Beware: The Singularity Is Almost Here

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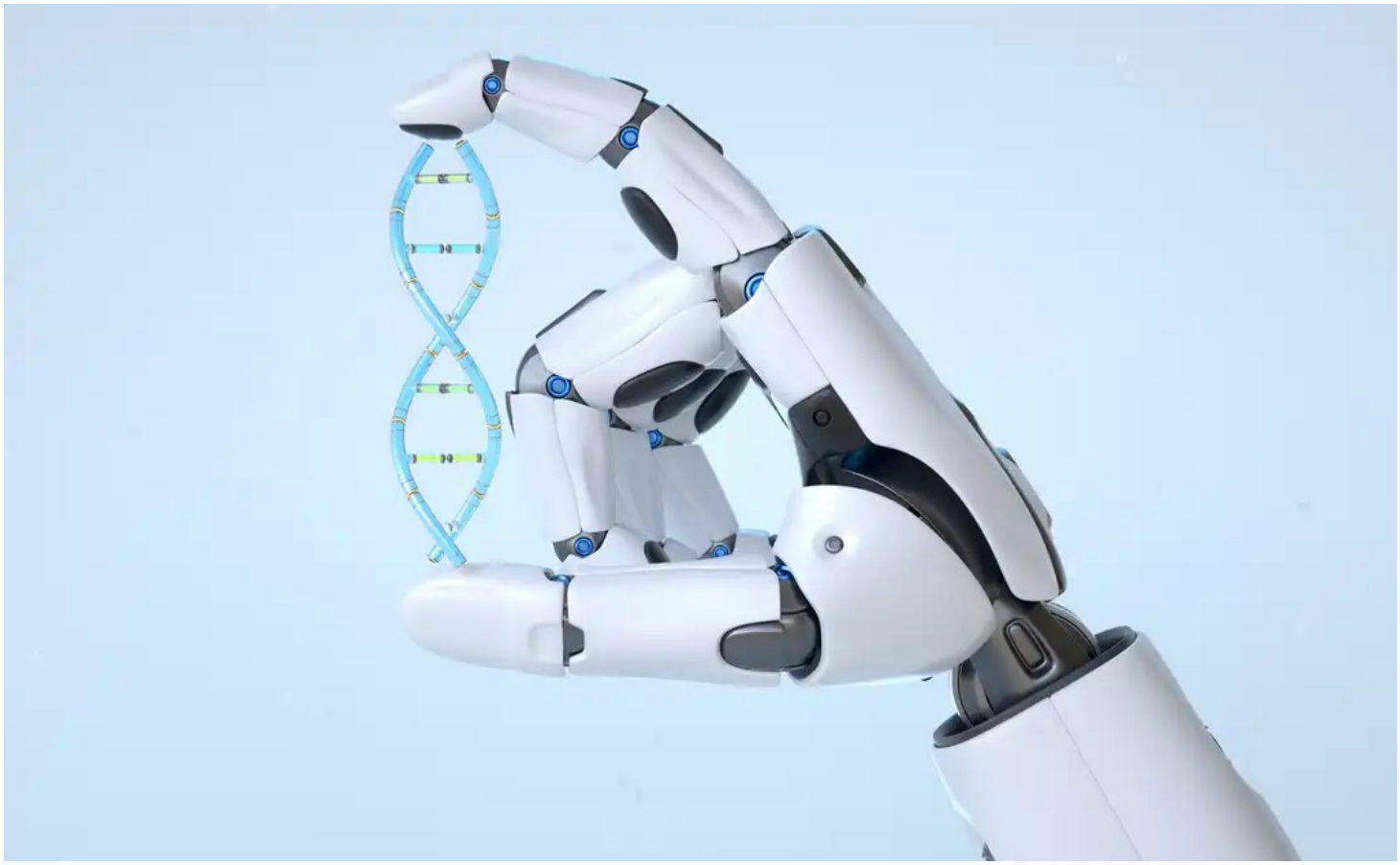
Summary

The singularity is not here yet, but it will arrive very soon.

The economic impact of the singularity may be devastating unless governments and central banks do something about it.

Nothing is currently being done to prepare for the arrival of the singularity.

To survive the arrival of the singularity, companies need to have certain characteristics.



The singularity is driven by AI, nanotechnology and genetics

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Why am I writing this article?

