



POST-COVID-19,  
REIMAGINING THE GLOBAL VALUE CHAIN

BY AMIT PATEL  
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## POST-COVID-19, REIMAGINING THE GLOBAL VALUE CHAIN

By Amit Patel

### ABSTRACT

The COVID-19 pandemic has created an unprecedented global humanitarian and economic crisis. It has revealed significant vulnerabilities of an interconnected and interdependent global value chain that drives economies around the world. The pandemic has affected global manufacturing and will leave its legacy for years to come. This white paper provides insights on how organizations can reimagine their global value chains and make them more resilient to withstand any future pandemics or economic uncertainties.

*“Failure is the opportunity to begin again more intelligently.”*

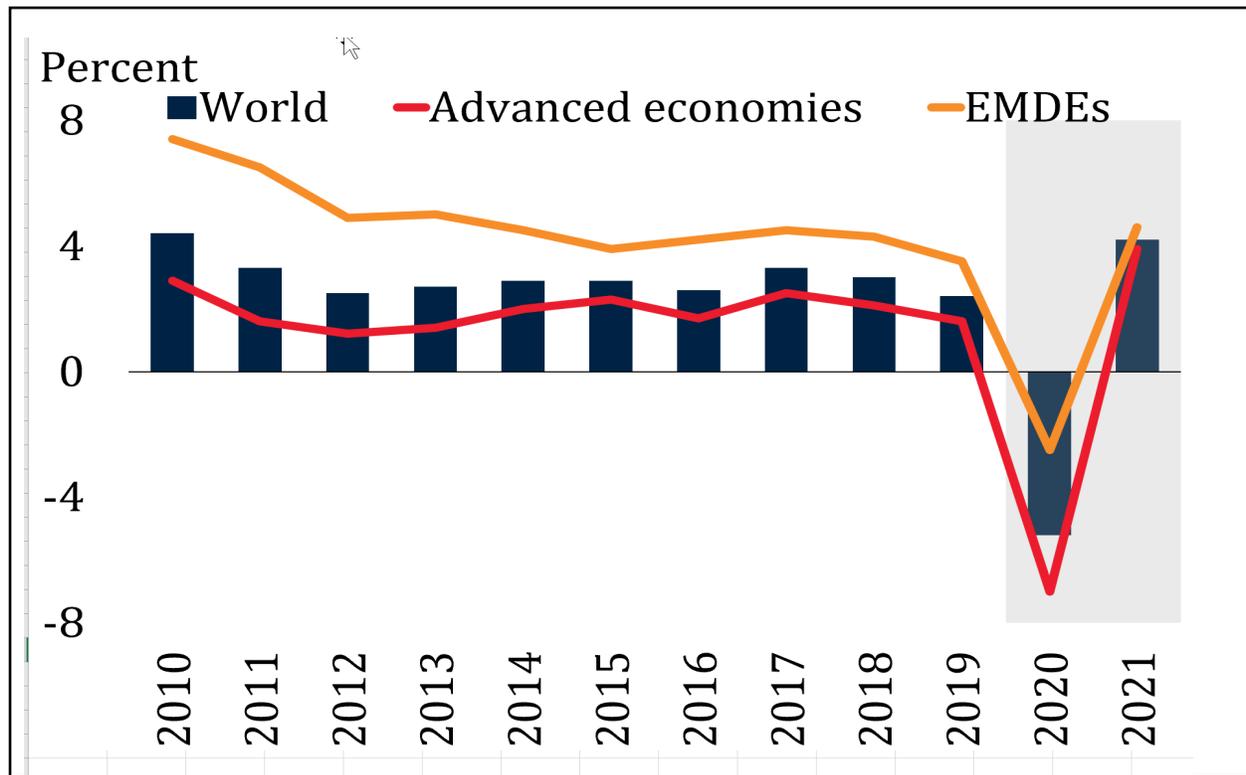
*Henry Ford*



## INTRODUCTION

In addition to creating an unprecedented humanitarian crisis, the COVID-19 pandemic has created a global economic crisis. With advanced economies contracting, China experiencing record-low growth, and the emerging market and developing economies (EMDE) savaged by external and domestic headwinds, the global economy is expected to shrink by 5.2% this year in a baseline forecast. This would be the deepest global recession since World War II, and almost three times as steep as the 2009 global recession.<sup>1</sup> This is illustrated in Figure 1.

