication of NPL can be understood in a divorced manner. As per the opinion of Eang & Na (2020) the situated theory of language suggests that without considering the context in which it is used, language cannot be properly comprehended. Thus, based on the context language can be understood in a subjective manner.

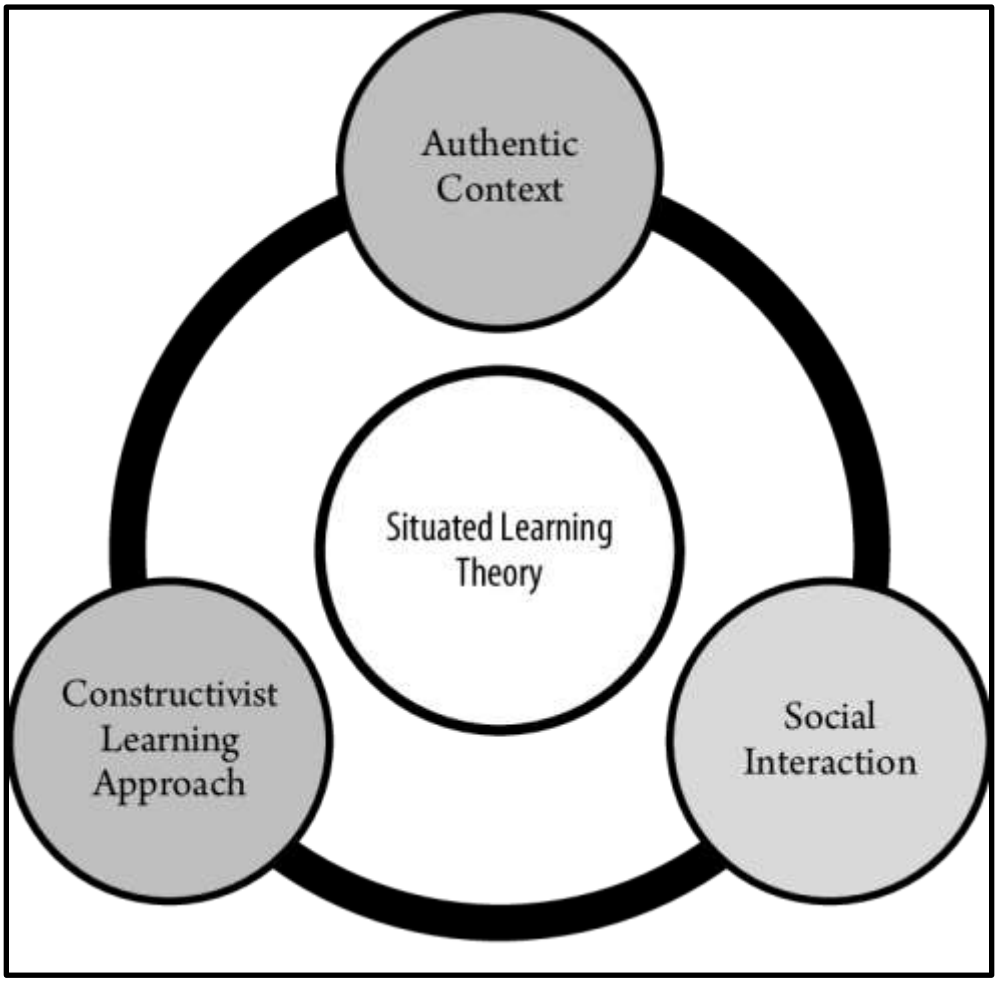

Figure: Situated Theory of Language

(Source: Hengst, & Sherrill, 2021)

The above illustration is associated with the situated theory of language where different approaches and context of language is shown. It can be seen that the subjective nature of language depends on the authenticity of the context, social interaction, and constructive learning approach. Thus, based on the factors NPL model can be improved in order to understand the holistic meaning of language Hengst, & Sherrill (2021). Moreover, using the situated theory of language for understanding NPL indicates an amalgamation of NPL models with sentimental analysis models for enhancing communication and understandability.

Literature gap

During the past analysis, it was noted that all the literature has spoken about the risks and possibly implications of NPL. However, concise literature addressing the personal thread of data and fields of implication was not found. According to the opinion of Xie, Qin & Juang (2021), implementing models that can interact with a person can store the personal data of that same person. Thus, such factors of AI models become a boundary of changing user perspectives. Therefore, gaps related to security and data storage were noted in the literature. Moreover, such issues were not discussed in relation to user interaction and perspective.

Methodology

An empirical analysis methodology examines several approaches taken in the course of producing outcomes by following the objectives. Consequently, a "***Theoretical discussion***" method was used to examine the implication of NPL for enhancing communication and understanding (Eang & Na-Songkhla, 2020). Furthermore, a comparative examination of the instructional strategies is the main aim of the empirical study. A comparative analysis of different factors associated with the implication of NPL for communication and understanding is presented in the study. In order to consider the possible influence of NPL in communication and understanding, discussions on ***"The Situated Theory of Language"*** were used. Furthermore, unique research is offered by means of a streamlined investigation of several elements, including models, technological advancement, and the mass implication of NPL models.

