



# Board of Mentors Newsletter

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## How are technologies used to predict a country's economy?

*By Ka Kit Leng*

In ancient times, measuring the wealth of a kingdom was done by counting the number of livestock and crops. Today, economic indicators such as Gross Domestic Product (GDP), unemployment rates, and inflation are used to gauge the health of a country's economy. While these indicators provide a more sophisticated way to understand economic performance, they are not without their limitations. As the economy continues to change, we must continually adapt and refine these indicators to ensure they accurately reflect the reality of our modern world.

Economic indicators are crucial for understanding the performance of the economy, and they are used by policymakers, investors, and businesses to make informed decisions. However, the accuracy of these indicators is not always guaranteed, and they are constantly evolving as our economy changes. With the ever-increasing pace of technological development, it has become imperative to improve the accuracy of predicting economic indicators. This raises important questions such as: how can we better leverage technologies to improve forecasting? How can we ensure that these new methods of economic measurement are reliable and transparent? These are just some of the pressing issues facing economists and policymakers today as they seek to improve our understanding of the economy.

Here are a few technologies that can be used to predict a country's economy:

### 1. Big Data

The internet and digital devices have given us access to an unprecedented amount of data about consumer behavior, supply chains, and economic activity. This data can be used to create more accurate and timely economic indicators, such as tracking consumer spending patterns in real time.

### 2. Machine Learning

Machine learning algorithms can analyze large amounts of data and identify patterns that humans might miss. This technology can be used to forecast economic indicators with greater accuracy and speed than traditional methods.

### 3. Blockchain

Blockchain technology can be used to create more transparent and efficient systems for tracking economic activity. For example, it can be used to track supply chains and verify the authenticity of products, reducing the risk of fraud and improving the accuracy of economic data.

While these examples illustrate the potential of technology to improve economic indicators, its use is not without challenges. The use of big data raises questions about privacy and data ownership, and machine learning algorithms may not always be transparent in their decision-making processes, raising concerns about bias. In conclusion, economic indicators have been part of human history since the earliest civilizations. However, as technology continues to evolve, we can expect further changes in the way we measure and analyze these indicators.

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## **Brief history of Artificial Intelligence**

*By Aylin*

*Aytemiz*

Especially during the second part of last year, artificial intelligence started to become a bigger part in our lives. Many people started to take advantage of it in many ways such as, finding their parents the right laptop by just entering the features they wanted and make it list the options in their price range or asking for a simple recipe that they couldn't find on google or anywhere else. There are many more areas that artificial intelligence can be so powerful and improve the life of humans. Well, what inspired to build such a thing? Whose idea was it? How did they come up with something this useful when the technology today didn't even exist? I did some research regarding to this and what I have found amazed me in many ways.

Let's start from the beginning. Back in early 1700's in Jonathan Swift's novel "Gulliver's Travels" mentions a device called "the engine". The purpose of this machine was to make people smarter and better at doing things. It does this by using a computer system that acts like an intelligent being. This was the earliest references to modern-day technology. In 1872 author Samuel Butler also wrote about it in his novel "Erewhon". Afterwards, in 1921 a Czech playwright, Karel Čapek released his science fiction play "Rossum's Universal Robots". He mentioned the concept of artificial people who he called robots. It is very surprising to me, especially when we think about it today how different fields software engineers and authors are working, an author was the inspiration of the amazing technology we are using to this day.

Even though AI has always been mentioned throughout the history it didn't began to take shape in the real world until the mid-20th century. In the 1940s and 50s, Alan Turing and John McCarthy laid the groundwork for modern AI with their research into computational theory and symbolic reasoning. In the 1970s and 80s, AI was becoming more and more popular. Movies and TV shows like "Battlestar Galactica" and "Terminator" also mentioned this technology. Besides this, expert systems were developed to provide specialized knowledge and decision-making abilities in specific domains, while natural language processing allowed computers to interact with humans in more human-like ways.

In the 1990s, machine learning became a major focus of AI research. This involved the development of algorithms that could learn from data and improve their performance over time. In recent years, deep learning has emerged as a major area of focus in AI research. This involves the use of artificial neural networks with many layers of interconnected nodes to learn from large amounts of data and make complex decisions. Deep learning has achieved remarkable success in applications such as image recognition, speech recognition, and natural language processing.