**Figure 1, 2020 Global Growth Prospects Look Bleak**



Source: World Bank, June 2020

The COVID-19 pandemic will have a significant and long-lasting impact on globalization and has illuminated the vulnerabilities of the global value chain (GVC). The over-reliance on outsourcing for manufacturing and exports for essential goods has proven to be disastrous. Failure to address these challenges head-on will adversely impact the ability to spark a global economic recovery.

<sup>1</sup> Global Economic Prospectus, World Bank Group, June 2020



## WHAT ARE GVCs?



To better understand GVCs, we must first understand what they are, and the difference between them and supply chains.

A **supply chain** is a link between businesses, resources, and processes that are part of the marketing or distribution of a product so that it gets to the end-user; a supply chain emphasizes the manufacturing and distribution-related steps.

A **value chain** describes the full range of activities that firms engage in to bring a product from its conception to its end use and beyond. This includes design, production, marketing, distribution, and support to the final consumer. Value chain activities may produce goods and services within a single firm in a single geographical location, or be distributed across firms spread over wider areas within a specific region.

A **global value chain (GVC)** is divided among multiple firms and dispersed across geographies. They take a holistic end-to-end perspective of activities, resources, assets, capabilities, relationships, technologies, and financial and operating data. This holistic thinking helps in identifying opportunities that emerge from challenging the status quo.

## HOW HAS COVID-19 IMPACTED GVCs?

GVCs are a globalization enabler. Over the past three decades, GVCs have powered an economic revolution helping poor countries grow faster and lifting many out of poverty. Today, GVCs account for almost 50% of global trade. <sup>2</sup>

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<sup>2</sup> Key Messages, World Development Report [2020](#)

