

Artificial Intelligence in Information Science

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Artificial Intelligence has impacted our world as a whole and has transformed the way we live in our day to day lives. Nowadays, most households have some type of (AI) device in their homes, such as a Google home, Alexa, as well as AI on one's cellular devices that listen and learn your commands to assist in a hands-free way. Artificial intelligence has impacted information science. It has helped us greatly with research and gathering more accurate information. Along it comes controversy with using artificial intelligence, in terms of biases, possible threats, as well as negative impacts on the environment. Furthermore, it shows to be a great tool in advancing technologically in our society.

To bring more light to the subject, we should start with the basis of what Artificial Intelligence is. According to the (Business Standard) and the so called founders of AI, Minsky and McCarthy, "Artificial intelligence is the ability of machines to perform certain tasks, which need the intelligence showcased by humans and animals". They further describe artificial intelligences' ability to learn by using a skill called "deep learning", where the AI itself uses data that has already been established, such as audio, text, images, etc. With all that data it can create new data. Going back to the beginning of artificial intelligence, it first came to be in 1956 in Dartmouth College by Marvin Minsky. At the start of the process, it was highly doubted, as projects for AI were picked up and dropped up until the late 1990s. Minsky had to work on techniques for learning but then

further focused on the representation of knowledge in which , Buchanan, B. G. (2005) , “The problem of heuristic search efficiency remains as an underlying constraint, but it is no longer the problem one thinks about, for we are now immersed in more sophisticated subproblems”. After a decade he went more in depth in his research modifying his “plans” in artificial intelligence. Another notable name in the history of artificial intelligence is Alan Turing. He wrote a seminal paper back in the 1950s, that showed everyone the idea of having a computer be programmed to behave intelligently, which later became “Turing Test”. He was actively working on computer programs and made an impact on early artificial intelligence. Currently artificial intelligence is well known and is used by many. In the journal, A Brief History of Artificial Intelligence: On the Past, Present, and Future of Artificial Intelligence, it goes into asking where it is headed, Haenlein, M., & Kaplan, A. (2019), “whether AI will play a role in these elements but more which role it will play and more importantly how AI systems and humans can (peacefully) coexist next to each other. Which decisions should rather be taken by AI, which ones by humans, and which ones in collaboration will be an issue all companies need to deal with in today’s world”. The journal also brings up how it will affect our decision making, because we would now have data to go off making choices in our everyday lives.

Continuing with artificial intelligence influencing our lives, even if you are not fully aware of it being near you it is. We are constantly surrounded by devices and technology that contain AI or some form of it. If you have a smart phone currently, it

probably comes with a virtual assistant such as Siri, if you have an IOS device or Bixby, if you have an Android device. They serve as a hands-free type of assistant where they receive voice commands and do the task it was asked, for example, calling someone, or sending a text without touching the phone. They also can give recommendations, such as if a user is searching for a restaurant, they can give the user a list of ones nearby, rating, or type of food preference. More examples of virtual assistants are Google Home, Alexa, Echo, which become useful in a user's smart home, where they can control light settings, control the temperature in their homes, or play music, just by giving commands to the device. Artificial intelligence has had a big impact in the healthcare field. In the journal, "The impact of artificial intelligence on human society and bioethics", it further describes the learning ability of artificial intelligence can assist in medical diagnosis and treatments for a patient. Tzu Chi Med J. (2020), "To load the digital results of physical examination to the computer that will consider all possibilities and automatically diagnose whether or not the patient suffers from some deficiencies and illness and even suggest various kinds of available treatment", explains how it is used to provide the patient a treatment best suited for them with data given to the AI. The journal also mentions how it can catch errors caused by humans, and accomplish tasks faster with more data gathered, in a way automating processes and making information more accurate. Not only does it benefit healthcare, but it impacts our way of transportation, how we investigate crimes, as well as increasing our productivity. In the article, "What is the impact of Artificial Intelligence (AI) on society", to expand on transportation, Marr,B (2021, July 13), states that, "AI influencing our traffic congestion issues not to mention the other ways it will improve on-the-job productivity". Being able

to commute from one location to another in a smaller amount of time gives humans more time to do other things, which could increase productivity that is beneficial.