A few weeks ago, I listened attentively to the FOMC press conference of Chairman Jerome Powell. I was surprised that the issue of the layoffs in high tech companies did not take central stage in the questions or in his introductory remarks. This prompted me to research this topic and share the result of my research.

There are many events that are now happening, and the occurrence of these events can be explained with only one thing: The singularity is *almost* Here.

I will start by explaining what the singularity is before talking about the events that are leading me to believe that we are on the crisp of stumbling upon the singularity. The article then addresses the effects of the singularity on our economy and how the central banks and governments need to prepare for its arrival.

The singularity will have a major impact on many industries. Some of these impacts will be positive and some will be negative, and the article addresses these impacts. The article concludes with the characteristics of companies that are going to survive with the arrival of the singularity together with examples of such companies.

What is the singularity?

In 2005 Ray Kurzweil wrote a book titled: "The Singularity is Near: When Humans Transcend Biology". In his book, Ray Kurzweil defines the "singularity" as "a point in the future when technological progress becomes so rapid and profound that it fundamentally changes the nature of human civilization".

According to Kurzweil, the singularity is driven by three interconnected technological revolutions:

> genetics,
>
> nanotechnology, and
>
> artificial intelligence, AI.

As these technologies continue to develop and converge, Kurzweil believes that they will enable us to enhance our physical and cognitive abilities, extend our lifespan, and ultimately merge with machines, leading to a new era of post-human civilization.

Kurzweil has predicted that the singularity would occur sometime around 2045, and that it will be preceded by a rapid acceleration in technological progress, leading to an exponential increase in the rate of innovation and the emergence of powerful new technologies and capabilities. He argues that this will fundamentally transform our world and the way we live, work, and interact with each other, leading to a new phase of human evolution.

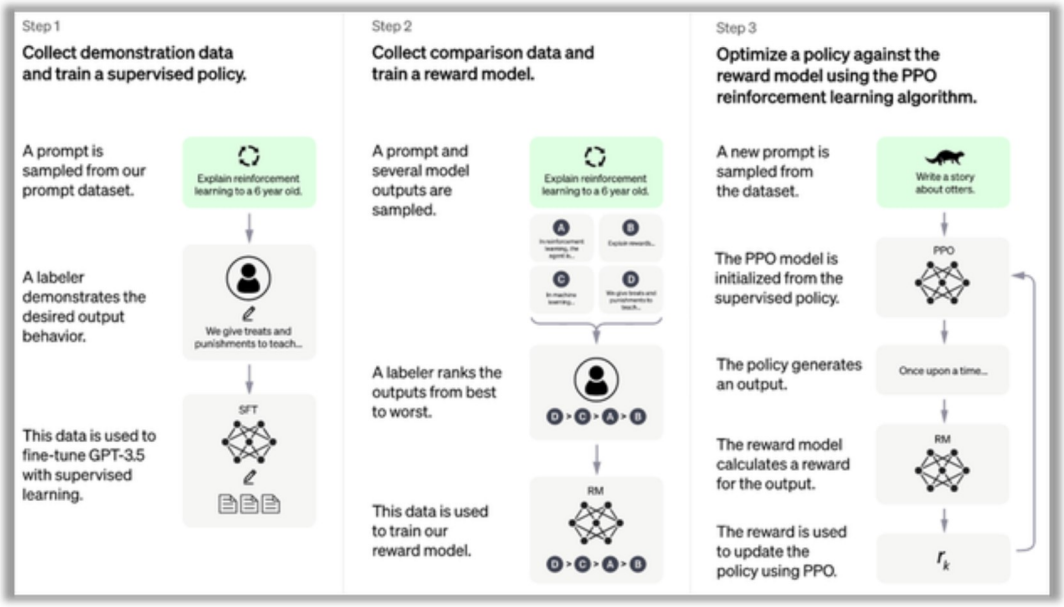
I strongly believe that Ray is not correct predicting the 2045 arrival. I believe that we are less than a decade away from the full singularity as he defined it.

Next, the events that are leading me to make this statement.

What are the AI advancement events?

Following are some of the events that are prompting me to believe that we are close to the singularity from an AI perspective:

The rise of GPT technologies and personal assistants:



Process for training ChatGPT (OpenAI.com)

While Open AI ChatGPT is the most popular, there are many other competitors from other prominent companies including:

Google's BERT and T5.

