

The Technological Servants of the Future: Voice Assistants

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IT 104-005

September 23<sup>rd</sup>, 2021

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**Introduction**

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Voice assistants are these advanced pieces of software that possess the ability to converse with the users by utilizing voice recognition, language processing algorithms, and voice synthesis (“What is a Voice Assistant”, 2019) in order to perform different tasks and obey a variety of commands. This astounding technology has managed to relieve the burden of everyday, miniscule tasks whilst also acting as an important development in the history of machine-human interaction. Voice assistants operate depending on their pre-existing tasks and their responsibilities: Siri is able to tell what the weather is in Florida and where the closest high-rated restaurant is located from a handheld mobile, Alexa can play jazz through the whole house, Google Assistant can adjust the lights and temperature to fit the user’s liking (Shih, 2020). Each of these amazing assistants have developed one after the other, being able to carry out more commands and cater to users more efficiently as time goes on. This advancement in Information Technology is significant in today’s society because it has taken up the burden of daily tasks which has led to an increase in productivity and time amongst humans.

However, every technological tool proposes a downside as well. Voice assistants are known for being quite vulnerable to cyber-attacks, as well as recording private user information and audio without permission (Bolton, 2021). This can cause many problems for users: their information can easily be tampered with, there would be a lack of trust between humans and this software, this breach in privacy could potentially put off future users and put the advancement of voice assistants in jeopardy. The flaws associated with voice assistants possess the ability to cause serious legal and security trouble. It is important to uncover the cons of voice assistants so that this software can be fixed and have the chance to advance in the future.

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The future for voice assistants is looking brighter as more Americans everyday commit to owning this type of software. An estimated 1 out of 4 U.S. adults is currently in possession of a smart speaker and a staggering 92.3 percent of smartphone users will be using voice assistants by 2023 (Clearbridge, 2021). People are becoming more reliant on tools, like voice assistants, because there has been a major shift in the world that has to do with technology-human interface. This software is successfully helping users function through daily life by taking up certain responsibilities, which in turn is building the relationship between humans and technology. This essay discusses the current use of voice assistants, the security and legal aspects, the ethical and social implications, and the future in order to analyze the great impact that this amazing software has had on daily life and society as a whole.

### **Current Use**

Voice assistants are software agents that interpret human speech in order to carry out certain commands and provide specific information that is requested by the user (Hoy, 2018). This technology is widespread today and functions to assist many people in different ways everywhere. Voice assistants are integrated into many different devices that people utilize daily: iPhones, iPads, computers, smart speakers, etc. (“What is a Voice Assistant”, 2019). The fact that this software is embedded in practically every device that humans use everyday showcases how advanced this technology has become and its strong influence on human life. Voice assistants, also known as digital assistants and virtual assistants, are the first application that exposes consumers to the power and potential of artificial intelligence, and the spectrum of its capability continues to expand (Shih, 2020).

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There are many different kinds of virtual assistants that exist today and that are used popularly by consumers (Siri, Alexa, Google Assistant, Cortana), and each of them share similar capabilities, whilst also having unique ones. Alexa and Google Assistant have the ability to define routines to perform a set of tasks with a single voice command. For example, when the user says, “Hey Google, good morning,” Google Assistant can execute a sequence of predefined tasks, such as adjusting lights and thermostats, giving weather reports, estimating commuting time, looking up and stating calendar events, providing reminders, playing news, radio, or music, etc. (Shih, 2020). Siri was the first voice assistant to make history and was a turning point in artificial intelligence back in 2011. Siri started out on an iPhone and was called upon by pressing down on the home button. Today, Siri can be summoned just by saying the command “Hey Siri” and is capable of many things: translate, show the weather forecast, look up sports statistics of recent games, find the nearest places to eat, give directions, etc. The possibilities for these virtual assistants continue to become endless. Voice assistants have even become popular among the blind or vision impaired because they are now able to command their software audibly to turn on the lights or read out bank statements or other commands without having to do it themselves, saving them a lot of trouble (Matthews, 2019). This amazing technology is flexible, useful and its making people’s lives easier as well.

Since the time Siri was introduced to the public, Voice assistant technology has become a big part of US households and has become an important part of many people’s daily lives. According to a 2018 survey, 72 percent of 1,000 participants indicated that they have used a virtual assistant. Furthermore, 44 percent of these survey respondents have used VAs to control another smart device at home.<sup>8</sup> A 2019 survey estimated that more than 110 million people in the

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US use VAs at least monthly, a 9.5 percent jump from 2018. Smart speakers are now a common household item, with more than 133 million in use in the US and about 26 percent of US consumers owning smart speakers (Shih, 2020). The expansion of voice assistants is quite rapid and continues to become more and more popular.

