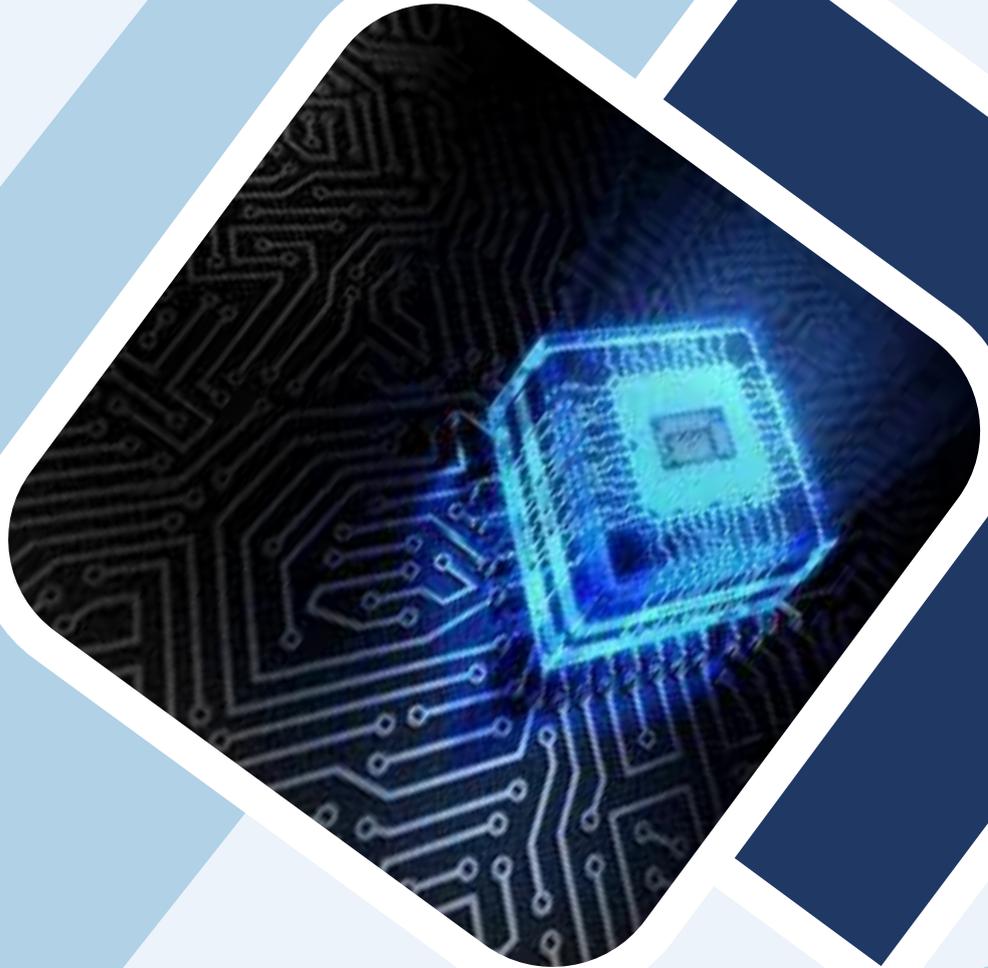


aNumak  
& Company



**Disruption in  
Semiconductor  
Supply Chain**

## Semiconductor Supply Chain



A semiconductor supply chain is complicated to understand. It is the process of taking raw materials and turning them into a finished product. This finished product is a chip that could be used in your TV, phone, or car. The semiconductor supply chain is changeable over time, as new technology and materials are found and replaced with old ones. There are three main sectors for the semiconductor supply chain, research and development, manufacturing, and end-use.

In the first sector, research and development (R&D), is where everything begins. It is the powerhouse of the supply chain. Both pre-competitive and competitive research and studies are conducted on the necessary technologies and at advancing the company.

The second sector consists of five steps, design, fabrication, assembly, testing, and packaging, where the last three are assembled under the acronym “ATP.” The manufacture could be done in-house, where they become Integrated Device Manufacturers.

The third sector involves selling the chips to a retail customer or to an end-user to integrate with a product, like a smartphone or a computer.

## Semiconductor Supply Chain Crisis Before Pandemic



The giant of them all, Intel, was facing problems prior to 2020 and coronavirus. Even though the catalyst was the lockdown, its problems started in 2019, as it tried to become a foundry for different semiconductor companies. While it failed with its mission, the world was struggling with the demands of covid-19, which splurged out a new set of problems for the semiconductors.

After the spread of coronavirus, the use of chips was affected all over the world. The market was depressed, its demands were contracted by 10%. It didn't up to the 6% of the growth that was expected in 2019. But on the other hand, the demand for semiconductors for computers was raised after it was zero before the pandemic.

Aside from all this, with the growing demand for electric vehicles, the crisis could increase more. Germany is facing the worst semiconductor supply shortage for 30 years because of coronavirus, and this has affected 80% of companies in the sector.

This crisis can continue beyond 2022. In 2021, nearly 18 auto plants in America and Europe stopped manufacturing vehicle parts due to lack of supply. This lack has affected large parts of the world like Mexico, Michigan, and Kansas.

# Semiconductor Supply Chain Disruptions



## What Can Disrupt a Supply Chain Otherly?

Many reasons can disrupt a supply chain, starting from poor planning. Additionally, natural disasters like fires and floodings in US and Europe could be another example. Sometimes, shipping may not run smoothly, it may be delayed, like what happened with the ship stuck in the Suez Canal in 2021. Other times, prices may get up or increase, because of inflammation or increased demand, especially during the pandemic, and the price of moving the chips. All of these reasons may lead to a shortage of supplies and materials, which is the main cause of the crisis.

## What Are the Impacts on Industries?

- GM may lose 111,450 vehicle sales.
- GM and Ford have announced stopping manufacturing half-built products until supplies are available again.
- Honda Motor and Nissan Motor will sell 250,00 fewer cars combined.

## What is the Geopolitical Importance of Chips?

The US share of global semiconductor manufacturing has decreased from 37% since 1990 to 12% this year, with no intentions to attract new semiconductors, according to SIA. This may decrease its manufacture by 2%. While China has almost 14% of the manufacturing and Japan has 16% of it.

Other geopolitical factors that play an important role are when the Trump administration started regulating sales of semiconductors to Chinese companies like Huawei. In the same way, American companies were restricted from chips made by China. Chipmakers outside the US were asked by Chinese firms to manufacture chips, which they couldn't take. The rise of 5G is another reason.

## Semiconductor chip shortage could continue up to 2022



Marvell CEO Matt Murphy said that “If it stays business as usual, and everything’s up and to the right, this is going to be a very painful period, including in 2022 for the duration of the year.” he noted that 2022 would be a very painful period and no changes could happen until 2023 or 2024. It is not the view of him only, many other CEO firms are saying that these times are different and difficult. From Murphy’s point of view, he says that something has to give in, and that is the decrease in demand. Murphy states that the slowing of demand could come from computer areas.

This crisis has been on since before the pandemic. Manufacturers cannot blame it all on coronavirus, a strategic shift must be taken or done in the semiconductor supply chain manufacture to see a change in the chips supply crisis. These are difficult times, but they can end well.