Facebook's RoBERTa and XLM-R.

Microsoft's XiaoIce and MT-DNN.

Amazon's Alexa and Lex.

Apple's Siri.

IBM's Watson Assistant and Project Debater.

Rasa.

Hugging Face.

NVIDIA's Megatron and Triton.

SalesForce's Einstein.

SAP's Conversational AI.

Pandorabots.

Alibaba's Tongyi Qianwen.

Baidu's Ernie.

Amazon's Bedrock.

In addition to the above transformative Natural Language Processing applications, there are many other *free* AI utilities that can effectively replicate human activities in many areas, including:

FaceApp: The app generates highly realistic transformations of human faces.

Talk To Books: You type a query or statement in the search box, and it discovers books related to that query.

Magic Eraser: It allows you to remove any unwanted objects from your photo while extending the background.

Replika: Allows you to create an AI personality and build a relationship with it.

Elsa: Analyzes speech and acts as an English-speaking coach.

Socratic: Helps students with their homework by providing educational resources.

Character.AI: Users can create characters, including their personalities, and publish them to the community for others to interact with.

Point E: Generates a 3D image based on the text written.

Youper: Helps users deal with emotional struggles by presenting them with different psychological techniques.

DALL.E2: Creates realistic images and art from a description in natural language.

MuseNet: Generates 4-minute musical compositions with 10 different instruments, and can combine styles from country to Mozart to the Beatles.

The above is just a small subset of the utilities available, and new AI-based utilities are created daily.

When first released in 2013, the movie "Her" was strictly science fiction. The technology that we now have (e.g., Replika) can easily replicate the functionality that was depicted in the movie. This documentary shows that there are people who build real relations with their avatars.

The advancements in robotics:

We cannot talk about robotics without talking about the advancements made by Hyundai's (OTCPK:HYMLF) Boston Dynamics and its robot Atlas dancing, back-flipping and somersaulting. Yes, these are choreographed moves, but the AI vision and feedback technologies that allow the robot to keep its balance are really impressive.

With AI vision, we need to mention Tesla, the AI Vision world leader and what they have achieved with self-driving strictly based on vision. Realistically, the Tesla self-driving car is a robot that is relying on AI vision for its movement.

> *Personal Opinion*: *I believe that Tesla made a big mistake by not buying Boston Dynamics instead of Hyundai and not investing in ChatGPT instead of Microsoft. If they had done that, they would have been the undisputed overall AI World Leader.*

Robots are now used in almost every area of our lives, and these include:

- Manufacturing.
- Healthcare.
- Exploration and science.
- Mining.
- Education.
- Entertainment.
- Military and security.
- Domestic services.
- Construction.
- Transportation.
- Warehousing.
- Agriculture.

This is a sample list; It is hard to find an industry where robots and/or automation are not playing a major role in its day-to-day operations.

The proliferation of AI in all aspects of our life:

AI is now part of all aspects of our life and it is very difficult to find an area where AI has not taken big strides in replacing humans. So far, AI is specialized in specific areas, and I expect that soon enough we will find AI that is handling multiple, potentially unrelated, areas. This would be the step towards achieving Artificial Super Intelligence.

The unprecedented terminations happening in high-tech in 2022 and 2023:

2022 and 2023 experienced unprecedented staff reductions *outside* a recessionary period. While most of the layoffs were limited to high tech, this trend is starting to spill off to other industries. I believe that these layoffs are different from layoffs that happened in the past because of the following reasons:

1. The layoffs happened outside a recessionary period.
2. The GDP is continuing to grow.
3. The companies doing the layoffs are highly profitable.

4. The layoffs are focused on the technology and service areas rather than on manual labor.

5. The layoffs are happening amid a tight labor market where job vacancies are at record high levels.

The above characteristics indicate that we are experiencing something very unique that we never experienced before.

