

# **Intelligent Searching: Voice Searches, Machine Learning, and Artificial Intelligence.**

# Abstract:

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This research paper will discuss how voice searches, machine learning, and artificial intelligence incorporates text analysis, knowledge management, as well as automations in the processes of intelligent search. Advantages of the intelligent search systems will be discussed, but the discussion of the social, legal, and ethical issues will also arise. This paper will research the change in user interaction after being presented with the social, legal, and ethical issues of intelligent search systems that users may not be familiar with.

# Introduction

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Intelligent searching is a trending topic within the technical world. It is a new way to give direct answers. Some examples of intelligent search systems are voice searches, like Apple's Siri or Amazon's Alexa, artificial intelligence, and machine learning. Although people love their Siri and Alexa, there is a lot of information that is not displayed with these intelligent search systems. There are many negative aspects that people are unaware of when it comes down to these systems. This paper will analyze any social, legal, and ethical issues as well as discuss the type of effect it will have on user interactions if users were notified of these issues.



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# Literature Review for Voice Search

Voice search is a voice command that the user says to search the internet, a website, or even a mobile app. In other words, voice search has a voice keyword query on any information on the world wide web. An example would be Alexa and Siri (Intelligent Search). How does it work? It is simple! It works by reading the result that is pulled from the user's voice and adds it to the text box, when finished the assistant instantly drops what is asked into the world wide web for an outcome. Also, voice search works well with knowledge management. Knowledge management is defined as a process of using and managing information of an organization.



# Literature Review for Voice Search Cont.

An advantage of voice search regarding knowledge management would be how it is able to take the users words and search the world wide web for the outcome. This is more efficient and easier to use for the user. Since nothing is perfect in life, it is time to get into some disadvantages of voice search, one of which being that the device is “always on.” Many users are not aware that for a device, such as Apple’s Siri and Google’s Alexa, to recognize the user's voice they must always be up and running. Yes, this means that the devices are always recording/listening and waiting to hear you call its name.

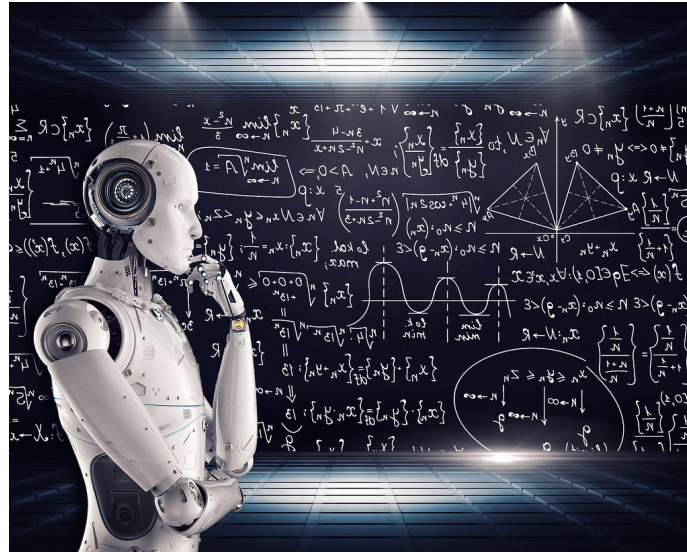
In the article “Social and Ethical Concerns of Smart Voice-Enabled Wireless Speakers” by [Jozef Jarosciak](#), he goes on to explain the negative impacts of Intelligence personal assistants. He explains how IPA’s like Siri and Alexa are “always listening” and record everything to pick up the voice call of their names. Data ownership is other preexisting issues he addresses as well.

An excellent example of a data ownership concern would be with an ongoing court case in Arkansas. Authorities are demanding the release of all recordings from Amazon Echo device, to investigate a murder case. A search warrant states police can seize anything that they believe could have extracted evidence from the scene. There will be more discussion on where the information is stored and how it is being used.



# Literature Review for Machine Learning

Machine learning is a type of artificial intelligence used to provide systems the ability to automatically learn and improve from experience without needing programming. One of the advantages to machine learning is that they focus on the development of computer programs that get access to data that use it to learn for themselves.



# Literature Review for Machine Learning Cont.

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Text analytics is another benefit with machine learning. “Extracting meaning: The Convergence of Machine Learning and Textual Analysis.” is an excellent source to depict the relations between textual analysis and a form of an intelligent search system, machine learning.

Textual analysis is the automated process of using artificial intelligence to detect important information. The article explains how machine learning works hand in hand with textual analysis. Machine learning deciphers the physical texts for the textual analysis to occur.

