EW Customized Tutor

English, Economics, Politics, and Philosophy

Unit 3 Cases in Business
Lesson 3.3: Jensen Huang and Nvidia

Pertinent Topics:

- Jensen Huang
- Organic vs Mechanistic management
- Nvidia
- Graphic Card and cryptocurrency

structure

crypto(encoded/locked) - currency(money)

digital currency

Success Criteria:

- I will be able to identify Huang's managerial style
- I will learn the about Nvidia's mission statement
- I will understand how Nvidia has contributed to the development of cryptocurrency

MINDS ON

座右銘 important quote

One of Huang's famous motto states "our company is thirty days from going out of business." From the studies we have done on other entrepreneurs, about to going out of business seems to be something they all have experienced at least once. However, Huang is the only one amongst them who have turned such 'pessimistic' statement into a realism reflective motto of his organization. What might be his reasons/motives?

Maybe he's afraid that his business will go down one day
He's recognizing the possibility for its organization to fail at any moment (so prepare for the worst)
"be ready to adapt!"

I. Jensen Huang

Jensen Huang was born in Tainan, Taiwan, in 1963 and moved with his family to Thailand when he was five. At nine, he and his older brother were sent to the United States to live with an uncle in Tacoma, Washington, later residing in a boys' dormitory at the Oneida Baptist Institute in Kentucky. After his family relocated to Oregon, Huang completed high school early, graduating at sixteen from Aloha High School. He then pursued higher education in electrical engineering, earning his undergraduate degree from Oregon State University in 1984 and a master's from Stanford University in 1992. These academic achievements and his technical background would be essential as he embarked on his career in technology.

A. Career

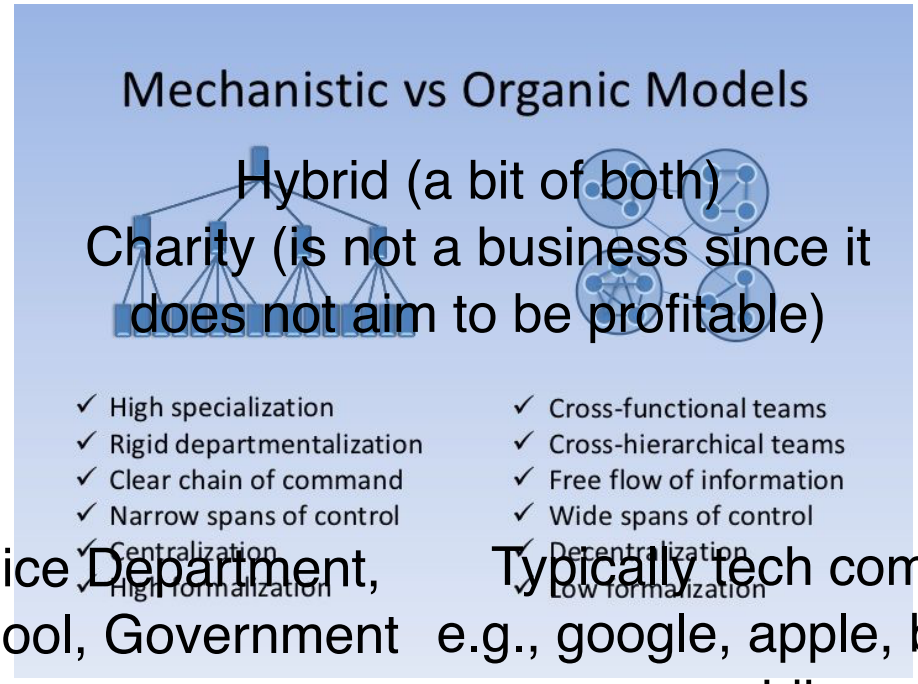
In 1993, at the age of 30, Jensen Huang co-founded Nvidia alongside Chris Malachowsky and Curtis Priem, holding their first meeting at a Denny's in East San Jose. Despite their ambition, Huang recalled that the three founders had "no idea how" to start a company, and the process turned out to be "a million times harder" than they had anticipated. Huang formally signed Nvidia's Articles of Incorporation on April 5, 1993, assuming the roles of CEO and president. Initially, Nvidia focused on developing graphics accelerator chips that used quadrilateral primitives for texture mapping, a direction different from the triangle-based approach preferred by competitors. This decision nearly proved fatal, but Nvidia managed to survive thanks to a $5 million investment from Sega, which allowed the company to pivot its approach and continue operations. Reflecting on those challenging years, Huang said that if they had known upfront about "the pain and suffering" involved, they might not have pursued the venture. Yet, the struggles only

deepened his resolve and honed his leadership skills, which became instrumental in Nvidia's growth.