2022 experienced a major set of layoffs as demonstrated in the Computerworld timeline, and 2023 also started with a large number of layoffs. Following is a list of some high-profile layoffs that happened in the first three months of 2023:

Company	Announcement Date	Size/Comment
Vimeo	January 4	11% following the 6% cut in July 2022
Salesforce	January 4	10% or 7,000 employees
Amazon	January 5	18,000 employees, following the 10,000 employees in November 2022, (about 1.6%)
Coinbase	January 10	20% or 950 following the 1,100 or 18% in June 2022
Carta	January 11	10% or 200 employees
Informatica	January 11	7% or 450 employees
DirecTV	January 12	10% or 1,000 employees
Microsoft	January 18	5% or 10,000 employees
Sophos	January 18	10% or 450 employees
Alphabet	January 20	6% or 12,000 employees
Spotify	January 23	6% or 600 employees
Arrival	January 30	50% or 800 employees
PayPal	January 30	7% or 2,000 employees
Impossible Foods	January 30	20% or 100 employees
Groupon	January 31	15% or 500 employees following the 500 employees cut in August 2022.
NetApp	January 31	9% or 960 employees
Rivian	February 1	6% or 840 employees; This is the second 6% cut since July 2022.
Pinterest	February 2	4% or 150 employees;
Dell	February 6	5% or 6,500 employees
Disney	February 8	4% or 7,000 employees;
Zoom	February 7	15% or 1,300 employees
Affirm	February 8	19% or 500 employees
GitLab	February 9	7% or 114 employees
Yahoo	February 9	20% or 1,600 employees
GitHub	February 9	10% or 300 employees
Twilio	February 13	17% or 1,400 employees

iRobot	February 13	7% or 85 employees
Jumia	February 16	20% or 900 employees
Twitter	February 26	200 additional employees; The company had laid off more than 70% of its staff since October 2022
Thoughtworks	March 1	4% or 500 employees
Cerebral	March 1	15% or 285 employees; This is the third round of layoffs within a year
SiriusXM	March 6	8% or 475 employees;
Meta	March 14	15% or 15,000 employees; This is in addition to the 13% or 11,000 employees announced in November 2022
Amazon	March 20	9,000 additional employees
Indeed	March 22	15% or 2,200 employees
Lucid	March 28	18% or 1,300 employees
Roku	March 30	6% or 200 employees; this is on top of the 200 employees layoff in November 2022

Source: Compiled by Author from various sources

Despite all these layoffs, in his last press conference of March 22, 2023, Federal Reserve System chairman Jerome Powell did not mention the high-tech layoffs and rather focused on the tightening labor market. *I consider this as a very short-sighted view from the Federal Reserve as it confirms that they are looking at lagging indicators more than leading indicators in their decisions.*

What are the genetic advancement events?

Genetic advancements had the following events:

First Complete Sequence of the Human Genome: The Human Genome Project, completed in 2003, covered about 92% of the total human genome sequence. The final, complete human genome sequence was described in a set of six papers in the April 1, 2022, issue of Science. The benefits for sequencing the human genome include:

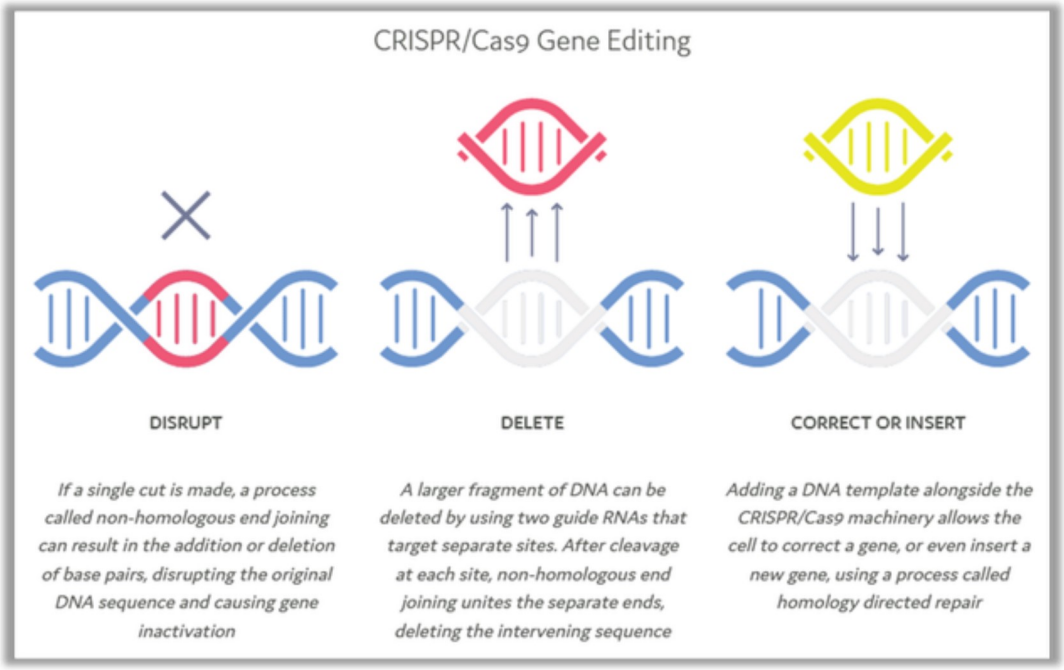
- Advancing our understanding of genetics.
- Identifying genetic predispositions.
- Personalized medicine.
- Advancing drug development, specifically, gene therapy.
- Improving diagnostic accuracy.

