



## Artificial Intelligence and Jobs of the Future: Adaptability Is Key for Human Evolution

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Humans, the most intelligent species on planet Earth, have always found a way to adapt to their dynamic environment and survive in a consistent manner. We have made tremendous progress in evolving from primitive men and women in small, dreary caves to modern men and women in large, bustling cities. Our passionate strive to survive and affinity to adapt is similar to that shown by mosquitoes; regardless of the continuous development and massive deployment of insect repellent products, these undeniably irking insects, which cause a plethora of life-threatening diseases, always make a striking comeback (Stanczyk, Brookfield, Field, & Logan, 2013).

Humans have a natural tendency to be preoccupied with what interests us the most. We lack the ability to not think of anything, even for a second. Boredom is not an option for humans; this is evidenced by a research experiment conducted in 2014 by Timothy Wilson, a social psychologist professor at the University of Virginia, Charlottesville (Wilson et al., 2014). The results of this research found that humans would go to the extent of shocking themselves with small jolts of electricity, when locked alone in a lab, just to keep themselves occupied. Our minds were built to be aware of the world around us and engage in actions and decisions that shape it. Thus, it is not possible to stop continuously flowing thought processes (Whitehead, 2014).

Our rich and vivid history may be described as a continuously flowing river, which does not heed to a specific, predictable pattern. However, the river does take similar looking turns as it flows. Applying this hypothetical case to real world history, we see that major events, be it global revolutions, wars, famines, natural disasters, and even plagues, do recur, though, and at irregular intervals.

The time interval between two successive

events is influenced by two factors — our mindset and our reaction towards change. For example, consider an article published by Columbia University on the psychology of gullible mindsets (Valhouli, n.d.). According to this publication, a fourteen-year-old boy convinced forty-three of fifty people to support a ban on water. The boy referred to water as dihydrogen monoxide, the chemical name of water, in a petition that was circulated through the internet. An important factor to consider is the way this petition was framed to influence human minds; he claimed that dihydrogen monoxide was a harmful chemical that was found in tumors of cancer patients. Similar convincing sentences use widely known terms such as sweating, vomiting, erosion, and lethal to lure an uninformed reader. The reader takes the authenticity of the provided information for granted without checking facts or running background checks on its source. The information is then dispersed through casual conversations and discussions to a wider network, leading to the general public being falsely informed. Therefore, it is evident that our mindsets are one of the most gullible and volatile entities on our planet; widespread controversies, futuristic sci-fi movies, factually inaccurate data, and popularized opinions of highly influential representatives do a very good job at molding it.

Change-events are stimuli for human societies. When the change is for the better and provides visible benefits, the reaction is most likely positive. For example, the establishment of independence or democracy in a country, the creation of new job opportunities, etc. In a similar way, when the change is disruptive and removes certain key defining aspects of human life, the reaction is most likely negative. For example, the increase in income taxes and fuel prices or the decrease in job satisfaction leading to lack of peaceful life (Rohani & Pahazi, 2018).

Industrial revolutions, dubbed as the perma-

ment markers of change, have had monumental impacts, both positive and negative, on the lives of humans. An industrial revolution can be thought of as a steering wheel of a car that represents the human civilization; this car has made three sharp turns and is on a straight road, looking forward to making a fourth turn.

The first turn, which had the largest radius, witnessed the urbanization and industrialization of several rural societies as well as the deployment of steam engines, which played a major role in the development of transportation technologies during the 18th and 19th centuries. The second turn saw the growth of industrial centers around the world — right before the first world war — and the introduction of mass-produced electrical appliances, which included technological advancements that would change the world forever. The third turn, which started during the early 1980s, took the car onto the digital highway; the digital revolution and the boom of the internet made it possible for almost everyone in the world to stay connected. The fourth turn, the most anticipated of them all, deals with significant advancements in the fields of 3D printing (Kyle, 2018), bio-circuits (Prox, Smith, Holl, Chehade, & Guo, 2018), quantum computing (Chong, 2018), robotics, IoT (Agiwal, Saxena, & Roy, 2018), nanotechnology (Alvarez, Chan, Elimelech, Halas, & Villagrán, 2018), renewable energy technologies, self-driving vehicle technologies (Bansal & Kockelman, 2018), and finally, the most controversial and popular of them all — Artificial Intelligence (AI) (Lu, Li, Chen, Kim, & Serikawa, 2018).

Ever since its inception in 1956, when John McCarthy held a conference on the subject (McCarthy, Minsky, Rochester, & Shannon, 1955), Artificial Intelligence has always caught the imagination of those who take it upon themselves to “predict” the outline of future societies (Barrat, 2015). It is undoubtedly an inspiring and captivating field; however, it is met with a great deal of controversies and misconceptions regarding its purpose and intention. Some research suggests controversial ways in which it would influence human life while others see the potential for a future where AI systems complement human societies. An oversimplified and partially misunderstood influence of AI is its effective take over of human-centralized jobs in the future.