Nvidia's early days were marked by an urgency that Huang instilled as a core part of the company's culture. Nvidia's financial situation was often precarious, and the company came close to running out of cash several times. At one point, Nvidia had only one month's payroll left, an experience that left an indelible mark on Huang. This crisis led to what became an unofficial motto: **"Our company is thirty days from going out of business."** For years, Huang began his presentations to Nvidia staff with these words, a reminder of both the fragility of the business and the intensity required to succeed. He credits these difficult times with shaping his leadership style, teaching him to value resilience, adaptability, and a sense of urgency.

He values a flat management structure, with around 50 direct reports, believing that those who work directly with him "should be at the top of their game" and "require the least amount of pampering."

II. Organic vs Mechanistic structures



Bank, Police Department, Tesla, School, Government

Typically tech company, e.g., google, apple, binance, nvidia

In managerial theory, an organization structure is often divided into a dichotomy: organic vs mechanistic. An organic structure is characterized by its emphasis on free communication/decentralization/flat hierarchy/ and adaptability.

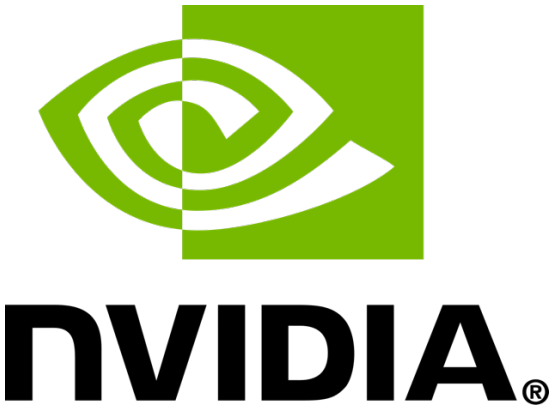
Recall Charles Darwin (father of evolution)
- Survival the fittest := adaptable the survival

Whereas a mechanistic structure adheres to a more traditional way of management. It is characterized by its top-down hierarchy, centralization of authority, rigid formalization and high specialization

Competitive Advantage: unique advantage that differentiate an organization from others

III. Nvidia

A. Mission Statement



NVIDIA pioneered accelerated computing

to tackle challenges no one else can solve. Our work in AI and digital twins is transforming the world's largest industries and profoundly impacting society.

Before we get into what exactly NVIDIA does, let's watch a video: Jensen Huang-The First Six Months of NVIDIA.

What are some important criteria venture capitalist values in a start-up according to Huang?

B. Prominent Contributions to technology

First Graphics Accelerator: Nvidia's journey into graphics technology began with the NV1, their first graphics accelerator product, which was designed for processing quadrilateral primitives—a method Nvidia initially favored for texture mapping. However, Microsoft's DirectX platform set a new standard by only supporting triangles, requiring Nvidia to pivot. Despite initial setbacks and a missed opportunity with Sega, this challenge pushed Nvidia to refine its approach. In 1997, Nvidia launched the RIVA 128, a graphics accelerator optimized for triangle processing, which aligned with industry standards and became a success. The RIVA series established Nvidia as a major player in graphics technology, paving the way for the launch of the GeForce line and Nvidia's leadership in GPU innovation.

to adapt

Nvidia Tesla and Deep Learning: Nvidia's **Tesla** line marked a significant evolution, designed specifically for high-performance computing and scientific applications rather than gaming. Tesla GPUs provided massive computational power, optimized for parallel processing, making them suitable for machine learning and deep learning tasks that required processing large datasets efficiently. In 2009, Nvidia's role in the "big bang" of deep learning emerged as researchers discovered that the massive number of cores in GPUs could accelerate deep neural networks substantially. For example, Andrew Ng's team at

Google Brain demonstrated that GPUs could speed up deep learning computations by nearly 100 times, revolutionizing the field and catalyzing the growth of AI.