Source: National Institute of Health

The mRNA technology: Using mRNA technology in synthesizing the COVID-19 vaccines barely scratches the surface of the benefits of this technology. The benefits include:

> Rapid vaccine development much faster than traditional vaccines at a lower cost.
>
> Creation of vaccines for genetic mutations such as cancer. "Cancer cells often have unique proteins on the surface that are specific to them," explains Dr. Anna Blakney. "With mRNA vaccines, we can train the immune system to recognize that protein and kill it, thereby treating the cancer."
>
> Personalized cancer therapies specifically targeting specific genetic mutations for cancer patients.
>
> Protein production for medical use like insulin.
>
> Potential treatment for genetic diseases by replacing faulty cells or producing missing proteins.
>
> Lower risk of side effects as it encourages the body to produce its own proteins rather than react to a foreign substance.

CRISPR-Cas9 Gene Editing: Clustered Regularly Interspaced Short Palindromic Repeats produced by CRISPR Therapeutics (CRSP) is a revolutionary technology that allows for precise and efficient editing of genes. Cas9 is the CRISPR-associated (CAS) endonuclease, or enzyme, that acts as "molecular scissors" to cut DNA at a location specified by a guide RNA. CRISPR/Cas9 has revolutionized biomedical research and may soon enable medical breakthroughs in ways never seen before.

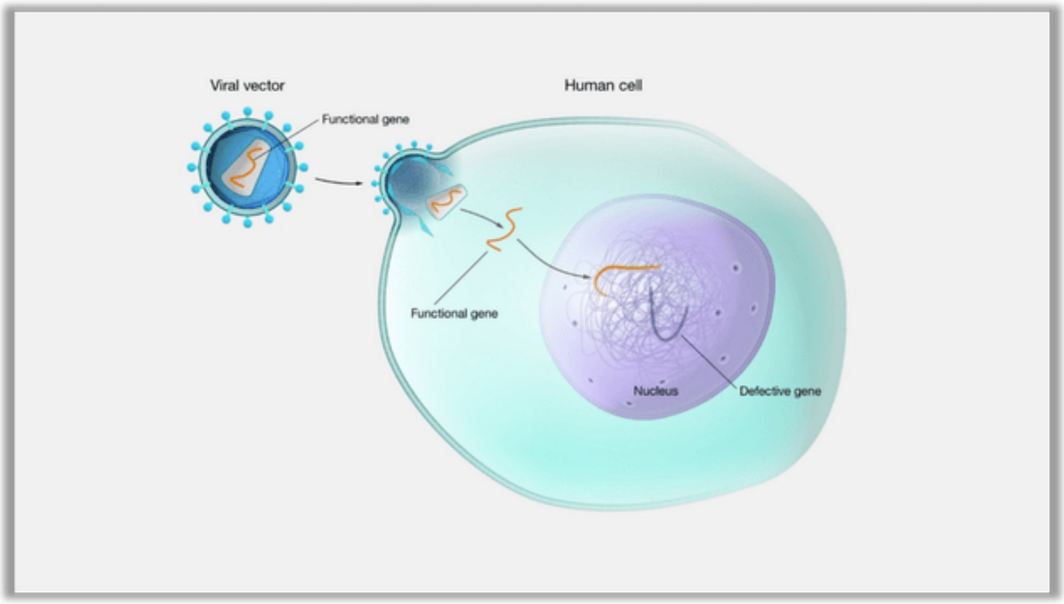


Source: CRISPR Therapeutics

Source: CRISPR Therapeutics

Personalized Medicine: Also known as Precision Medicine is a new frontier for healthcare combining genomics, big data analytics, and population health. Advances in genetics have made it possible to tailor medical treatments to an individual's unique genetic makeup, which can improve the efficacy and safety of treatments. The difference between traditional assessments of complex situations and "personalized medicine" is the degree of reliance on genetic data to make decisions about specific treatment paths.