### **Security Aspects**

In order to obey the commands of the user, Voice assistants are recording what is said to them and this data is sent to massive servers in order to formulate a response; this data is processed and stored in the Cloud (Bolton 2021). During this process, it is possible that there may be a breach in privacy when it comes to voice assistants listening and recording the users. Many people are holding off investing in voice assistants because of the fear of losing their privacy. All people are concerned with the lack of assurance or security that is provided to keep users' private and personal information intact. In 2018, the *Guardian* reported that an Alexa user from Portland, Oregon, asked Amazon to investigate when her device recorded a private conversation between her and her husband on the subject of hardwood floors and sent the audio to a contact in her address book without her command and knowledge. In 2019, the Daily Telegraph reported that Amazon employees were listening to Alexa users' audio—including that which was recorded accidentally—at a rate of up to 1000 recordings per day (Bolton, 2021).

Security and privacy are popular and valid concerns of users when it comes to voice assistants. Other people have the ability to impersonate a user and extract their information from the voice assistants. With data being recorded and sent to other servers and clouds, cyber attacks and data theft are highly possible. Amazon and Google have skill stores which allow the

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uploading of malicious applications deliberately designed to access a user's data means that the user is unable to rely on the fact that the skill they downloaded, and use is safe, which poses as a serious security threat (Bolton, 2021).

The act of recording information without the consent of the user can cause serious legal trouble for the voice assistants' industry. Amazon acquires consent from the consumer who is purchasing the assistant by making them agree to the terms and conditions at check out (Pfeifle, 2018). But what happens when this consumer may have guests, who never consented to being recorded by Alexa? This common situation can cause problems for both parties. Amazon has obtained the right to record the user who purchased the product, but an unsuspecting guest remains naïve to the fact that they may be recorded, which is a violation of the individual privacy law. There are various risks associated with the Echo's recording function. For example, the device can breach privacy by recording and transcribing personal and sensitive information. Not only can it retain the recordings, but it can also inadvertently send them out. Moreover, the information it gathers can be used by Amazon without consent-for example, to advertise or to sell to third parties (Pfeifle, 2018). If voice assistants like Amazon Alexa continue to overlook this problem and fail implement the right type of security, people will possess the right to sue them on the right accounts.

As voice assistants become more and more advanced, more security requirements should be instilled. There should be a way for a user to have solid authentication to access their data in order to erase the risk of information theft. Companies, like Alexa, should find a way to ensure that third parties are aware of a recording device being present among them and obtain their

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consent. There should be a screening process for all voice assistants in which if recordings are deemed to have private information, it should quickly be deleted. The more security there is to ensure the safety for the users, the better the situation will be for voice assistant companies.

### **Ethical and Social Implications**

With the number of questions directed toward voice assistants, they have most likely gained a sizeable amount of data from each user. What this software does with this data is where the ethics of voice assistants is questioned. On the global landscape of AI ethics guidelines, five emerging ethical principles are deemed important – Transparency, Justice and fairness, Non-maleficence, Responsibly and Privacy (Kaul, 2021). The makers of each brand of voice assistants should demonstrate transparency by being blatantly upfront about what commands can be made, where the consumer's information is going and how it is being used in order to create a more trustworthy relationship between users and the technology (Kaul, 2021). Humans have the right to be informed about the usage of their personal information, and, through transparency of technology and user interaction, people feel more comfortable using the product. By being fair to consumers, it means voice assistants provide the same information to every user, no matter what prior information has been collected beforehand.

Through the means of eliminating bias and informing the consumer about the whole picture, everyone is able for equal opportunity and experience (Kaul, 2021). Responsibility and accountability means acting with integrity, clarifying the attribution of responsibility and data

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ownership. In case of virtual assistants, this refers to being transparent, fair, disclosing information on responsibility, legal liability and data ownership to consumers (Kaul, 2021). Consumers should clearly be told what their responsibilities are and how their data is being used. Users should be informed of what they're getting into when taking home a voice assistant. It's their life that is being affected if they aren't told all the information they need. Ethics is the key to understanding what a person or brand stands for. Voice assistants are there to help and cater to humans, therefore, their position on the topic of moral obligation matters.