Text analytics is a process of automating large volumes of some sort of text into data for the machine to interpret (The Practical Guide to Textual Analysis). For example, with machine learning, universally one would be able to go to a foreign country without knowing the language and use the machine to interact with others. Essentially machine learning would be able to erase language barriers.



# Literature Review for Artificial Intelligence

Artificial intelligence is defined as a type of science through computing that emphasizes intelligence of machines, to think and work like humans. Some advantages would be speech recognition and problem solving. Automation is a process where it takes over human labor activities and changes them to where it can be done by technology. When automation and AI come together, they create something called an intelligent process automation, also known as an IPA. IPA are powerful tools because you are merging the benefits of automations and artificial intelligence (Kufinski,2019).



# Literature Review for Artificial Intelligence Cont.

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The article “Automation and AI are coming for IT jobs. Here is how to keep yours.” by Sid Suri is an article that gave a lot of insight to some negative aspects of both intelligent search systems and automation. This article exemplified a connection between automation and artificial intelligence. It also expressed the similarities between both topics through the negative impacts they have socially.

This article provided us with predicted statistics of job loss caused by automations and AI. The article states “artificial intelligence (AI), machine learning, and automation will replace 7% (or 22.7 million) jobs in the US alone” (Suri) by the year 2025. This article begins to discuss some of the future effects that automation and AI (an intelligent search system) will have on current and future jobs. The article proceeds to discuss a few tips and tricks to maintain a job and try not to lose it due to automations and a form of intelligent search systems.



# Research Question:

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Will user interaction change significantly if users are aware of the social, ethical, and legal issues intelligent searching systems have?

# Null Hypothesis:

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Users interaction will have a significantly decrease if users are aware of the social, ethical, and legal issues intelligent searching systems have.

# Method

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## Participants:

- Participants (n=60) were randomly selected. Since the research was broken up to three different parts, there were 20 participants in each part (which makes up the 60 total participants).

## Apparatus:

- The research was split into three different research parts to help understand a general decision from possible consumers. The different parts were broken up by specific technology. There were three different parts. The first part was about voice search systems. The second part was about machine learning. Finally, the last part was on artificial intelligence. All parts touched on the social, legal, and ethical issues they may consist of.

# Procedure

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For the procedure, we will have sixty participants and be breaking those sixty into random groups of three (twenty participants per group). Group A will be dealing with voice search. Group B will deal with machine learning, and Group C artificial intelligence. Half the participants will already be informed of the social, ethical and legal issues related to their group's topic. Each group will be asked a series of questions that is also related to their group topic.

# Questions:

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- For group A, the participants will be asked the following:

*Would you buy a voice search machine (Google home, Alexa) for your home? Is Siri enabled on your phone? Are voice searches always listening?*

- For group B, the participants will be asked the following:

*Do you use Facebook? Do you know how/ where data is stored on Facebook?*

- For group C, the participants will be asked the following:

*Would you buy a self-driving (electric) car? Do you know how they drive themselves? Do you trust self-driving cars?*