Gene therapy uses gene(s) to treat, prevent or cure a disease. Recent developments in gene therapy have shown promise for treating genetic diseases by introducing healthy genes into a patient's cells to replace faulty ones. This therapy is also used as treatment for certain sicknesses to target faulty cells, e.g., cancer cells, and prevent them from functioning, thereby providing a treatment.



Gene Therapy (National Human Genome Research Institute)

Epigenetics: Epigenetics studies how the environment can result in changes of how genes work. Unlike genetic changes, epigenetic changes are reversible and do not change the DNA sequence, but can change how the body reads a DNA sequence. Researchers are beginning to uncover the role of epigenetic modifications in gene expression, which could have implications for understanding and treating a wide range of diseases. Because many diseases, such as cancer, involve epigenetic changes, it seems reasonable to try to counteract these modifications with epigenetic treatments.

What are the nanotechnology advancement events?

The National Nanotechnology Initiative in the U.S. defines nanotechnology as the understanding and control of matter at a nanoscale where unique phenomena enable novel applications. Nanomaterials are further defined as substances between 1 and 100 nanometers in size showing physical, chemical and biological properties that are not found in bulk samples of the same material.

The top uses of nanotechnology are:

Materials and coatings: As the National Nanotechnology Initiative explains, using nanotechnology, "materials can effectively be made to be stronger, lighter, more durable, more reactive, more sieve-like, or better electrical conductors, among many other traits."

Medicine: Nanotechnology is used in therapy, diagnostics and drug delivery associated with wide-spread sicknesses, e.g., caner. Covering how nanotechnology can treat cancer is beyond the scope of this article, and an overview is provided in Nanotheranostics: Nanotechnology Advances in the Detection and Treatment of Cancer.

Food science: Nanotechnology can be used to enhance the nature of food during food production and processing. It also preserves and protects food via food packaging that uses nanotechnology. Nanotechnology is also used in targeting nutrients or pesticides throughout the cultivation process. In addition, nanomaterials are used as sensors to detect contamination and regulate the food environment.

Electronics: Transistor sizes on integrated circuits are now getting as small as 2 nanometres from IBM. Transistors smaller than 5 nanometres are getting to be standard with chip manufacturers. Quantum dots are now used to produce more vibrant colors for high-definition displays and televisions. Other applications of nanotechnology in electronics include magnetic random-access memory, wearables, flash memory for mobile devices and nanoparticle copper suspension for fusing electronics.

Energy: Nanotechnology uses plasma-based tools in the recovery of oil and gas. These plasma processes are also used in additive manufacturing and 3D printing. Nanotechnology is also used in enhancing solar cells like the microscopic zinc oxide cones created by Oak Ridge's National Laboratory.

Water and air treatment: Nanotechnology is used to provide cleaner water bodies by removing their pollution. For example, Northwestern University's International Institute of Nanotechnology have developed a lightweight membrane that can eliminate up to 99 percent of phosphate ions from polluted water. Nanotechnology can also be used for protection against airborne viruses, bacteria and other harmful materials via special graphene-silver nanotechnology air filters.

What will the singularity do to the economy?

When the growth of the technology in the areas of artificial intelligence, genetic engineering and nanotechnology become uncontrollable and irreversible, the singularity would have arrived; as mentioned earlier, I am expecting this to happen within the next decade. Although the singularity may not be benevolent, I will take the optimistic view that these technological advancements would be good to humans.

Now, let's talk about *the macro-economic impact of the singularity*.