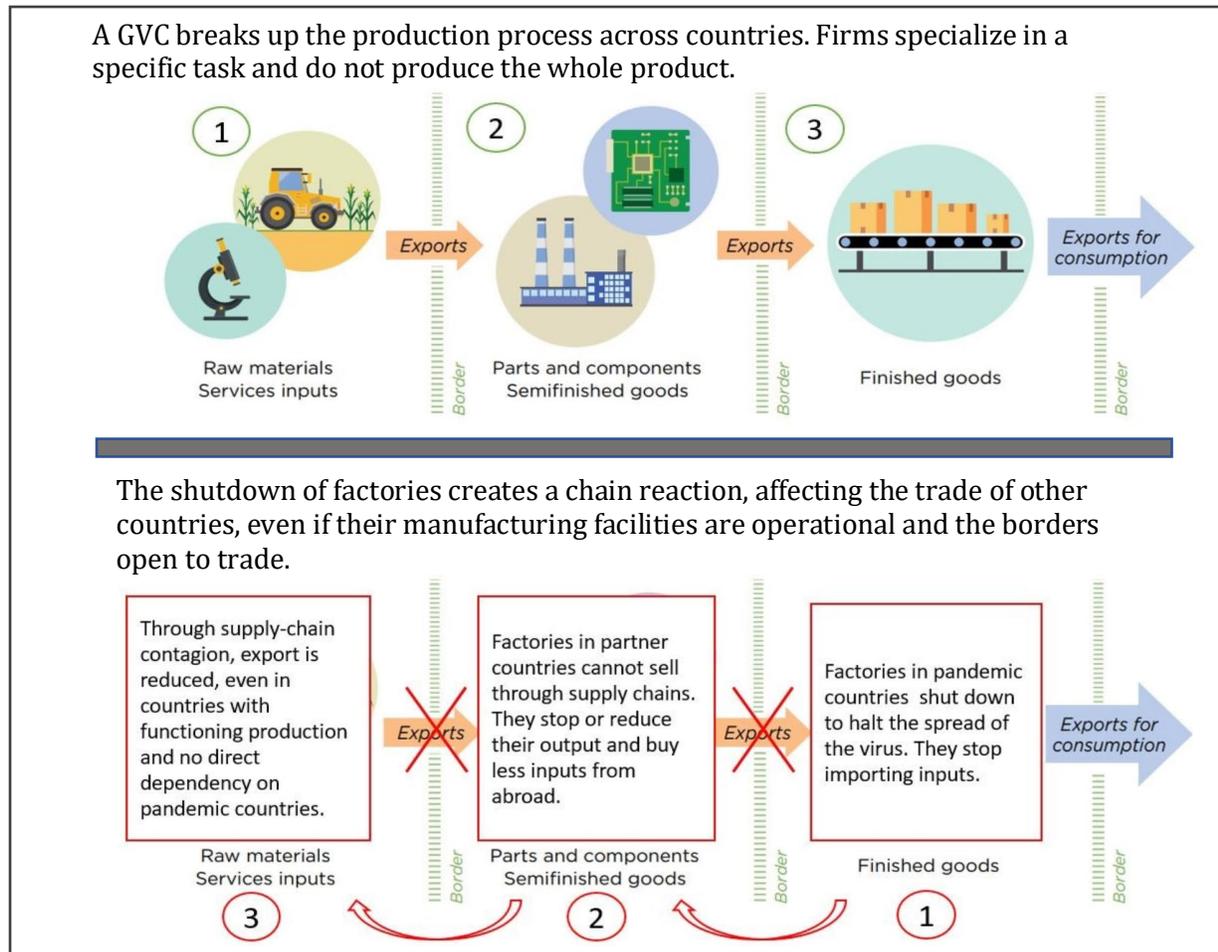


However, the COVID-19 pandemic has illuminated vulnerabilities in the idea of the GVC, which now faces three unprecedented challenges:

- ▶ **Hampered availability** of raw material, intermediate products, and final goods;
- ▶ **Stalled production** of essential goods resulting from factory closures, and labor shortages due to health concerns;
- ▶ **Disruption in transportation** raising concerns for organizations on the supply of essential raw materials and how they operate globally.

These challenges and their associated impacts are conceptually illustrated in Figure 3 below.

**Figure 3, COVID-19's Impact On GVCs**



Source: International Trade Center Blog 05/2020 (Adapted from the World Development Report 2020. Trading for Development in the Age of Global Value Chains. World Bank)

From national lockdowns to closed airspace and borders, the COVID-19 outbreak has resulted in unprecedented disruption to the mechanics of most economies, regardless of their size or stage of development. In particular, the erection of these barriers has placed a major strain on GVCs.

The world has seen and coped with the supply chain crises before created by the SARS, Ebola, and Swine Flu epidemic – but none of these compared to the scale of global humanitarian, economic, social, and political crisis created by the COVID-19 pandemic.



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## EXAMPLE: PHARMACEUTICAL AND MEDICAL SUPPLIES

Pharmaceutical and medical supplies GVCs are struggling to keep up with the demand for essential medical gear such as N95 face masks, protective gowns, hand sanitizers, and ventilators.

In the U.S., there was an acute shortage of medical gear, due to the significant amount of outsourcing and President Trump went so far as to invoke the Defense Production Act (DPA), requiring General Motors (GM) to "accept, perform, and prioritize" federal contracts for ventilators.

As we move towards the post-COVID-19 new normal, the pharmaceutical and medical supplies GVCs will have to be restructured to avoid any future shortages.

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## EXAMPLE: SEMICONDUCTORS AND ELECTRONICS

The semiconductor industry is one of the most specialized, high-value, and globally integrated supply chains. The semiconductor industry is devoted to gaining comparative advantage through the pursuit of efficiency – and in doing so, forsaking resilience.