Digital assistants have always been a technology that humans were fascinated with. Humans have expressed their eagerness to talk to computers since the first commercial computer was introduced (Hoy, 2018). Drawing on research, it is apparent that there is a growing level of social presence from machines (McLean and Frimpong, 2018). Voice assistants give users the illusion of actual human helpers. As time goes on, humans are considering these machines as real company. Research shows that as computers use natural language, interact with users in real-time and in some cases fulfil traditional human operated social roles (e.g. customer service in a Bank), even advanced computer users often treat machines as social entities (Lombard & Ditton, 2000). Moon (2000) posits that humans are socially oriented beings, and thus apply social roles when interacting with technology such as politeness, pausing for response and curtsy during interactions in the same way as they would with another human (McLean and Frimpong, 2018). Voice assistants have been advanced so much to the point where humans actually treat these machines as other humans. Voice assistants socially benefit humans because their human characteristics allow users to be more comfortable with them and because of the comfort, humans trust these machines more to provide them with adequate information.

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### **Future Use**

Voice assistants have become an integral part of many people's lives, it has advanced their homes whilst freeing people of some burdens. Voice assistants contain many unique and helpful features, yet they have a lot of room to improve. Almost ten percent of people who do not own a smart speaker plan to purchase one. If this holds true, the user base of smart speaker users will grow 50 percent, meaning a quarter of adults in the United States will own a smart speaker (Ramos, 2018). More and more humans are witnessing the benefits of voice assistants and how much easier they have made life for current users. This steady rate of popularity will influence voice assistants to become more advanced every day. There are many features and ideas that creators are already considering for the future of voice assistants. Smart speaker sales are expanding in other parts of the world, meaning voice assistants will be able to come in all kinds of dialects and languages. The experts predict that voice assistants will improve in many other ways. A concept called Computational Creativity builds algorithms that can do arts and crafts hobbies like write music, paint portraits, and tell jokes. These capabilities will help smart speakers "show emotion" and "think" for themselves without being scripted (Ramos, 2018). There are many high hopes for what the future brings for the development of voice assistants.

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**References**

Shih, W. (2020). Chapter 1. voice revolution. *Library Technology Reports*, 56(4), 5-13.

Retrieved from <http://mutex.gmu.edu/login?url=https://www.proquest.com/scholarly-journals/chapter-1-voice-revolution/docview/2441557136/se-2?accountid=14541>

**Annotation:** This paper discusses the much-needed background information about voice assistants: the comparison between the different kinds, the development, and how they have become part of our daily lives. This is a scholarly journal from ProQuest, a database that is trustworthy to extract information from. This source provides a detailed history of voice assistants, targeting an audience who has no clue about this topic and provides them with everything they need. This source is also very current, so all the information is up to date and nothing important is being left out. This reference will be quite helpful when writing my paper because it gives me the history of voice assistants, facts and knowledge I need to aid the claims in my writing. This source is relevant to my research because it provides me with important information about my topic and allows me to learn about the usage of voice assistants.

Kaul, A. (2021, January 22). *Virtual Assistants and Ethical Implications*. IntechOpen. Retrieved September 23, 2021 from <https://www.intechopen.com/online-first/74746>

**Annotation:** This article discusses the importance of ethics as a whole and its application to voice assistants. It gives a detailed description of the different parts that make up ethics and how voice assistants can be applied to this breakdown. This is a chapter from a book I obtained from Google Scholar, which is a reliable search engine that provides me with relevant, scholarly

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sources. This book is very current, making it reliable because the author was able to obtain the information needed to make certain claims and inform others. This chapter is very descriptive and provides the history of voice assistants as well as the ethics, making it perfect for any audience that is interested in learning about this topic. This source is reliable because it is current, written by a credible author, and provides the nitty gritty details.

Pfeifle, A. (2018). ALEXA, WHAT SHOULD WE DO ABOUT PRIVACY? PROTECTING PRIVACY FOR USERS OF VOICE-ACTIVATED DEVICES. *Washington Law Review*, 93(1), 421-458. Retrieved September 23, 2021 from <http://mutex.gmu.edu/login?url=https://www-proquest-com.mutex.gmu.edu/scholarly-journals/alex-a-what-should-we-do-about-privacy-protecting/docview/2033273011/se-2?accountid=14541>

**Annotation:** The purpose of this paper is to discuss the privacy problems that are associated with the trend of voice assistants. The paper addresses the issue of voice assistants recording personal audio and how it may run into problems. This is a scholarly journal from ProQuest, a database that is very trustworthy, therefore, reliable in aiding my research. This source is very current, so it contains up to date information about my topic and it is very informative about my topic as a whole. This source is relevant because it highlights the downsides of voice assistants and the possible legal trouble it can lead to, which is an important part of my research.