The traditional economic models will fail when computers become smarter than humans, capable of doing almost everything that humans can do. The productivity will continue increasing, and the prices will thus start dropping. Following are the hallmarks of the economic model after the arrival of the singularity, assuming that the central banks do nothing about the pending singularity arrival:

> *Very high unemployment*, dwarfing the 25% unemployment during the Great Depression of the early 20th century: The singularity will likely eliminate many jobs. This time will be different from the other industrial revolutions when the new jobs created compensated for the lost jobs; the technology that is driving the change, specifically, AI, has the ability to learn from its experience, something that was never encountered in the past.
>
> *Increased productivity leading to a long and strong economic growth cycle*, dwarfing the 6.9% growth that extended for 4 years after the end of the second world war: The cost of production will drop by an unprecedented rate. The drop will not only be the result of manufacturing automation, but for the first time, services automation as well. The cost of customer support has diminished dramatically with the emergence of chat bots and online assistants. Even programming will not be saved from this as will be shown later. I personally don't see an end in sight for this increased productivity on the services side.
>
> *Unprecedented deflationary pressures*, dwarfing the 7% price drop during the Great Depression. The increase in productivity will result in lowering the prices of everything. Even the natural resources production costs could be reduced via automation and advancements in nanotechnology described earlier. Agriculture will be optimized and the same land will yield more crops. Still, services will constitute the biggest drop in prices in my view.

The traditional economic models consider the above hallmarks as conflicting. For example:

> The existing models do not expect high unemployment with increased production and economic growth.
>
> The existing models do not expect deflation to accompany a strong economic growth.

The two major problems that may have large over-reaching economic and social effects are: The high unemployment and the deflationary pressures.

Assuming we do nothing to prepare for the arrival of the potential singularity, the high unemployment could result in social unrest potentially more violent than what we experienced at the beginning of the 20th century with the great depression. The deflationary pressure, combined with the increased productivity and high unemployment, can result in a perpetual depression, the kind of which has never been experienced.

I believe these two challenges will come very fast, and unless we prepare for them, we will not know what hit us.

How should central banks and governments prepare for and react to the arrival of the singularity?

The answer for this question is not easy and it requires thorough analysis and out of the box thinking.

We can do nothing about the reduction in the demand for workers. The need for workers will continue to diminish, and the new jobs created will be far fewer than the jobs lost.

But this does not mean that unemployment needs to remain high. Even with the diminishing need for workers, we can still have full employment by changing the way workers work. A solution here is a three-day work-week. The challenge here is that companies would pay the employees 60% of their compensation if they work 3-day weeks and the reduced pay would fuel the deflation.

As a result, I believe the income of workers needs to be supplemented by the government through the introduction of a Guaranteed Universal Basic Income (GUBI) regime.

GUBI is not alien to most of us. We had it during COVID. However, the inflation that ensued from the COVID financial distributions were because of the perfect storm that happened through the following events:

> Supply Chain Problems.
>
> Zero COVID Policy in China.
>
> OPEC(+) Reduction of Oil Production.
>
> Reduced productivity because of work-from-home policies.
>
> Russia/Ukraine War.

I explained these events in detail in my earlier article: "Governments and Central Banks Made a Bet and Lost; Will They Learn?"

How would the GUBI be financed?

Any attempts to finance the GUBI via increased income taxes would have a negative impact on the economy. Increased taxes would result in reduced spending, increased deflation and would sink the economy into a deep long depression in my view.

Changing the structure of taxes and having a focus on the Value Added Taxes, VATs, would NOT be the right thing to do either as it would also reduce spending, and this would have a deflationary effect.

Eliminating VATs may be the right thing to do. However, this would leave a gap in the funding required for the GUBI. Replacing the VAT with income taxes may be an option, but would not be a politically popular option.

A flat income tax structure may encourage spending for higher earners, which would be ideal to fight deflation. However, combining it with GUBI, lower and middle-class earners may construe it as paying with one hand and taking the money with the other hand; this would not be a politically popular option either.

Reducing government spending would not work either for funding the GUBI. Reducing government spending is deflationary.

This leaves us with only one source of funding: quantitative easing. This would not be different from what we have done with COVID, except that this time it would not cause high inflation unless we hit another perfect storm.

Quantitative Easing would solve the two problems concurrently: It would fund the GUBI, thereby supplementing the income for partial work weeks and reducing unemployment, and at the same time eliminate the deflation while keeping the inflation in check.

Now, let's look at the potential *micro-economic effects of the singularity* from a corporate perspective:

Which companies will the possible singularity damage?