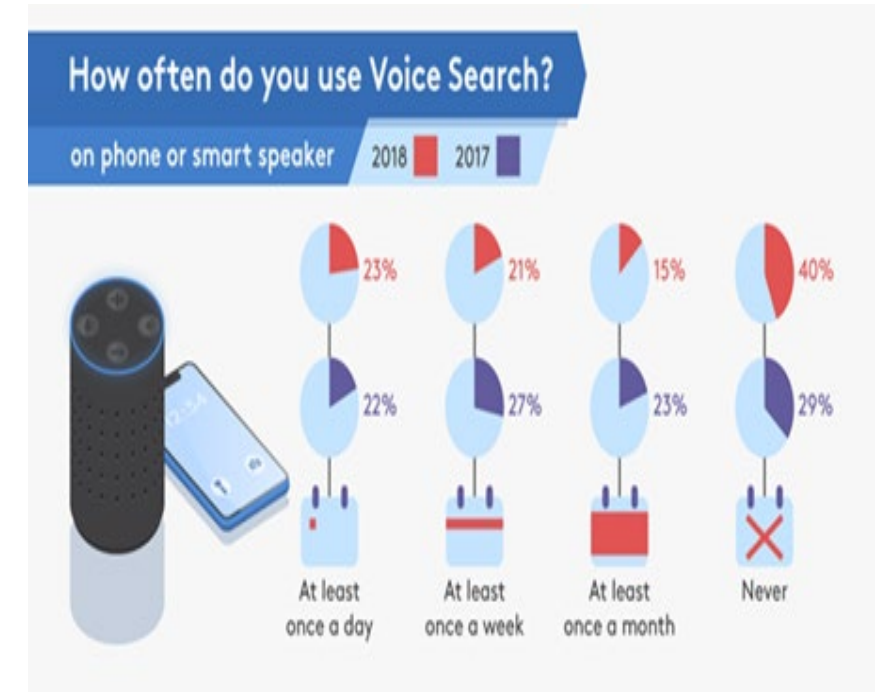
# Results of Voice Searches

- Data from voicebot.ai show that voice search device purchases in the United States has risen by 40% in 2018.
- This information shows that people are either willing or do not know about data gathering that is involved with voice search devices.
- We can also gather that young people use voice searches more often than old people as visualized in the image to the right.
- Current trends show that every concurrent generation has been more accepting of voice search technologies than in the previous generation.



# Results of Voice Searches

- Some conflicting evidence shows a decline in overall voice search use.
- The infographic to the right shows a decline from 2017 to 2018 with given statistics from econsultancy.com.
- People who never use voice searching in 2017 was at 29% and changed into 2018 to 40% of people reported that they never use voice searching.



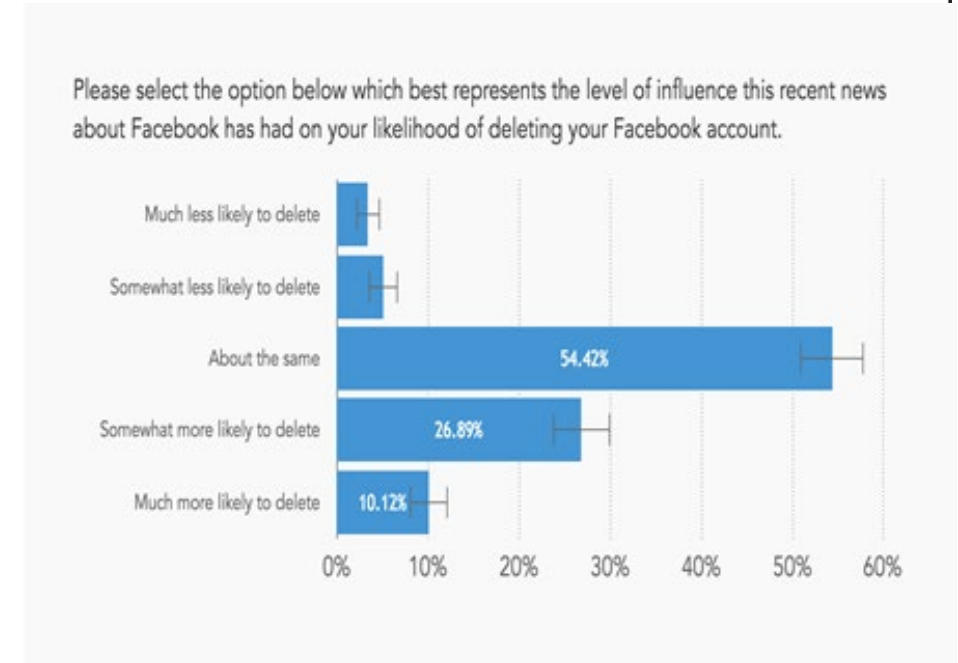
# Results of Voice Searches

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- Legal repercussions of voice search technologies can be seen in Congress where every year Apple, Google, and Amazon all must go talk with congress to defend their legality on a myriad of systems, with voice recording data being one of the major ones
- Ethical implication of taking data with the voice systems are apparent as taking peoples' data without clear consent is ethically wrong.
- As well as it puts people into categories and is causing divides in people by making essentially tribes that war over their ideals.

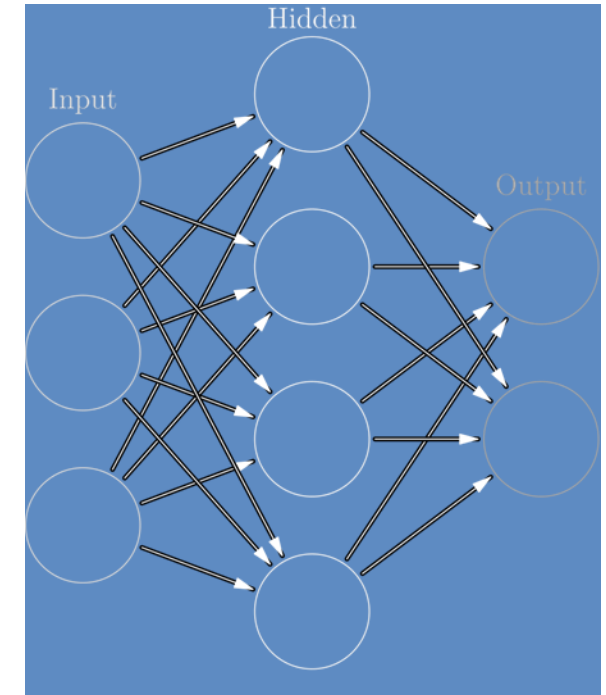
# Results of Machine Learning

- The Cambridge Analytica scandal with Facebook had major implications on how machine learning is used to organize the data of searches of Facebook.
- From the results to the right, public trust in social media has fallen after learning how machine learning interfaces with their social lives.