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Bolton, T., Dargahi, T., Belguith, S., Al-Rakhami, M. S., & Sodhro, A. H. (2021). On the Security and Privacy Challenges of Virtual Assistants. *Sensors*, 21(7), 2312. Retrieved September 23, 2021 from <https://doi.org/10.3390/s21072312>

**Annotation:** This source discusses the security and privacy challenges that are proposed by voice assistants. It also provides real-life instances and gives ideas on how to solve these challenges. This is an article I obtained from Google Scholar, which is a reliable search engine that provides me with relevant, scholarly sources. This article is very current, making it reliable because the author was able to obtain the information needed to make certain claims and inform others. This article is very descriptive and provides a brief history of voice assistants as well as true stories in which people suffered from voice assistants, making it perfect for any audience that is interested in learning about this topic and providing readers with true evidence. This source is reliable because it is current, written by credible authors, and provides stories that help animate the problem at hand.

Team, A. (2020, January 30). *What is a voice assistant?* Alan Blog. Retrieved September 23, 2021 from <https://alan.app/blog/voiceassistant-2/>

**Annotation:** This source discusses the function of voice assistants and the different types of them. This source also provides a timeline that describes how different voice assistants came to be. This is a blog that discusses the current use of voice assistants, making it reliable because it's written out of facts. The target audience can be people who are clueless about voice assistants in general and provide them with a general understanding.

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This blog is reliable because it is very current, the author is fairly credible, and the article is informative enough to introduce voice assistants.

McLean, G., & Frimpong, K. O. (2019, October 1). *Hey Alexa ! examine the variables influencing the use of artificial intelligent in-home voice assistants*. ScienceDirect.

Retrieved September 23, 2021 from

[https://www.sciencedirect.com/science/article/pii/S0747563219301840?casa\\_token=VPDJCJ4NbIYAAAAA:uHOCWID\\_fSbZeCqLs-AVUStx84IVOotdIBZ1LzQ43xuXoA49XIC9KxSKSQ6zf8R-hDPXykch\\_w](https://www.sciencedirect.com/science/article/pii/S0747563219301840?casa_token=VPDJCJ4NbIYAAAAA:uHOCWID_fSbZeCqLs-AVUStx84IVOotdIBZ1LzQ43xuXoA49XIC9KxSKSQ6zf8R-hDPXykch_w)

**Annotation:** This source discusses the influence technology has on humans and the way we live life. This source also touches on the reasons why artificial intelligence is affecting us and how it's changing our normal lives. This is an article I obtained from Google Scholar, which is a reliable search engine that provides me with relevant, scholarly sources. This article is fairly current, making is reliable because the author was able to obtain the information needed to make certain claims and inform others of the findings. This article is very descriptive and provides statistical evidence, making is perfect for any audience that is interested in learning about this shift in life. This source is reliable because it is current, written by credible authors, and provides evidence that help support the claims.

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Mathews, J. (2019, 05). Will alexa help blind clients with their accounts?: Voice assistants offer convenience, but pose their own concerns. *Financial Planning*, 49, 48. Retrieved September 23, 2021 from <http://mutex.gmu.edu/login?url=https://www.proquest.com/magazines/will-alexa-help-blind-clients-with-their-accounts/docview/2217540465/se-2?accountid=14541>

**Annotation:** This is a source that tells short, true instances about visually impaired individuals and how voice assistants have made their lives easier. It also talks about some advancements that can be made to further cater to the disabled. This is a magazine from ProQuest, a database that is very trustworthy, therefore, reliable in aiding my research. It provides real-life application of voice assistants and how it is taking the burden of certain tasks away from people. This source is reliable because it is current enough to be up to date, it contains evidence of the current use of voice assistants, and it comes from a well-know database.

## THE TECHNOLOGICAL SERVANTS OF THE FUTURE: VOICE ASSISTANTS

Ramos, D. (2018, April 16). *Voice Assistants: How Artificial Intelligence Assistants Are Changing Our Lives Every Day*. Smartsheet. Retrieved September 23, 2021

<https://www.smartsheet.com/voice-assistants-artificial-intelligence>

**Annotation:** This source discusses the voice assistants as a whole and its effect on our society.

This source also contains future uses of voice assistants. This is an article I obtained from Google Scholar, which is a reliable search engine that provides me with relevant, scholarly sources. This article is fairly current, making it reliable because the author was able to obtain the information needed to make certain claims and inform others of the findings. This article is very descriptive and provides statistical evidence, making it perfect for any audience that is interested in learning about how voice assistants are slowly changing our lives. This source is reliable because it is current, written by a credible author, and provides evidence that help support the information.