In general, I believe the companies that refuse to adopt AI at an integral part of their operations will suffer significantly with the arrival of the singularity. The specific industries of these companies include:

1. Service companies would be the first to suffer. Examples include audit firms, legal firms and consulting firms. These companies will not be able to charge the high fees they are currently charging with computers effectively providing the same service that they are providing at a fraction of the cost.

2. Software companies that are not specialized in AI will suffer from the arrival of the singularity. Even now, before the singularity arrival, computers are capable of writing most of the code required by programmers. For example, Andrej Karpathy, claims that Microsoft's GitHub Copilot writes 80% of his code. With the drop in the cost of software development, software companies would need to look for other sources of revenue as the barriers to entry drop and new competitors would force them to drop their prices.

Andrej Karpathy Tweet about Copilot (Twitter)

3. Banks and financial services companies could be severely disrupted by the arrival of the singularity. Historically low inflation and interest rates will reduce the net interest margin, a key measurement for the bank profitability. Perpetual quantitative easing would increase the money supply and the productivity gains will keep the inflation in check. The introduction of robo-advisor would turn their services into a commodity and reduce their margin from wealth management.

4. Traditional media companies will have a big challenge competing with the advancements that are happening with AI. AI can now write articles that are arguably as good as human writers. TV anchors can be easily replaced with computer generated avatars. In addition, readers and viewers do not rely on traditional media companies as they used to do in the past, especially with the younger generations.

5. Traditional retail companies that do not adopt AI strategies will not be able to compete with companies adopting AI to personalize the shopping experiences. Recommendation systems also need to move to the brick-and-mortar establishments. While these AI applications are normally provided online, there are also attempts in providing personalization for traditional brick-and-mortar establishments.

I just wanted to confirm that I am not implying that these industries will disappear but rather that I think companies in these industries that are using AI and other technologies related to the singularity will displace companies that are not; unless companies in these industries adopt a paradigm shift, they would likely not survive.

Which companies will benefit from the singularity?

I will provide here certain characteristics of these companies. If you are looking at investing in a specific company, and find that it has these characteristics, then it will most likely be a good long-term investment opportunity in my view:

Data-driven: Companies that generate huge amounts of ***unique*** data from its operation and use this data for training its AI systems, will be well-positioned to benefit from the arrival of the singularity; AI systems rely and learn from data to operate. Examples of these companies include Apple (AAPL), Tesla (TSLA) and Walmart (WMT).

Innovation-driven: Companies that are on the leading edge of technology and experimenting with new approaches will benefit from the advancements in the technology. The world is changing extremely fast, and innovation needs to be part of the culture of these organizations. Examples of these companies include John Deere (DE), Illumina (ILMN) and Lockheed Martin (LMT).

Customer-centric-driven: Understanding customers and personalizing their experience is essential for the survival of companies after the singularity arrives. Having a customer-centric operation may well be the last competitive advantage that companies that would allow companies to compete against automated operations, which are starting to prevail. Examples of these companies include Amazon (AMZN), Costco (COST) and Disney (DIS).

Fast and agile: With the speed of changes accelerating with the arrival of the singularity, companies that are able to adapt to the changes quickly are the ones that would be able to thrive in this environment. Examples of some large companies in this category include Alphabet (GOOG), (GOOGL), Microsoft (MSFT) and Tencent (OTCPK:TCEHY).

Technologically adept: Companies that are established on strong technical foundations, and have a culture that allows them to integrate different technologies and complex systems will be more competitive in the new singularity era. Examples of these companies include Alibaba (BABA), IBM (IBM) and Samsung (OTCPK:SSNLF)

Conclusion

The speed at which technology is changing has exceeded the expectations of the wildest futurists. We have not yet seen the full economic impact of these fast changes, although glimpses of what is coming are starting to emerge with the layoffs on the high-tech side.

I expect that the economic impact will be coming very fast and believe governments and central banks need to start preparing for it *now.* The changes required to the economic model are massive, and cannot be enacted with the existing fiscal and monetary tools in my opinion.

I am underwhelmed by the fact that governments and central banks are not taking an immediate action to prepare for the arrival of the singularity. I believe we are on the cusp of a new technological era never experienced before, and immediate action needs to be taken to prepare us for countering its potential disastrous economic impacts.

Editor's Note: This article discusses one or more securities that do not trade on a major U.S. exchange. Please be aware of the risks associated with these stocks.

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