The past, present, and future of voice assistant technology

" Hi, Google, the weather over the weekend?", " Alexa, where is the closest post office?" These questions had been adapted to our daily life. Voice-based artificial intelligence is here to play an important role in our daily life.

What is voice assistant? Voice assistant is a speech recognizing technology that can provide a service through a particular application. The first tool that becomes digital speech recognition was IBM's shoebox, it was released to the public in the year of 1962, and it could only understand 16 English words. (Clark, 2018) The next development in voice recognition technology came in the 1970s from Carnegie Mellon University in Pennsylvania with the aid of the United States of Department of Defense. That tool named ' Harpy'; it can understand about 1100 English words. After 10 years, A system that not only analyzed individual words, but also entirely word sequence has been developed by the same group of scientists. In the 1990s, digital speech recognition was a new feature of the personal computer. With the launch of Microsoft, IBM and Lernout & Hauspie flighted for customers, Lernout & Hauspie were a Belgium base speech recognition company that went bankrupt in 2001. (Clark, 2018) The launch of the first smartphone the IBM ' Simon' in 1994 laid a foundation for a smart virtual assistant as we have known of today. Siri and Google home voice assistant were brought to the public in 2018 -2011. As of today, voice assistants are now everywhere. Hirschberg and Manning (2015) believe these 4 factors push the improvement of voice assistant: "(i) a vast increase in computing power, (ii) the availability of very large amounts of linguistic data, (iii) the development of highly successful machine learning (ML)methods, and (iv) a much richer understanding of the structure of human language and its deployment in

social contexts."(P261). The voice assistant journey is still incomplete, but we traveled quite some distance from the room-sized computers of the 1950s, to today's automated voice assistant.

What we can do with Voice Assistant? In today's market, there are many different voice assistant's platforms around the world, it might speaks/response different languages, but there is one big same feature they have in common is they are all connected to the Internet. This is also the reason today's voice assistant can respond to a much larger number of commands and questions. This significant feature helps the voice assistant leaned new skills in a second. On the other hand, personal computer had grown cheaper and more powerful, which means, more people can have access to internet, in which they created more information online to be analyzed, scientist can analyze this information to teach voice assistant to understand what's the best answer to certain questions under different circumstances (Matthew, 2018). Another feature that voice assistant stands out is its' ability to do voice command without an app, nor touch anything. Its' voice recognition technologies can initiate a sequence of actions to archive the final goal after it receives a voice command from its user. For example, telling the voice assistant ' Good evening' could start a serial of actions to improve users' quality of sleep at night by dimming the light, adjusting the A/C to a comfortable temperature, playing relaxing music, and double checking and locking all the entrances. We can find all of the devices that can help perform the above task with a voice assistant in today's market.

Voice assistant can bring us tremendous benefits, also a joy to people. Unfortunately its' security and privacy are having a serious problem that can negatively impact its' popularity in the market if the designer could not find a solution. With the voice-active device, anyone with the ability to give commands can ask questions to the devices, and ask it to do the work with or without the user's authorization. There was a reported case that a man's IPAD in his living room would unlock the front door for anyone who stood outside and command Siri to let them in (Tilley, 2016). Google, Amazon, and Apple these big companies are developing voice printing can recognize its' user's voices, or simply put a passcode to confirm the command whether is from the user or not. Privacy is another major problem that voice assistants have to worry today. Due to its' voice-activated based feature, voice assistant must have been listening all day to catch command signal in time. Even though Google, Amazon, Apple all insist they are not recording any conversation unless the user speaks the command to wake up the system. But there are at least one or more cases that happen to record the conversation all the time and send the original data back to Google (Tung, 2017). People like the convenience that voice assistant brings to us, but there are also concerns and issues with today's voice assistant technology. I'm sure the voice assistant has not reached its' stabilization or its' closure time yet.

Google Home is part of my daily life now, this little thing seems awarded to set anywhere in the house, but somehow it adapts to my daily routine smoothly. I started to use it as my washer, dryer timer, then I use it to listen to the podcast in the morning, to look for restaurants, and set up a reminder

for my appointments. I have to admit it does save me quite some time by speaking directly to the device, and it can help you complete it. I think this is the biggest advantage that can explain why voice assistant develops so fast, and become so popular. What about the future of voice assistant? Many companies predict future voice assistant is going to be in the car since there are 77 million of Americans use a voice assistant in their car monthly, due driving should not allow distraction by using touch screens, or smartphone. (Molla, 2019) From my point of view, I'd like to see a big improvement in voice interpreting assistant. Google recently invented a new technology that pair with its voice assistant for real-time voice interpretation. (Palladino, 2017) The system itself is still under developing since it still only can help with day to day conversation, but not professional business or academic use. No matter where is voice assistant's future at, at the end of the day. it will be at a place that can assistant human and benefits us.

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