Theoretical analysis

Findings and Analysis

Theme 1: The use of sentimental analysis in the amalgamation of AI can improve communication and understanding

As per the situated theory of language, it can be understood that in order to improve the implication of AI, understanding the context is essential. According to the opinion of Holler & Levinson (2019), Artificial intelligence systems can identify the attitudes and feelings conveyed in the text by using sentiment analysis. Thus, the interactive nature of the NPL models can be enhanced with the implication of sentimental analysis. Moreover, while negative thoughts might elicit sympathetic and supportive reactions, positive sentiments can elicit affirmative and encouraging responses. Based on the understanding it can be stated that an experience that is more engaging and user-friendly can be achieved with sentimental analysis.

In addition, according to the situated theory of language, a language can have contextual meaning. Moreover, for making an interactive medium of conversation it is important to have

customized responses. According to the opinion of Guo et al. (2020), NPL can be used in order to provide a better consumer experience. Moreover, by customizing services to match user expectations and desires, an understanding of user attitudes facilitates more effective communication. For such effective communication, it is important to include sentimental analysis in the NPL models. Hence, it can be understood that Sentiment analysis combined with AI can enhance comprehension and communication.

Theme 2: Including ethical considerations for NPL can enhance human communication and understanding of NPL

Aside from ensuring ethical AI development, the incorporation of ethical issues into Natural Language Processing (NLP) also acts as a stimulus for improving human communication and NLP comprehension. According to the research outcome of Zhao et al. (2021), the business of an NPL model depends on the training model for the NPL models. Therefore, with a clean and concise dataset, it is possible to deliver a reliable NPL model that has ethical considerations integrated into it. Moreover, preventing prejudice and guaranteeing equal results depend heavily on the moral integration of fairness principles within NLP. hence based on ethical understanding a concise conversation can be achieved. According to the opinion of Corcoran & Cecchi (2020), transparency in the NPL model can be improved by using reliable models for developing a reliable model and ethically sound model for the users. Transparent natural language processing (NLP) technologies foster user confidence by demystifying technology and making the underlying processes understandable. Hence, it can be concluded that human communication and comprehension of NPL can be improved by taking ethical issues into account.

Theme 3: Challenges such as cost and usability can hinder the implication of NPL for enhancing communication and understanding

Through the past analysis of different models, it was noted that using NPL models is associated with different challenges. According to the opinion of Zhang et al. (2020), cost-effectiveness is the major and primary issue of implementing NPL models in enhancing communication and understanding. Therefore, mass implication of the model is the possible solution for countering such issues. It was noted that infill is in the development phase. Thus, presence of bugs and challenges are there. Through the mass implication, those bugs and challenges can be highlighted and countered with technological solutions. In addition, it can be stated that implementing such models in a wider perspective can reduce the cost of the same.

Additionally, as per the views of Medina, Papakyriakopoulos & Hegelich (2020), data security is a major threat in implementing such AI models. Therefore, achieving data security is a major challenge for preventing in order to enhance communication and understanding. Data security is a secondary challenge that is faced by all the models. However, NPL models specifically identify such challenges as introducing a person and having personal data of that person. Thus for achieving mass implication, it is essential to counter such threats.

Theme 4: Changing user acceptance and perspective aid to improve the implication of NPL for improving language processing

For the mass usage of NPL models and implementing the same in different daily tasks, user perspectives are essential. Moreover, in order to understand the NPL model based on situated theory of language it is important to have a wide user acceptance. According to the opinion of Cambria et al. (2020), developing a user-friendly and intuitive system can be beneficial for user interaction and improving the same for developing mass implication. In addition, systems need to be developed with respect to providing positive user interaction. Thus, based on the positive user interaction manipulation user perspective and aiming for an amass implication is possible. In the process of achieving a positive user experience, an improved system can be developed. Furthermore, according to the opinion of Galassi, Lippi & Torroni, (2020) changing user perceptions is also greatly aided by education and awareness initiatives. Through such integration, it is possible to deliver knowledge related to US cases of NPL.

Discussion

A theoretical analysis associated with the use of the NPL model for enhancing the communication and understanding of the model is delivered. Moreover, through the analysis factors of the same are discussed and analysed. For instance, sentimental analysis was found to be an essential factor for developing a concise NPL model for mass implication. Moreover, it was noted that sentimental analysis can provide a subjective understanding of the NPL model (Guo et al. 2020). According to the situated theory of language, it was contemplated that understanding the subjective nature of language can provide an age to NPP models. It was found that sentimental analysis can provide a contextual idea that can be converted into a response to NPL models. In addition, there were some challenges that were noted at the time of past literature analysis. Based on the challenges it was noted that the cost-effectiveness of NPL is a major issue for the delivery of quality in communication and understanding (Zhao et al. 2021). Additionally, it was discussed that the appropriate use of the NPL model can increase user interactivity and aid in the mass implication of NPL models. Thus, a detailed and coherent analysis to discuss the possibilities of NPL in order to enhance communication and understanding is presented. Moreover, tangible solutions are discussed in the study for the same.

Conclusion

Thus, theoretical analysis is conducted to discuss the implication of natural language processing for enhancing communication and understanding. It was found that through the implication of sentimental analysis natural language processing can be improved. Moreover, the challenges and risk management of NPL can be countered with technological advancements. In addition, it was noted that human communication and comprehension of NPL can be improved by taking ethical issues into account. Ethical considerations deliver a certain sense of responsibility for the NPL models. Furthermore, it is important to build systems that facilitate pleasant user engagement. Therefore, it is feasible to aim for an accumulation consequence based on the positive user interaction manipulating user viewpoint. Enhancing the user experience can lead to the development of a better system. Moreover, the findings of the study can be concluded

through the suggestion of implementing sentimental analysis and mass implication of the NPL models for enhancing communication usability.

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