One of the biggest risks in semiconductor GVCs is the significant concentration of manufacturing in a single country. For example, in 2019, TSMC – a company based in Taiwan, accounted for nearly 50% of the contract chip-making market. Large electronic vendors such as Apple or Huawei rely on TSMC to manufacture chips for their latest generation of smartphones, laptops, and other gadgets.

Another example, is the manufacturing of memory chips, a key component of every smartphone, laptop, or server, being produced by essentially three companies. Samsung and SK Hynix in South Korea and Micron Technology in the US together hold roughly 97 percent of the DRAM world market.

Since there is a significant concentration of chip manufacturing between TSMC, Samsung, SK Hynix or Micron Technology, any slowdown in production means the repercussions are felt not only in the semiconductor industry but in other industries that use the chips. [Gartner's](#) blog post on March 30, 2020, states COVID-19 has wiped off \$55 billion in semiconductor revenue in 2020.



## REIMAGINING GVCs POST-COVID-19

COVID-19 has exposed the vulnerability of GVCs and highlighted an urgent need for an accelerated transformation.

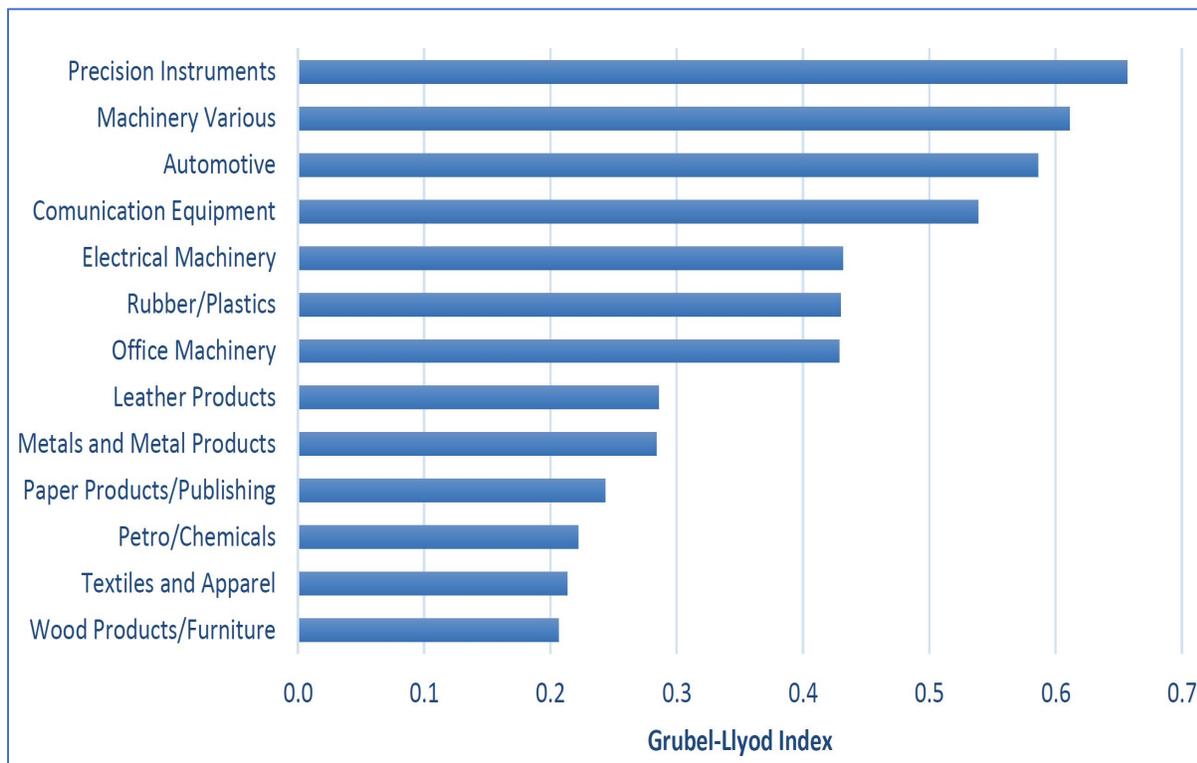
The COVID-19 pandemic offers organizations an opportunity to reimagine and restructure their GVCs for a post-pandemic reality, and we have identified three key routes to help fast-track the transformation of their GVCs:

### 1. Reduce Over-Reliance On China

Since 1990, China gained the maximum advantage from the process of production fragmentation, and attracted investments into manufacturing via GVCs. With China now the central manufacturing hub of many global business operations, a slowdown in Chinese production has repercussions for many industries.

Each country's and industry's integration with the Chinese economy is measured by the Grubel-Lloyd Index (GLI) of intra-industry trade (see figure 4). Simply put, the GLI is used as a proxy for measuring the percentage of a given country's exports in each industry that is vulnerable to supply disruption in China:<sup>3</sup>

**Figure 4, China Integration In GVC, By Sector**



Source: UNCTAD/DITC/INF/2020/1

<sup>3</sup> Global Trade Impact Of the Coronavirus (COVID-19) Epidemic, UNCTAD, March 04, 2020



According to [estimates](#) published by United Nations Conference On Trade And Development (UNCTAD) on March 4, 2020, the slowdown of manufacturing in China due to the COVID-19 outbreak is disrupting world trade and could result in a \$U.S, 50 billion decrease in exports across GVCs. Among the most affected economies are the European Union (\$15.6 billion), United States (\$5.8 billion), Japan (\$5.2 billion), Republic of Korea (\$3.8 billion), Taiwan Province of China (\$2.6 billion), and Vietnam (\$2.3 billion).

**Key Take-Away:** As organizations move towards a post-COVID-19 ‘new normal’, organizations need to focus on reducing their dependency on China for the majority of their raw materials, manufacturing, and finished goods. The new post-pandemic GVCs need built-in resiliency. By balancing sourcing and manufacturing across multiple partners from the GVC network (such as Brazil, India, Philippines, Singapore, to name a few), and incorporating adequate redundancies, organizations will be better equipped to mitigate risks and uncertainties to face future pandemics or global economic crises.

## 2. Re-Shoring

Some of the risks associated with the global supply chain and a highly interconnected world economy first came to light during the 2008 financial crisis, and have only been magnified during the COVID-19 pandemic.

To ensure an uninterrupted domestic supply chain, many organizations worldwide are shifting towards reshoring. Reshoring, or onshoring, refers to the practice of bringing imported goods or material back into domestic production, and may be used to describe a range of activities that occur in numerous industries, not just manufacturing.

