**IT Technologies: Natural Language Processing**

**What does it do?**

Natural Language Processing (NLP) stems from a branch of artificial intelligence, it gives computers the ability to understand the text and spoken words similarly to humans. A combination of both computational linguistics and the human language, along with statistical machine learning has allowed this new technology’s birth. NLP is the driving force behind many language-based computer programs. These include applications that aim to translate text from one language to another or anything that can respond to spoken commands as well as many others.

The two largest advancements in the evolution of natural language processing were made in 2017 and 2019. The first considerable development came as a new form of deep learning model called Transformer. This made it possible to parallelize the AI training more efficiently, which resulted in a far more accurate and improved product. A short two years later, another implementation of Transformer was made. Pioneered by Google in 2019, the architecture of Transformer was greatly improved by their Bidirectional Encoder Representations from Transformers (BERT). After this breakthrough, the depths that NLP could reach were far greater than the average human in many tasks. Now in 2022, there is a fast projected expansion of 20.3% in the next 4 years, and this start-of-the-art technology is looking at one of the greatest futures in the current industry. The future of NLP will heavily rely on the investments of further research within companies such as Google and Facebook.

NLP has many prospects and continues to look promising every day. There will most definitely be avenues where we see this technology more accurately begin to not only read but also write articles and other important news.

An important utilization of NLP is chatterbots or chatbots, which have changed the way we interact with computers. In its most simple form, a chatterbot is a program that simulates and processes human conversation. It allows humans to interact with the program as if it was communicating with a real person. Ranging from the most basic query with a single-line response, all the way to the very sophisticated digital assistance that we see today.

Chatterbots were created throughout the era of digitization. Allowing businesses to free up time by setting up a system where an automated list of questions and responses are communicated to the customer. While they can sometimes be quite frustrating and hated by many, they do save time by answering many frequently asked questions or helping to send the caller to their required service.

The long term aim of NLP is to control the human-to-machine interaction space, and hopefully to the point where talking to a machine is far easier than talking to a human. With more acquisition of data and information over time, the artificial intelligence and tech surrounding NLP will continue to evolve and become more reliable and impactful.

**What is the likely impact?**

NLP helps companies automate processes that would in turn reduce costs or provide insight into improving business strategies. Answer Rocket, software that organizations could apply to their systems, allows staff members or users to access and view specific publicly available company data with search queries that would include natural language. The idea is to make information regarding the company more accessible for all people when they aren’t limited to data that can’t be accessed because they couldn’t word their search correctly. Furthermore, Parlamind is a system that uses NLP to analyse customer communications and automatically answer queries. Analysis of communication can grant businesses with necessary insight into what practices may be failing and why. Additionally, Netomi, another system that uses NLP, automatically grants resolutions to everyday queries instantaneously of everyday support tickets. This effectively allows a company to increase their workforce without actively increasing its headcount, thus, reducing costs for the company and allowing it to be managed more easily.

In contrast, NLP may threaten numerous jobs in multiple industries. Digital Genius, a system that utilizes ML, machine learning, and NLP, assesses common customer service interactions of different businesses to understand their client needs which serve as an example of how a job like a customer service agent may be threatened. For now, Digital Genius can help with queries but will refer to a customer service agent when one is required to handle the call; if software like Digital Genius were to advance further then customer service may become entirely handled by AI (artificial intelligence), thus, rendering customer service agents redundant. According to the World Economic Forum**\*1**, jobs that fall under the financial services profile**\*3**, on average, have a 20.8% share of workers at risk of displacement due to the advancements in technology which is the highest percentage share of workers at risk of displacement amongst all the industry profiles**\*2** mentioned in the text where the mining and metals profile**\*4** is second with a 19.9% average share of workers at risk of displacement. Customer service workers are categorized into the profile of the financial services making them, on average, threatened by technology the most when compared to others.

We are likely to see businesses able to implement solutions according to customer needs and client requirements as data can be gathered and analysed based on customer interactions with the company by utilizing ML and NLP. Although some people will lose their jobs, companies will theoretically be able to place more funds into research and development, quality assurance, production, and more factors that may make their goods and services more affordable and accessible.

**How will this affect you?**

NLP, natural language processing, can affect us in many different aspects of life, whether for convenience or support – both emotionally and physically. NLP allows users to translate text from or to any language they desire which has numerous applications. Users may find themselves looking into taking a holiday to a foreign country to experience something new; where in the past they may have been limited by a language barrier, we are now able to simply input some text whether it be through a keyboard or by speech recognition technology and be granted a result. The emotional well-being of a person can drastically affect their performance of tasks during the day.

Replika AI**\*5** is a chatbot that utilizes NLP to learn more about a user through mutual interaction and, their motto being, a friend who will be there for you, talk, listen, and without judgement 24X7. According to the World Health Organization**\*6**, depression is a common mental disorder that affects an estimated 5% of adults globally – where more women are affected by depression than men. Depression is a matter that needs to be taken seriously and Replika AI aims to contribute to fighting the effort to reduce and defeat depression. Replika is an accessible solution and according to Partap**\*7**, “85% of Replika users find it helpful to ease their anxiety and stress. Simply talking with the app has helped a plethora of users.”, which proves that it is an effective solution that utilizes NLP. Having the Replika chatbot be a free and accessible program for users globally means people have a greater chance of preventing themselves from succumbing to the effects of depression, as a result, may create a slightly more productive society.

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