The Tesla GPUs found wide application in deep learning frameworks thanks to Nvidia's CUDA platform, an API that allowed developers to utilize GPU cores for parallelized BLAS operations essential in machine learning. Tesla GPUs became an industry standard, powering AI research across tech companies, research labs, and large enterprises, including companies like Tesla, Inc., before they developed their proprietary chips. Tesla GPUs also enabled cloud computing platforms—such as Google Cloud, AWS, and Microsoft Azure—to offer GPU-powered instances, bringing powerful computing resources to a broader audience.

Nvidia DGX Supercomputers: The **DGX series**, introduced by Nvidia in 2016, is a line of supercomputers specifically designed to handle the computational demands of deep learning. The first model, the DGX-1, contained an eight-GPU cluster and came preloaded with Nvidia's deep learning software, significantly reducing setup time for AI researchers. For instance, Nvidia donated a DGX-1 to OpenAI, which reduced training times for complex AI models from six days to just two hours. The DGX line further expanded Nvidia's influence in AI, making it

easier for researchers and developers to work on advanced neural networks and models.

By combining GPU power with integrated software solutions, the DGX systems quickly became a standard for AI research in institutions globally, enabling complex simulations, language models, and other data-intensive applications. Nvidia's deep learning ecosystem has grown to include dedicated SDKs, like the Nvidia Deep Learning Software Development Kit, further simplifying the process of developing and deploying deep learning applications.

Hard Supply vs Soft Supply (technology sector)
Tangible vs Intangible
H: Hamburger; S: Service
H: GPU (component of a computer); S: internet(network)
H: server; S: software (e.g., apps, codes)

By company:
H: Tesla, ASUS,TSMC, Nvidia; S: OpenAI, Google, Meta

bartering (seashell)
coins (metal)
bills (banknotes)
bank system (mobile banking)
crypto-currency (decentralization)

Dependency:=rely

C. Graphic Card and Cryptocurrency

GPU

Cryptocurrencies are a form of digital or virtual currency that relies on cryptographic technology to secure transactions, control the creation of new units, and verify the transfer of assets. Unlike traditional currencies issued by governments (like dollars or euros), cryptocurrencies operate on decentralized networks, typically based on blockchain technology. A blockchain is a distributed ledger that records all transactions across a network of computers, ensuring transparency and security without the need for a central authority. The most well-known cryptocurrency, Bitcoin, was introduced in 2009 as a peer-to-peer electronic cash system, and since then, thousands of other cryptocurrencies, such as Ethereum, Litecoin, and Ripple, have been created for various purposes.

In addition to serving as alternative forms of currency, many cryptocurrencies enable decentralized applications (dApps) and smart contracts. These smart contracts automatically execute predefined actions when certain

blockchain technology:= is a solution for non-mediated transaction
downside: cryptocurrency is not regulated thoroughly;
hence black market

conditions are met, creating new possibilities for secure, trustless interactions in finance, supply chain management, and more. The decentralized nature of cryptocurrencies means that no single entity has control over them, which has driven both interest and skepticism. For instance, Bitcoin and Ethereum rely on a process called “mining” to validate and secure transactions on the network, rewarding participants with newly minted coins. This mining process is central to cryptocurrencies’ functionality and requires considerable computing power, which is where Nvidia’s role becomes significant.

Nvidia’s GPUs are crucial to cryptocurrency mining because their high parallel processing power makes them ideal for the complex calculations required in mining. Cryptocurrencies like Bitcoin and Ethereum rely on a process called "proof of work," which involves solving cryptographic puzzles to validate transactions and secure the network. Nvidia’s GPUs, with their thousands of cores, excel at these repetitive calculations, allowing miners to process transactions faster and earn rewards efficiently.

The demand for GPUs surged with the growth of cryptocurrency mining, as Nvidia’s graphics cards offered a balance of speed and energy efficiency. Nvidia responded to this demand by introducing dedicated "CMP" (Cryptocurrency Mining Processor) cards, specifically optimized for mining while preserving its

core GPU line for gaming and other uses. This role has positioned Nvidia as a key player in the hardware backbone of cryptocurrency mining infrastructure.

Q: Do you think cryptocurrency will become a new form of standard currency? As of today, we typically refer to USD as the standard currency due to the pricing unit in petroleum/gasoline; with the invention of cryptocurrency and the realization of the idea, metaverse, digital currency is becoming more and more demanded. It also prevents failures in monetary/fiscal policy in politically unstable states.