Today, AI is an increasingly important part of our lives. The development

of it throughout the years is brilliant. Knowing the history of it and what inspired it makes it more understandable and interesting. AI has the potential to revolutionize various industries, from healthcare to transportation. As it continues to advance, it's essential to consider the ethical implications and ensure that it's used for betterment of all of us.

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## **Could Machine Learning lead to the cure of Bacterial Diseases?**

*By Martina*

*Veit Acosta*

Protein metabolic pathways are similar to Charles Chaplin's "Modern Times" movie released in 1936. In the movie, the semi-finished product in the factory moves from workstation to workstation where new parts are added in sequence until the final assembly is produced. Imagine that proteins are the semi-finished product and ligands are the added parts. Protein metabolic pathways consist of proteins binding to different ligands in each "station" of the process and changing the protein-ligand complex conformation. The accuracy in which the proteins bind to their ligands is essential to all life processes since these chemical interactions comprise biological recognition at the molecular level. In case of a pathogenic bacteria, having the right ligand could lead to the discovery of new drug targets to end the bacteria's metabolic pathway, and therefore stop the disease from spreading in the body.

Machine learning has been widely used towards Drug Discovery research in the past years and the future looks promising. Its techniques improve the decision-making in pharmaceutical data across various applications. In the metabolic pathway example, Machine Learning can be used to predict the affinity between proteins and their ligands, and therefore decide which ligand (drug) to use in the case of bacterial diseases to decisively end the proteins metabolic pathways. We can use computational models to predict the binding affinity of a potential inhibitor for an enzyme and such knowledge has the potential to speed up drug discovery and decrease the cost of development of new drugs.

There is a ton of research being conducted in the Drug Discovery field employing Computer Scientists that could potentially change the way we perceive modern healthcare. Machine learning approaches provide a set of tools that can improve discovery and decision making for well-specified questions with abundant, and high-quality data. The challenges of applying ML lie primarily with the lack of interpretability and repeatability of ML-generated results, which may limit their application, and consequently give room for innovations to arise in the field. This is a perfect example of how interdisciplinary knowledge can be applied to improve science, and even save lives across the globe!

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## **A day in the life of a software engineer with an AI assistant**

*By*

*Joseph George*

Your daily alarm goes off with a soothing music from your playlist. After morning routines, the AI assistant lets you know your priorities for the day, both personal and work related and efficiently lets you know a to-do list. Once that's done, the daily hustle starts. From feature development to bug fixing and issues in production, you're let known of a number of

tasks that are identified based on priorities and deadlines. Now that you're aware of it, instead of googling it from Stack Overflow, the assistant tells you what the best solution could possibly be based on the common sense that's prevailing among software engineers.

As we all know, the AI right now could be as smart as the smartest human and nothing more than that. That too, if the data it's being trained with is well curated, avoiding bias and junk information in the internet. You could be an average engineer but with your critical thinking abilities you are probably developing the most efficient code someone could come up with. So, now is AI really a threat for your job? All the mundane tasks that involves research and analysis is done with AI's help and you solve your tasks at hand much faster. A world that get rids of redundancy and working much more efficiently. You could be achieving your goals at a much faster rate. Now, the next generation of AI's could learn from these coding patterns and designs to have even little human intervention.

Is AI still a threat for your job? Not really, because the applications that took thousands of hours literally could just take couple of seconds or minutes to develop and as a software developer you could still work on the code that makes the AI assistants better at adapting to different environments and businesses. Businesses and institutions would definitely need fewer people to do these jobs but what they could be accomplishing with experimentation and research could be much more. A digitally literate engineer could do that but not an AI at this point in time. But could there be an AI that surpasses human intelligence? My answer to that, we don't know that yet but we are not there at this point in time.

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*The Google Developer Student Club at WMU is a student organization focused on nurturing the development of technical skills within its members and community, as well as applying those technical skills to solve real-world problems. Our mission is to empower our community with the resources, education, and experience they need to create imaginative technological solutions to the problems facing society. Our vision is to be a hub of student-led innovation, inspiring technological growth within our community. This article is written in accordance with the Board of Mentors program by GDSC WMU.*

