Google Developer Student Clubs

Board of Mentors Newsletter

#4 | April 2nd, 2023

The economics of cloud computing

By Ka Kit Leng

Cloud computing has revolutionized the way businesses store and manage data, enabling them to reduce costs and increase efficiency. But what are the economics of cloud computing, and how is it changing the business landscape?

The basic idea behind cloud computing is simple: instead of hosting your own servers and software, you rent computing resources from a third-party provider, who provides them as a service over the internet. This approach offers many benefits over traditional on-premises computing, including:

- Cost saving:

By renting computing resources from a cloud provider, businesses can avoid the upfront capital costs of buying and maintaining their own hardware and software. They can also benefit from economies of scale, as cloud providers can spread the cost of their infrastructure over a large customer base, reducing the cost per user.

- Flexibility:

Cloud computing allows businesses to scale their computing resources up or down as needed, depending on changes in demand. This means they can avoid the costs of over-provisioning or under-provisioning their own infrastructure and can respond quickly to changing business needs.

- Security and reliability:

Cloud providers offer a high level of security and reliability, with multiple redundant systems and sophisticated backup and disaster recovery plans. This can be especially important for small businesses that may not have the resources to build their own secure and reliable infrastructure.

So how do these benefits translate into economics? There are a few key factors to consider:

- Cost of ownership:

When businesses buy their own hardware and software, they incur not only upfront capital costs, but also ongoing costs for maintenance, upgrades, and replacement. Cloud providers, on the other hand, handle these costs themselves, and offer predictable monthly or yearly pricing that is easier to budget for.

- Time to market:

Cloud computing allows businesses to quickly spin up new services or applications without having to invest in new hardware or software. This can give them a competitive advantage, as they can bring new products to market faster than their competitors.

- Business agility:

Cloud computing allows businesses to quickly adapt to changing market conditions, as they can scale their computing resources up or down as needed. This can help them stay nimble and responsive to customer needs, without incurring the costs of maintaining their own infrastructure.

Of course, there are also some potential downsides to cloud computing,

such as vendor lock-in, data privacy concerns, and the risk of service outage. But overall, the economics of cloud computing are compelling and are driving many businesses to embrace this technology.
In conclusion, cloud computing is changing the way that businesses think about their IT infrastructure and is offering many benefits in terms of cost savings, flexibility, and reliability. While there are still challenges to overcome, the economics of cloud computing suggests that this trend is likely to continue and will shape the business landscape for years to come.

How Big Data is Changing the Business Landscape

By Aylin Aytemiz

In today's digital age, companies are collecting more data than ever before. From customer data to sales data and even social media data, there is a wealth of information available to businesses. But how can businesses make sense of all this data? That's where big data comes in.

Big data refers to the vast amounts of data that are generated and collected by companies. This data can be analyzed to gain insights into customer behavior, market trends, and business operations. With the help of big data analytics, businesses can make more informed decisions, improve their operations, and gain a competitive edge.

One of the biggest benefits of big data is its ability to help companies gain insights into customer behavior. By analyzing customer data, companies can gain a better understanding of their customers' needs and preferences. This allows them to tailor their marketing efforts and product offerings to better meet the needs of their customers.

Big data analytics can also help businesses improve their operations. By analyzing operational data, companies can identify areas for improvement and make changes to their processes to increase efficiency and reduce costs. For example, a logistics company can use big data analytics to optimize their delivery routes and reduce fuel costs.

Another area where big data is having a significant impact is in risk management. By analyzing data from various sources, including social media, companies can identify potential risks and take steps to mitigate them before they become major issues. This can include everything from identifying fraud to predicting and mitigating supply chain disruptions.

In conclusion, big data is changing the business landscape in a variety of ways. By analyzing vast amounts of data, companies can gain insights into customer behavior, improve their operations, and mitigate risks. As more companies begin to embrace big data, it will continue to play a crucial role in driving business success. We hope you found this newsletter informative and look forward to sharing more about the exciting world of big data in the future.

How was bioinformatics used in the Human Genome Project?

By Martina Veit Acosta

The Human Genome Project (HGP) was one of the most ambitious and complex scientific endeavors in history and involved a multidisciplinary approach, including biology, genetics, chemistry, computer science, and engineering with the goal of determining the sequence of nucleotide base pairs that make up human DNA. Launched in October 1990 and completed in April 2003, the Human Genome Project's signature accomplishment provided fundamental information about the human blueprint, which has since accelerated the study of human biology and improved the practice of medicine.

Bioinformatics is an interdisciplinary field that combines biology, computer science, mathematics, and statistics to analyze and interpret biological data. It played a critical role in the HGP by providing the computational tools and methods necessary to analyze and interpret the vast amounts of data generated by the project. Here are some examples of how bioinformatics was used in the HGP:

1. Comparative genomics: Bioinformatics tools were used to compare the human genome to other genomes, such as those of other mammals, to identify similarities and differences. This helped to identify important functional elements of the genome, such as protein-coding genes, regulatory sequences, and non-coding RNAs.

2. Gene prediction: Another important task was to identify the locations of genes in the genome. Bioinformatics tools were used to predict the locations of genes based on known gene sequences and other features of the genome.

Overall, bioinformatics played a crucial role in the success of the Human Genome Project, and its methods and tools continue to be used in genomics research today.

Combating Climate Change Using AI

By

Joseph George

Global politics has been discussing climate change for a while and it's believed if emissions are not cut by half by 2030, several tipping points will be triggered, and we would see a much larger impact in the near future. From sea level rising to forest fires, the impact on environment is much larger and with ~1.1 degrees Celsius of Global warming, we may have already crossed some tipping points. More to happen if we surpass the 1.5-degree threshold. With improved climate modeling and observations using AI, these assessments have been made even better and give us more insight to combat climate change around the world.

Mitigating it means limiting global warming to no more than 1.5 degrees Celsius, which needs global shift by developed countries responsible for the majority of historical emissions. This wouldn't just require us to move to electric vehicles. Even though fossil fuels are the major contributor to greenhouse gases, it's not just automobiles that' just causing it. From manufacturing goods to the entire supply chain management, we see emissions everywhere. To access the emissions at each level, we would need to monitor at both macro and micro-levels and calculate the carbon footprint from remote carbon natural stock to individual products. Satellite and IoT data could be used to gather and fill the gaps in rather sparse data to model the impacts on environment.

In order to mitigate the emissions, renewable energy with lesser carbon footprints needs to be made available, encouraging behavioral change such as using public transportation more or reducing meat consumption. Policy makers could use climate-risk analytics to model these effects and their impact on the environment. AI could further be used to monitor deforestation and other encroachments on natural reserves, optimize supply chain and simulate environments. Among the many applications AI has to combat climate change, we also need a system in place to warn about extreme weather events and be resilient about them. Modeling sea-level rise to near-term predictions of cyclone, wildfire and floods are few. Also, intelligent irrigation, identifying and counting species to large scale migration patterns are needed. Lastly, to encourage climate-positive behaviors, climate finance to forecast carbon prices is necessary and model the socio-economic impact.

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.

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