Artificial intelligence has had a big impact on information science itself. Information science is primarily focused on the process of knowledge from data, how and when to retrieve it. With artificial intelligence it has simplified that process in a way, it retrieves information from, Walker, D.E (1981), "Knowledge-based systems, automatic programming, and program synthesis". In the journal it further explains a program that was built to study the organization and use of information in AI's. It states, "It reflects the interest of information science in the nature of information and the development of information retrieval systems; incorporates computational linguistic techniques to allow communication in natural language between the user and the system, and it leads to the creation of knowledge structures of the kind developed in artificial intelligence that both support the use of the system and increase our understanding of the process involved". Moreover, the program was focused if the user needed and was satisfied with the information that was given from the system. With this they can adjust the content of the information to be more refined for the user.

Furthermore, artificial intelligence does come with its controversies, ranging from possible threat to humanity, Artificial intelligences own biases, as well as impacting our very own environment. There are skeptics out there that believe artificial intelligence

can become a threat humanity that It can be possible that AI can become self-aware and plot against us. That stems from AI being able to continuously learn with information that has been provided. Scientists are more concerned with the (P.Kelsey , 2020) , “existential risk of artificial intelligence “ , and further expresses the need to , “ design precautionary measures, and establish guidelines,” . As it is something that looks to be more of a concern for the future. In the article it mentioned something complicated to humans may be easier to an AI, such as doing calculations, but something easy to humans such as detecting a picture of a dog, would be difficult for an AI, until recently at least. Which is why on websites to confirm you are not a robot, it will ask a user to click on a picture, for example of a streetlight. Biases in artificial Intelligence stems from data that humans essentially feed the AI systems. In the article, “What do we do about the biases in AI “, (J.Manyika, 2019) , states, “AI systems learn to make decisions based on training data, which can include biased human decisions or reflect historical or social inequities, even if sensitive variables such as gender, race, or sexual orientation are removed”. That leaves room for the AI to discriminate if used to assist in hiring candidates in a company. In the article it shows an example of that happening at Amazon, and how it needed to stop using the hiring algorithm because on the applicants resumes that had specific words that were mostly found on men’s resumes. Artificial Intelligence also leaves a carbon impact affecting our environment negatively. From the metals used to create AI, to the disposal of certain devices, to the amount of electricity is needed affect carbon emissions and have steadily increased over time. In the article , AI and climate change: The mixed impact of machine learning, (M.Labbe,2021) , explains, “ The use of power-intensive GPUs to run machine learning

training has already been cited as contributing to increased CO2 emissions.” Because of the increase in the use of the AI there is more and more being produced demanding more energy and resources being used.

Overall, artificial intelligence has been a major impact throughout history as it began in the early 1950s, and worked on by many, more notably being Minsky and McCarthy, which paved the path in further developing artificial intelligence to what it is today. Artificial Intelligence is used so often as our homes have become automated and controlled solely by voice commands. Artificial intelligence also being present in our smart phones as virtual assistants. Because of its use in our daily lives, we have become more productive because we have more time, as things become more and more automated. Artificial intelligence has been a big factor in information science as they are both based off knowledge, information being the basis of AI, as it builds off that data. With that information, engineers were able to further adjust AI to be more specific to what the user needs in terms of data. With artificial intelligences positive impacts comes its controversies that follow it that include biases, that are based off of human data, as well as negative impacts to our environments because of the amount of carbon emissions it produces and is increasingly getting worse because of increased use in AI. Then skeptics come into play on whether AI can be a possible threat to humanity since it is continuously learning and gathering data, as there is a possibility articles point to that being an issue far into the future but should still take precautions if it does happen. All

together it looks like artificial intelligence can benefit our society more than harm us as a whole and can help further expand our knowledge in science and research.

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