## What is Natural Language processing and chatterbots

Natural Language Processing, also known as NLP, is the science behind developing systems that allow a computer to have a meaningful conversation with a person using natural language. Natural language in this context means English, Chinese, Spanish etc. languages that are used in normal interactions between peoples of the world. The conversations may be verbal or textual, however voice must be converted to text for it to be passed through software processes and be understood by machines. Common use examples of NLP technology are Apple’s Siri, Microsoft’s Cortana or Amazon’s Alexa, which may be described as conversational agents, virtual assistants or Chatbots and have found widespread acceptance and use in our everyday lives through our mobile devices and connected homes. This technology is being embraced in growing numbers by commerce as a basic customer service agent.

The current state of this technology may be likened to a child just starting to crawl. Although there have been significant advances in the last decade, NLP is still a young technology. These advances have been made possible using Artificial Intelligence and deep learning which has allowed conversational agents to become more lifelike and provide more sophisticated responses. Access to rudimentary chatbots for businesses is very easy, with numerous companies offering templated interaction for sales, support, surveys, recruitment and learning, which can be added to a website or social media in hours, with no need for coding.

Today, many interactions we have with organisations and government departments are initially handled by Artificial Intelligence and chatbots. These can handle increasingly complex queries to completion or transfer to a human agent for more detailed assistance. As may be seen from Figure 1 below, people expect that their likely chatbot interaction will be for basic questions and answers.

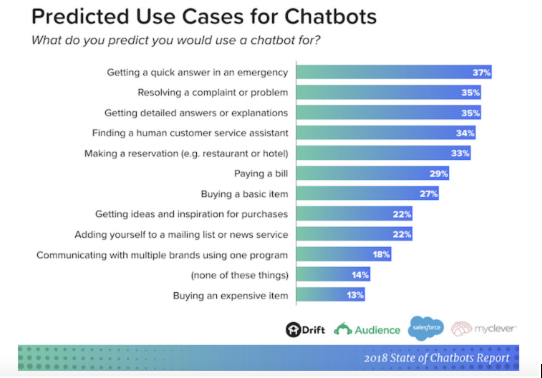


Figure 1(*Potential-Benefits-of-Chatbots-in-2018.png (698×442)*, no date)

Education is also adopting this technology, with chatbots available as course assistants or tutors which can assist each student individually, on their own device and at a pace most suitable to the student, providing there is access to the internet. Students can access assistance at any time of the day or night that best suits them, making it easier to study for many people whose work or other commitments make studying at regular hours a difficult proposition. Language learning is another area of education that is taking up chatbots as teachers and conversation partners, providing live conversations to students to improve their vocabulary. (*Will Chatbots Revolutionise Education?*, 2017)

IBM estimate that savings of up to 30% of the nearly $1.3 trillion, businesses spend on addressing customer requests can be made by going fully automated. (*11 Chatbots Trends to Help Grow Your Business in 2019*, 2018)

This significant amount of money will, drive ongoing research and development in NLU or Natural Language Understanding, the aspect of NLP that tries to understand and interpret the input text, extracting relevant information, and perform a variety of decisions based on its understanding. Humans have been conversing with one another for thousands of years and during this time have built up a knowledge of sentence structure, word meanings, nuances, grammar, context etc. There would be little ambiguity in the sentence ‘I recognise the chair’ meaning a person rather than something to sit on. This is a very basic example of the challenges faced by NLU. Advances in artificial intelligence and deep learning algorithms will improve the experience of dealing with chatbots and their ability to provide increasingly complex responses.

Other than an increased use of chatbots for Retail, HR, Real Estate, Finance, I.T. Support and Customer Services there are projects underway in healthcare that have considerable potential to impact society in a very positive way. One such open source project is a verbal conversational companion for dementia patients which besides being ‘someone to talk to’ aims to identify deviations of conversations that may suggest a degradation of memory function and as such alert carers and medical staff. Another medical related project is a verbal conversation agent called MedWhat which uses sophisticated machine learning to provide increasingly accurate responses to medical questions. (10 of the Most Innovative Chatbots on the Web | WordStream, no date)

## Likely Impact

As stated above there are projects focussing on Medicine, Healthcare, Customer Services and virtual assistants, which will continue to evolve and be adopted into our everyday lives, in some cases without it being apparent. Unstructured data such as social media posts, blogs, and news articles and interviews are being devoured by NLP and AI systems to improve comprehension, make the data more meaningful and enrich the ability for systems to interact “Naturally”. Furthermore, with access to big data, NLP will provide extensive business intelligence from raw data. One example is businesses protecting their brand image by using NLP to identify any negative comments or trends published online, anywhere in the world and allowing the business to intervene.

With NLP becoming smarter, virtual assistants becoming easier to work with and the hectic pace of life making us time poor, we will see increasing adoption of the technology in the home, our cars and in business. Being on hold for 30 minutes or more with a service provider, with that annoying message “you are number 501 in the cue” will be a thing of the past as during peak demand more chatbot instances can be spun up. Standing in the kitchen, trying to remember the best temperature for roast potato’s, will be a thing of the past when you just have to say “Hey Google”.

The impact of advances in NLP technologies will be most felt by peoples of the developed world as they have more ready access to devices and the internet. They will see a change in the way they interact with technology, with friends and family and with businesses, health services and government, as the prevalence of virtual assistants and chatbots, driven by NLP expands.

As the technology matures, call centre employees, receptionists, and sales people may find their positions redundant or their hours reduced with chatbots able to answer the majority of typical enquiries. Recruitment agencies will use NLP increasingly for candidate matching and resume pairing. Chatbots can schedule appointments and deliver job descriptions. Chatbots can work 7 days a week 24 hours a day, with no holidays or sick leave, and live by the millions on servers in the cloud.

Software engineers and data scientists familiar with NLP and chatbots should find an increase in opportunities.

## Affects

The impact of current and emerging NLP technologies on the daily lives of our household, extended family and friends, will largely be positive. We will take advantage of the developing technologies in the ways that have been outlined above. Accessing customer services and interaction with government departments. Perhaps seeking answers to basic medical questions. In our cars we take advantage of technology to find the quickest route to somewhere or verbalise a text message just received and dictate a response. There is also scope to dictate these words and write other correspondence, rather than sit in front of a keyboard. Increasingly we use Google or Siri to play our favourite music rather than sort through boxes of CD’s. We have also started to ask for answers to cooking dilemmas such as the correct cooking time and temperature for that lamb roast. The world of technology is moving at an ever accelerating rate which makes it difficult to know just what will be different next year or the year after, however the experience of the extended family and circle of friends will be not that much different from our own.

## Reference list

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*Will Chatbots Revolutionise Education?* (2017) *InformED*. Available at: <https://www.opencolleges.edu.au/informed/features/will-chatbots-revolutionise-education/> (Accessed: 6 January 2020).