The reason behind these misconceptions and controversies is due to a misunderstanding of one word — Technology. Technology is a life-altering word that has found its place in human society. Over the past few decades, it has been integrating itself into all aspects of human life, and now, it is integral to our daily lifestyles. Our connection with technology has grown so deep that we cannot even fathom an alternate timeline in which humans live without it. Although widely debated, its intended purpose is to make human life simple and easy. It helps us achieve milestones and immensely speeds up the progress of our society as a whole.

We have witnessed the rapid transformation of our landscapes and interests as technology molds the shape of our future. It functions as a tool of change that teaches us how to adapt and evolve to meet the requirements of future societies. Today, some of us question these requirements and are doubtful of what this future might hold. It is easier and faster for humans to find flaws in an idea or a concept than it is to understand its true value.

Humans have shown varied reactions to the use of automation technology and robotics in several industrial areas (Knight, 2018). Consider the widely discussed transition of the manufacturing industry from recruiting skilled human workers to employing automated robotic technologies. The first flaw humans see with this transition is the massive unemployment of skilled laborers. What we fail to see is that this transition not only prevents us from working in hazardous conditions but also reduces a company’s expenditure in manufacturing processes. In addition, the end product is of a much higher quality due to reduction in human errors, and the time taken by the different processes is significantly reduced, thereby increasing production rates to meet the demand. Yet, despite all these advantages, we still consider the loss of jobs as a prominent result.

Humans have always developed a notion of resistance and anxiety over advanced devices and technologies, be it self-driving cars or artificial intelligence. Even in the 1980s, the term “computerphobia” was widely circulated in magazines, newspapers, and psychology studies (Lafrance, 2015). The term was

mainly used to address a person's fear of being threatened and replaced by a computer. In addition, people felt hostile in the presence of a computer. Eventually the presence of computers in our daily lives grew exponentially. This is quite synonymous to what is going on in the present day with artificial intelligence technologies. The general trend marks a peak period of hype and gradually settles into the books of history.

The Gartner hype cycle (*Hype Cycle Research Methodology*, n.d.) for emerging technologies in 2018 depicts the presence of artificial intelligence on two of the five regions in the hype cycle graph — innovation trigger and peak of inflated expectations. In addition, the graph also predicts that these various technologies under AI may reach the plateau of productivity — a period of mainstream adaptation — in roughly ten or more years (Panetta, 2018).

Ever since its creation, a computer was tasked with replicating and efficiently performing human tasks. It is just human notion that when a computer is able to do something new, we regain those feelings of anxiety and resistance. People, who are not properly informed of a specific technology, are easily persuaded by the depictions of AI as a threat. So, what is Artificial Intelligence?

Today's AI is a system of complex algorithms that do an exceptional job at processing and analyzing large volumes of data; it is a skill that humans lack due to the volatility and computational limitations of their memory systems. AI systems are purpose built for executing specific tasks, so there are several severe limitations on what it can accomplish; to put it in simple terms, AI is not yet anywhere near the ability to freely think as we do.

Super intelligence or "true AI", on the other hand, is a form that current AI technologies could possibly take in the future as we gain a deeper knowledge regarding its fundamental concept — the working of the human brain (Hassabis, Kumaran, Summerfield, & Botvinick, 2017). This future is not coming anytime soon; currently, there is no one on our planet who actually understands how super intelligence works (Byttner, 2017). Its progress is most entirely dependent on human brain research, which is currently progress-

ing at a snail's pace. Marlene Behrmann, a cognitive neuroscience professor at Carnegie Mellon University, claimed that neuroscientists only have a primitive understanding of human brain functions despite decades of research (Gornall, 2014). Thus, when humans themselves have not yet understood the complete working of their brains, it is improbable to create an intelligent system that can replicate it.

AI systems are excellent at performing repetitive tasks, which is evidenced by their purpose-built nature. It can automate almost any system that is repetitive or predictable. Thus, it is not surprising to see the results of AI technologies from Google and IBM (Hiner, 2018; Russell, 2017; Best, n.d.). Even if AI were to advance to match the human intellect, their only way of physically interacting with this world is through robotic bodies. Even the highest quality of robots are prone to failures, given that their developments should be cost effective. Regardless, robotic technicians will be required to diagnose and address any technical issues. Thus, there will always be space for humans.

Moreover, educational institutions around the world are offering courses on robotic systems to advance the technical skills required to work in this field. In fact, there is pressure on the educational sector to teach students to code from a young age (Barone, 2017). Several technology giants, including Apple, are bringing forward their support to educate children on coding practices (*Education - Teaching Code*, n.d.). Since the world is moving forward with technology as its backbone, the people living in it are expected to be well informed of it in a transparent manner.

As for the role of Artificial Intelligence (AI) in jobs of the future, AI systems would engage in cooperation with humans; these intelligent systems would provide humans with relevant data and suggestions to solve a particular task. There is a clear line that distinguishes jobs and tasks when considering the potential of current AI technologies (Pring, 2018). A job is a simple term for the human state of being preoccupied with multiple tasks while benefiting from a source of income; whereas, a task is a piece of work that acts as a subset of a job. It is a definite possibility that in the future, AI systems would complement the human job

workload rather than completely making it obsolete.