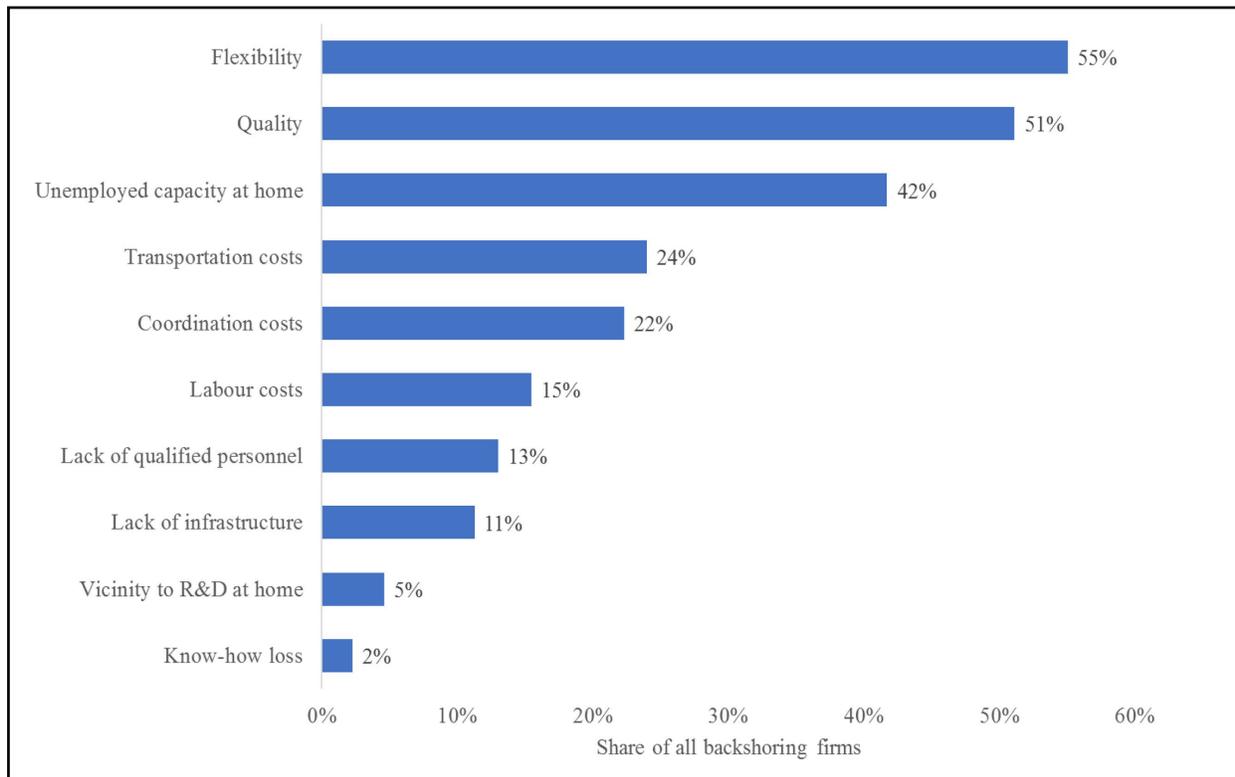
If a certain industry relies on outsourcing, or offshoring, their production, reshoring means allocating the resources necessary to localize that production. This makes organizations less dependent on GVCs to make their goods. For example, at present Apple’s iPhones are designed in the U.S., but assembled in China using specialized components that are manufactured in various countries across the globe. In this instance, reshoring would see Apple would not only design the iPhones in the U.S. but also assemble them domestically.

Even before the coronavirus outbreak in December 2019, many organizations were evaluating reshoring. As far back as 2015, the European Manufacturing Survey (EMS) conducted a field-level survey to identify and validate key drivers for reshoring. This survey involved a sample size of nearly 2,500 manufacturing firms from eight European countries.

The survey concluded that flexibility (55%) and product quality (51%) were the two main drivers for reshoring, see Figure 5. Were this survey repeated today, we would expect value chain resiliency to be a major factor.



**Figure 5, Key Drivers For Reshoring**



*Note: Only firms engaged in reshoring were considered. Multiple answers allowed.*  
*Source: European Manufacturing Survey, 2015*

There are some additional considerations for reshoring.

- ▶ **The “Made-in” Effect:** Customers value the production of various goods in a particular country as a sign of quality. Examples are Italy and France for fashion, Germany for machinery, Japan for electronics, etc. Many consumers also want to support their domestic economies.
- ▶ **Trade barriers:** International trade policies, customs regulations, high import tariffs, fluctuating exchange rates, political trade wars, etc.
- ▶ **Costs:** The higher labor costs can be offset by the lower cost of transportation and increased productivity.

**Key Take-Away:** As we prepare for a post-COVID-19 world, reshoring will be a key consideration, not only to guard against the disruption of a global pandemic, but also to take advantage of the real and perceived benefits illustrated by the EMS research, above.