# Results of Machine Learning

- Major legal problems of machine learning are that machine learning algorithms generally are “black boxes” where it’s impossible to see how they really work and function
- And it may be impossible to know why a machine learning algorithm has decided.
- How can you put legal action against machine learning where the code that is made is Generated by other code through inputs and parameters.
- What part can congress write laws on when everything is hidden.
- All these implications come from machine learning and there needs to be a system in place that prevents these machine learning negatives were people gather in groups and damage societal acceptances thanks to rampant unchecked machine learning.



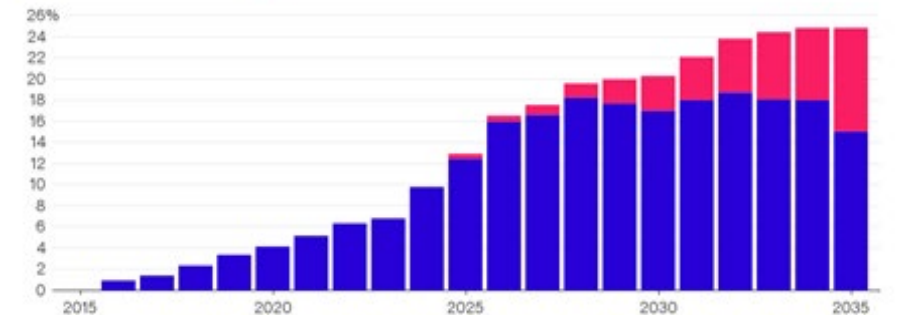
# Results of Artificial Intelligence

- Artificial Intelligence such as self-driving car technology will affect the workforce both positively and negatively impacts on social life.
- The positives of Artificial Intelligence would be that jobs that are hard on people and undesirable such a truck driving, taxi driving and even extending into fast food will all be either enhances or replaced by Artificial Intelligence.
- The negatives of Artificial Intelligence are that it will take away lots of low skill entry level job potentially making it harder to find a job if there is not enough demand for the given labor.

## Autonomous Car Sales Will Surge By 2035

The cars will represent 25 percent of the global market

■ Partially autonomous cars ■ Fully autonomous cars



Source: The Boston Consulting Group  
Note: 2015 data

Bloomberg

# Results of Artificial Intelligence

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- There is also the question of if Artificial Intelligence laws should either apply as some new Artificial Intelligence laws will need to fall under human laws if that scenario comes to pass.
- Should there be laws in place to protect workers from job replacement from Artificial Intelligence or to move them on to alternative jobs?
- We can see that Artificial Intelligence brings with it more questions than answers.
- It can be said that no matter what side of the isle the debates on how to handle the ethical dilemmas of Artificial Intelligence the answers surly fall somewhere in the middle.

# Summary

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- Finally, Intelligent searching is a gravitating topic within the technical world, it is a new way to give direct answers to a multitude of scenarios. Voice search is a voice command that the user says to search the internet, a website, or even a mobile app. Once again, a few examples of voice search would be Apple's Siri, Amazon Alexa and Google home. voice they must always be up and running. Yes, this means that the devices are always recording/listening and waiting to hear you call its name, this is just one of many ethical issues that come along with voice search. Next is machine learning,
- **Machine learning** is a type of artificial intelligence used to provide systems the ability to automatically learn and improve from experience without needing programming. One of the many advantages to machine learning, is that it focuses on the development of computer programs that get access to data that use it to learn for themselves. Pricing would be the biggest downfall to machine learning! Lastly, Artificial Intelligence was the last thing discussed,
- **AI** is defined as a type of science through computing that emphasizes intelligence of machines, to think and work like humans. Some advantages would be speech recognition and problem solving. Unemployment is the biggest ethical problem surrounding AI, due to the advancement of robotics it will take care of everyday jobs that do not require a degree of some sorts. These three things will be lead and destroy the world all at the same time. How do you think this will impact your everyday life?



# Resources

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