

## **Brief number 3: Business Models in Technology**

**By Pei Xin, GIOAS Research Associate**

High investment costs, especially R&D, mean that the right choice of business model (how to make money or monetize technology) is key to success of all technology-related companies. Other than commodities, most manufactured product embody different degrees of knowledge or software (services). In one sense, the more knowledge-intensive, the more valuable the product.

Technology executives need to cope with the fact that digital services are replacing digital machines as a key source of revenue. We are consciously collecting quantitative and qualitative data through our senses all the time, once they are processed as facts or numbers, which needs to be stored in “warehouses” for data management or analysis. If we are awake for 16 hours straight in a day, our senses stay active for 57,600 seconds, but we mostly cannot recall when we sense in our eyes, ears, nose and brain the next day because the massive data must be stored in memory.

“A US \$1 investment in digital technologies has led to a US \$20 rise in GDP than US \$3 return for non-technology investments.” This Huawei statement signifies that data and knowledge intensity is becoming more pronounced because they can be used to create diversified revenue streams. Before electronic commerce took place, consumers had to drive to brick-and-mortar stores to purchase storage devices like Apple floppy drives. The business model of Apple floppy drives comes from one-time sales revenue, in addition to recurring revenue from repair services or components replacement due to malfunctions.

Floppy disks were very quickly replaced by Seagate and Western Digital hard disk drives (HDDs), which had larger storage capacity that could manage gigabytes to terabytes than megabytes, but even these were small capacity by today’s standards. HDDs managed to dominate the storage system for quite a while until SanDisk and Kingston took over with small and high-capacity memory drives like memory cards packed with smaller and faster memory chips connected via Universal Serial Bus (USB) to computer devices. As increasingly powerful computers could connect and converse with each other through the Internet, global commerce through the worldwide web enabled vendors to sell their products to anyone on the Internet on electronic commerce websites or third-party marketplaces such as Amazon, eBay, and more. Computer and telecommunications technology accelerated the global market place.

The name Amazon.com symbolize rainforest and rivers in South America that evokes a sense of vastness and diversity, today ranked second in the 2022 Fortune Global 500 list<sup>1</sup> of companies by market capitalization and revenue. It achieved this through its ability to innovate revenue models.

At the beginning, Amazon was simply a straightforward online marketplace that displayed book sellers’ products information, and charged a percentage fee based on item sale price. Having connected to consumers, the product catalogue range expanded and the marketplace model was extended to buyer account plans where buyers can select a monthly “subscription” plan that can access all features and support services, while a “plain-vanilla” free basic plan had limited functionality. Amazon then raised the level of consumer experience with its Prime package that enhanced shopping benefits and free access to entertainment. Thus, Amazon.com converted a physical product sale/agency fee model to a subscription model that increase revenue per customer, which generated US \$22.84 billion in revenue that could cross-subsidize negative operating losses from other revenue segments.

Similarly, Apple went from selling smart-phones to putting in the Apple Appstore that enabled Apple users to access different App services by charging a commission on sales. And then, when Amazon.com, Apple and other tech platforms went from product and services sales into Cloud services, which meant that instead of having to increase memory per device, the platforms earned from selling Cloud memory that could be accessed and scaled on demand.

---

<sup>1</sup> <https://fortune.com/ranking/global500/>

Building computing products is expensive, especially having centralized computing through mainframes. In the 1980s, the Intel 86 series chips became computer “system on chip” (SOC), which enabled smaller servers with bigger power, less energy usage and space required. The interconnectivity of many services enabled the creation of the Cloud. In the 2000s, Amazon Web Services (AWS) emerged as a game-changer that eliminated unnecessary infrastructure costs for tech platforms and computer users. AWS is a cloud computing system that provides databases, servers, storage, and many other applications. This service has become a go-to solution for many corporations looking to scale their internal system without incurring high costs associated with hardware and IT personnel. In AWS model, users are charged only for the resources they use, has become one of the key factors that helped reach 1 million active clients<sup>2</sup>.

The Amazon business model has led many technology companies across different sectors of its business to monetize data. Microsoft Azure, Google Cloud, Apple iCloud, and Huawei Cloud have shifted toward subscription-based business models that prioritize creating value for customers. In 2022, the global revenue generated by cloud services alone surpassed US \$500 billion, and generative AI will be the next major cloud spending area. This is because AI has massive potential in all business areas that can leverage huge amounts of data to automate tasks. Therefore, AI solutions are costly to develop because they consume substantial electricity which can be powered only by smaller and faster chips. With business across sectors seeing greater adoption of digitalization and intelligence, the industrial economy is expected to grow further to US \$13.2 trillion which is 24.3 percent of global GDP than 15.5 percent when the digital economy is worth US \$11.5 trillion in 2016<sup>3</sup>.

The tech business model is changing even as technology enables more inter-connected and more complex systems to evolve. This is where the geopolitical interest comes into play.

---

<sup>2</sup> <https://www.simplilearn.com/tutorials/aws-tutorial/what-is-aws>

<sup>3</sup> [https://www.huawei.com/minisite/gci/en/digital-spillover/files/gci\\_digital\\_spillover.pdf](https://www.huawei.com/minisite/gci/en/digital-spillover/files/gci_digital_spillover.pdf)

## Bibliography

- Cuofano, G. (2023, August 10). *Business*. Retrieved from FourWeekMBA: <https://fourweekmba.com/amazon-revenue-breakdown/>
- Genova, L. (2021, September 29). *Science*. Retrieved from TED Talks: <https://ideas.ted.com/struggling-to-recall-something-you-may-not-have-a-memory-problem-just-an-attention-problem/>
- Gold, J. (2023, July 7). *News*. Retrieved from Annual public cloud revenue reaches half a trillion dollars: <https://www.computerworld.com/article/3701934/annual-public-cloud-revenue-reaches-half-a-trillion-dollars.html>
- Griffith, E. (2022, August 3). *News*. Retrieved from PCMag: <https://www.pcmag.com/news/the-evolution-of-pc-storage-media>
- Huawei. (n.d.). *Minisite*. Retrieved from Huawei: [https://www.huawei.com/minisite/gci/en/digital-spillover/files/gci\\_digital\\_spillover.pdf](https://www.huawei.com/minisite/gci/en/digital-spillover/files/gci_digital_spillover.pdf)