### 3. Digital Transformation

Until recently, globalization was heralded as the major engine of global economic growth, and central to globalization has been the expansion of GVCs. However, the COVID-19 crisis has fundamentally challenged the logic of globalization. It has brutally exposed the underlying flaws of a system so heavily based on cutting costs. Organizations are now painfully aware that existing supply chains and manufacturing ecosystems are failing.

As we push towards a new normal post-COVID-19, it will be increasingly important for organizations to shift to more agile and adaptable global supply chains that are fully digitally enabled. The coalescing of technologies like 5G, Artificial Intelligence (AI), Big Data Analytics (BDA), Blockchain, Cloud and Edge Computing, Robotics into the Industrial Internet of Things (IIoT) will enable organizations to redesign cost-effective, more efficient, and resilient GVCs capable of withstanding future pandemics and uncertainties.

Digital Transformation means different things to different people in different industry sectors, but here we provide just some examples of technologies that have the potential to transform and strengthen GVCs in the post-pandemic age:

#### Smart Factory

Smart Factory, also known as Intelligent Factory, is the centerpiece of the digitization of an entire manufacturing organization. Through the interconnectedness made possible by the Internet of Things and other cyber-physical systems (CPS), smart factories can efficiently integrate with the rest of the supply chain, thus allowing for real-time process alterations and improvements.

By investing in a smart factory, organizations stand to benefit from:

- ▶ Improved asset tracking and management;
- ▶ More efficient use of resources such as energy, buildings, or material stocks;
- ▶ Increased flexibility to respond to changing customer or market demand;
- ▶ Improved safety;
- ▶ Enhanced sustainability through a smaller environmental footprint.

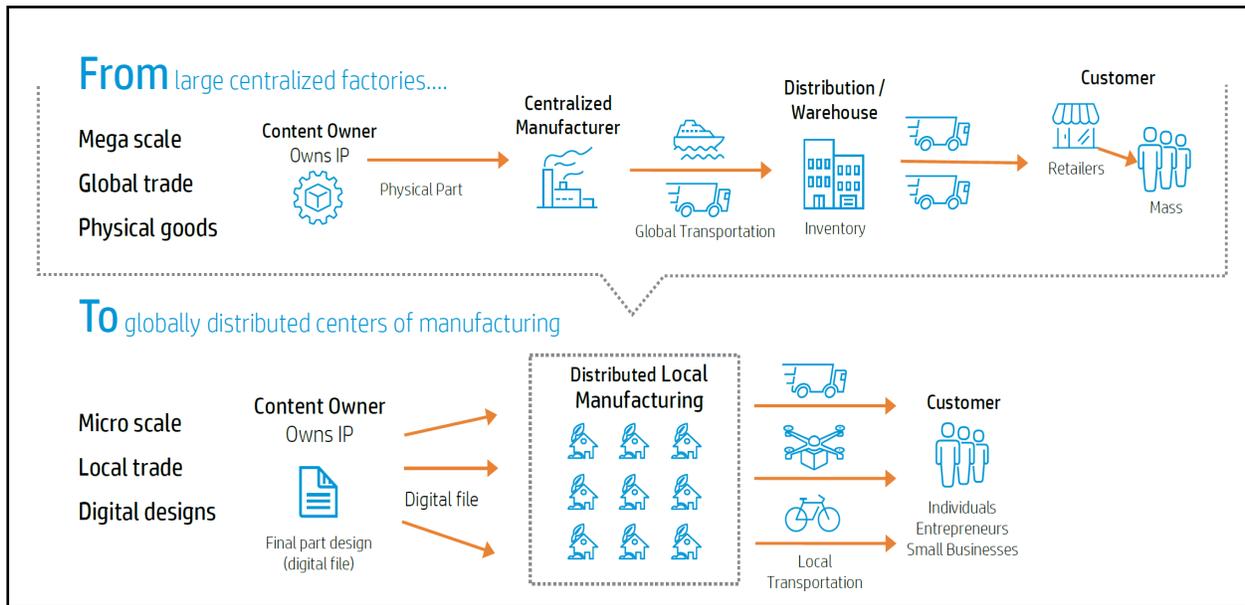
Example: The [European Sting](#) reported Harley-Davidson has experienced incredible improvements since moving to a smart factory. The company reduced its operating costs by \$200 million at one plant alone and saw an efficiency in its production line. The single biggest change is the speed of order fulfillment. *Harley-Davidson moved from a fixed 21-day production schedule for new orders down to only six hours.*

