## 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.

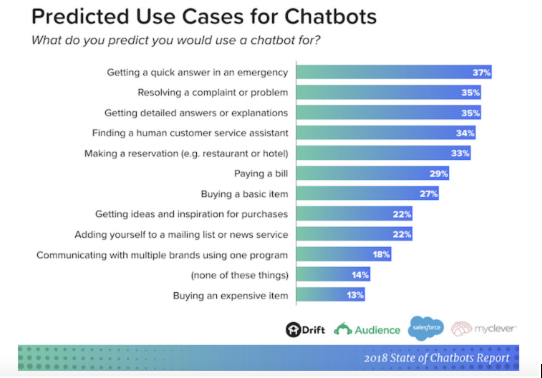


Figure 1(*Potential-Benefits-of-Chatbots-in-2018.png (698×442)*, no date)

Interestingly from Figure 1 is the percentage wanting a quick answer in an emergency. Given the disastrous bushfires currently sweeping Australia and the noticeable increase in tropical cyclone intensity over recent years, governments and councils will likely turn to chatbots and NLP as a way of ramping up the abilities of a call centre at times of crisis without having to provide the additional manpower.

Education is also adopting NLP 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. Advances in artificial intelligence and deep learning algorithms will progressively develop proficiency in identifying and comprehending words and phrases improving the experience of dealing with a chatbot and their ability to provide increasingly complex responses.

## Likely Impact

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)

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

As mentioned in the preceding text our daily lives will be affected by NLP and associated technologies in significant and sometimes subtle ways. Our own household has recently acquired a connected speaker and we are still exploring all the ways it can enhance our lives. From finding the right playlist of music, to connecting with family and friends through voice calls. Of course, we can already do this with our smartphones but here is another gadget that may mean we don’t have to go looking for our phone. I expect it will not be too long before I can ask my preferred virtual assist to give me an update for the day and receive reminders about anniversaries, birthdays, bills falling due and any medical or other appointments, as well as the top news stories. I do very much look forward to being able to just dictate my correspondence and university work without the need to bash away at a keyboard. That will be a joy.

Precious time will be saved to be able to devote to hobbies, sports, walking, entertainment and study. At least that would be the intent, there is a learning curve to acquiring and exploiting any new technology and our little Google Nest Mini has been an exercise in frustration. Before individuals, homes and businesses can fully embrace NLP and associated automation there is the very real need for fast and reliable internet connectivity. Living as we do in a large regional centre, we find it harder than friends and family in the large cities to obtain access to reliable internet. Some family and friends in more rural areas struggle just to get a decent mobile phone signal, so the rates of adoption and the uses they are able to put the emerging technologies to will vary significantly.

## Reference list

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