It is evident and inevitable, though, that new fields of interest to humans will rise as the depths of our knowledge in existing fields increase. Our future is influenced by a great deal of factors, AI being just one of them. Contrary to the notion that AI would make us unemployed in the future, this intelligence would, in actuality, boost job growth; though, the variety of jobs offered in the future may not be the same as what is offered in the present day. For example, humans may expect titles such as organ fabricator, commercial space pilot, alternate energy consultant, and trash engineer (*9 Top Jobs in 2030: Future Skills You Need To Learn Now*, n.d.). Prior to advancements in AI, it would have been hard to imagine job titles such as “Machine Learning Developer” or “Artificial Intelligence Specialist.” Using the same analogy, we may expect several new job titles in the future as technology evolves.

As jobs evolve over time so do the tools we use. This is evidenced by the history of art; during the 1800s, people had the time and patience to sit for days, months, or even years to complete a single painting, made entirely by hand. Today, we take aid of digital drawing programs and highly precise graphics pen displays or tablets to speed up that process and express our thoughts as they flow. Though, this example does bring into question the value of art and the presence of “human touch,” which, in my opinion, would fade as we move into the future. However, we do not surrender our creativity and intellectual abilities, but express the same in a different form that consumes less time and effort. Artists of the 19th century had brushes and canvases, artists of the 21st century have graphics tablets and digital canvases, and artists of the future may have technologies that combine the use of AI and Augmented Reality (AR), supported by the human brain, to provide everyone with an artistic toolset. This shows that creativity is a human characteristic that cannot simply disappear in the presence of artificial intelligence.

A research paper from Oxford university ([Frey & Osborne, 2017](#)), which claims that AI would take over human jobs of the future, bases its results on assuming that all jobs are repeti-

tive and predictable ([Surowiecki, 2017](#)). This is not true in the real world as its dynamics hold innumerable factors. Consider the case where a robotic machine breaks down in a large scale factory. A human technician is required at this point for analyzing the situation and factoring multiple variables and carrying out an in-depth root cause analysis. Humans are better at decision making as they have a lot more input and background knowledge to work with and consider, which are not just derived from text book sources (*Why humans learn faster than AI-for now*, 2018). Critical situations such as fire emergencies and natural disaster management, where even robots aren't effective, do require human presence (*Why humans learn faster than AI-for now*, 2018). Unless super intelligence is reached, AI is nothing all by itself apart from being a follower of specific instructions given by humans. To reach a future where AI would support job growth and cooperate with humans, three fundamental principles must be established: transparency in actions and decisions, restriction on information collection and access of data sources, and foundation for long-term reliability and trust.

In the far future, we may reach a state when artificial intelligence will prioritize and reorganize our skillsets; humans will think but not do. The creation of objects and physical completion of tasks will be taken care by humanoids powered by intelligent AI, as shown in film adaptations of popular sci-fi novels. Contrary to what is shown in these films, humanoids are less likely to turn against humanity as the three principles, coupled with safety protocols and other measures, would be enforced upon them. Humans would also have to make sure that the AI or AI based systems cannot find a way to bypass these security measures and gain access to unauthorized sections of data and services. In the same way, the general public should also be restricted from gaining privileges to access the core of the AI system. This would keep intelligence away from people who would utilize it for social misconduct, disinformation, and to promote corruption.

With these security measures in mind, humans can look forward to a future filled with cooperation and responsibility. In addition, with heavy investments in nuclear fusion and space mining research ([James, 2018](#)), hu-

mans may soon develop their first zero pollution, sustainable energy resource. This, along with further advancements in AI, would heavily influence the industries including the manufacturing and agriculture sectors. This would eventually reduce global resource prices and reach a stage wherein everyone would have access to resources. The same holds true for global inflation, where we may observe stable and controlled prices.

It is a social responsibility of humans to create a balance with ecology by which robots backed up by AI would contribute to the human community and its wellbeing; food generation, disease prevention, and medical care should be given the first priority. This would help us ensure a balance and mutual trust between AI based technology and humans.

For now, humans should focus on utilizing these intelligent platforms to solve global challenges such as global warming, climate change, and resource management. Furthermore, humans would need to be educated on the potential of such technological developments and refrain from exaggerating future outcomes to a point where it alters the expectations of general public on our future with AI. As change is inevitable, humans would learn to adapt and live with AI powered humanoids and robots in a harmonious manner. This would be accomplished through shedding our highly opinionated self and embracing AI based technologies as our way forward into the future.

In summary, humans will continue to see further advancements in the field of technology and experience its impacts on their lives. In these situations, humans are required to change their mindsets, be informed of the case, and use their ability to adapt to the environment. Artificial Intelligence would play a prime role in future societies. However, despite widespread controversies, AI systems of the future would be cooperative and collaborative with humans, providing them with the necessary data and suggestions to speed up the completion of job related tasks. This may hold true only if strict security measures are taken to ensure that these intelligent systems are not utilized for the wrong purposes. In conclusion, humans may look forward to an interesting future where adaptability is key for hu-

man evolution.

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