#### 3D Printing

3D printing (3DP) is already leading the way in the digital transformation of many GVCs. With 3D printing, organizations can better connect the physical global supply chain with a digital thread and manage products more efficiently from concept to end-of-life. Manufacturing can be distributed to any location that has digital manufacturing systems in place simply by sending a file. This decentralization enables a more collaborative, transparent, and efficient global supply chain, see Figure 6.



**Figure 6, Distributed Manufacturing Supply Chain**



Source: A. T. Kearney Analysis, 2018

3DP has the potential to fundamentally change today’s complex supply chain, moving manufacturing closer to consumption. By investing in 3DP, organizations will enjoy benefits including but not limited to the ones listed below:

- ▶ Decentralization - taking manufacturing to local markets or the customer much faster;
- ▶ Reducing the barrier to entry in the manufacturing and production of goods;
- ▶ Cost-effective individual customization;
- ▶ Increased go-to-market speed;
- ▶ Inventory reduction.

Example: [3DInsider](#) reported that Ford recently made history when it printed its 500,000th 3D-printed part: an engine cover for the Ford Mustang. According to Ford, a process that can take up to four months and cost up to \$500,000 can be reduced to four days and cost only \$3,000 using a 3D printer.

### Big Data Analytics

The widespread use of digital technologies has led to the emergence of big data analytics (BDA) as a critical business capability to enable organizations to gain a commanding competitive advantage.

Big Data refers to the massive amounts of data collected by organizations using their Enterprise Resource Planning (ERP) and Supply Chain Management (SCM) system, and IIoT enabling technologies. By analyzing this data using statistical methods, organizations create new insights that help improve their end-to-end supply chain decision making, such as the right supply chasing operating models.





Example: Starbucks is using big data and artificial intelligence to improve customer service and boost sales. The coffee giant uses its 25,000 stores worldwide and 90 million weekly transactions to garner customer insights and make decisions to make important business decisions. According to CEO Kevin Johnson, during the 2018 holiday season, Starbucks used the data on a variety of decisions to boost sales. The new customer insights improved its gift card sales by 4% during the holiday period.<sup>4</sup>

**Key Take-Away:** Digital Transformation is not just a buzz word; taken seriously and applied appropriately, it has the potential to shore up GVCs in ways that will benefit every partner.

## SUMMARY

The COVID-19 pandemic has illuminated the vulnerabilities of the existing GVCs. As governments worldwide lift restrictions to slowly open up businesses and the economy, organizations have an opportunity to reimagine and reconstruct their existing GVCs – but they need to address the following key questions:

- ▶ Can existing GVCs be shortened, or even eliminated?
- ▶ What are the alternative value chain design solutions to alleviate fragilities and vulnerable interdependence in global value chains?
- ▶ What are the underlying forces to support the diversification of global value chains?
- ▶ How can unforeseen and large-scale contingencies be better integrated into their GVCs?
- ▶ What are the implications of global value chains' potential shift away from China?
- ▶ How far can global production and value chain processes be flexed without loss of efficiency?

**Reducing over-reliance on China, re-shoring, and digital transformation** are three key building blocks that organizations should leverage in building new, efficient GVCs capable of resiliently handling future pandemics or economic disruptions.

*“When patterns are broken, new worlds will emerge.”*

*Tuli Kupferberg*

<sup>4</sup> Kamilika Some, 'Starbucks Relies On AI Powered Insights To Drive Growth', Analytics Insights. [February 01, 2019](#)





## ABOUT THE AUTHOR

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