ISSUE - 03

MAGAZINE

THE SUPPLY CHAIN STREET

MARCH 2022

"A relentless barrage of "why's" is the best way to prepare your mind to pierce the clouded veil of thinking caused by the status quo. Use it often." ~ Shigeo Shingo

ALLIANCE OF SUPPLY CHAIN PROFESSIONALS IN BANGLADESH

ASCPB

TOWARDS EXCELLENCE

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THE SUPPLY CHAIN STREET

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Preface

Mohammed Zia Uddin

Head of Supply, Reckitt
Bangladesh & Sri Lanka Cluster

I am very happy and honored to announce that the Alliance of Supply Chain Professionals in Bangladesh (ASCPB) is publishing the 3rd volume of their magazine, known as "The Supply Chain Street".

Supply Chain Management (SCM) is vital for any company because companies recognize that their ability to continually regain competitive advantage is less dependent on internal capabilities and more on their ability to look outward to their business partners' networks in search of resources for the right mix of skills. Resonate with their own organization and core product and process strategies.

A supply chain is a network of convenience and distribution options that collects materials, converts these materials into intermediate and finished products, and distributes these finished products to customers.

The supply chain exists in both service and manufacturing companies, although the complexity can vary from industry to industry and from firm to firm.

Since 2017, ASCPB has embarked on a highly exciting mission to promote the advancement of end-to-end supply chain management through knowledge transformation, innovative research, system development and quality enhancement for customers, members, and organizations.

Aiming to build agile supply chain management in the era of Industrial Revolution 4.0, ASCPB is playing a significant role this year by organizing several online trainings on various important topics such as Block Chain, Lean-Six sigma, Demand Planning and S&OP process. etc. I think these training sessions can open new fields to focus on for our professionals.
It is a great pleasure for me that the 3rd volume of The Supply Chain Street Magazine of the Alliance of Supply Chain Professionals in Bangladesh (ASCPB) will be published in March 2022. The last two volume of Supply Chain Street were widely acclaimed by supply chain professionals at all levels in Bangladesh.

I congratulate the entire ASCPB team and wish them every success to continuing their journey towards brilliance.

Message From President

Mohammad Ashraful Islam khan

Head of Supply chain Advisory,
Management Consulting, KPMG Bangladesh

"Be a yardstick of quality. Some people aren't used to an environment where excellence is expected."
~Steve Jobs

"Supply chain." These words can arouse the opposite emotion, depending on your point of view.
From one point of view, supply chains provide significant benefits to consumers because the law of comparative advantage guarantees the availability of cheap goods and services to many. Supply chains also offer unprecedented potential for producers, opening up their markets to a larger population.

From another perspective, the supply chain can hit the economy in a variety of ways. As a result, more jobs may go abroad in the cheap labor market. A contemporary fear is that when these jobs go abroad, the skills associated with these jobs may eventually disappear. Other concerns include supply chain risk and potentially increased complexity because products can now be procured remotely. Delay in collection of these products is also a matter of concern.

To my way of thinking the Alliance of Supply Chain Professionals in Bangladesh (ASCPB) is taking possession of its vision of building a broad platform for the supply chain industry and building professionals. Supply chain management who are out of deep focus on all aspects of the company's development, research and services and who can really help to make their organization effective?

Every day, we provide experiences and opportunities that are unprecedented. You shall read about some of the selected experiences and potential career fields in the supply chain sector to this astonish 3rd edition of "The Supply Chain Street".

It is an honor to work with this wining alliances. I have learned a lot from working with you over the years. Congratulations to all the members and contributors & associates of "The Supply Chain Street" and best wishes for the future.
Thank You

Holcim

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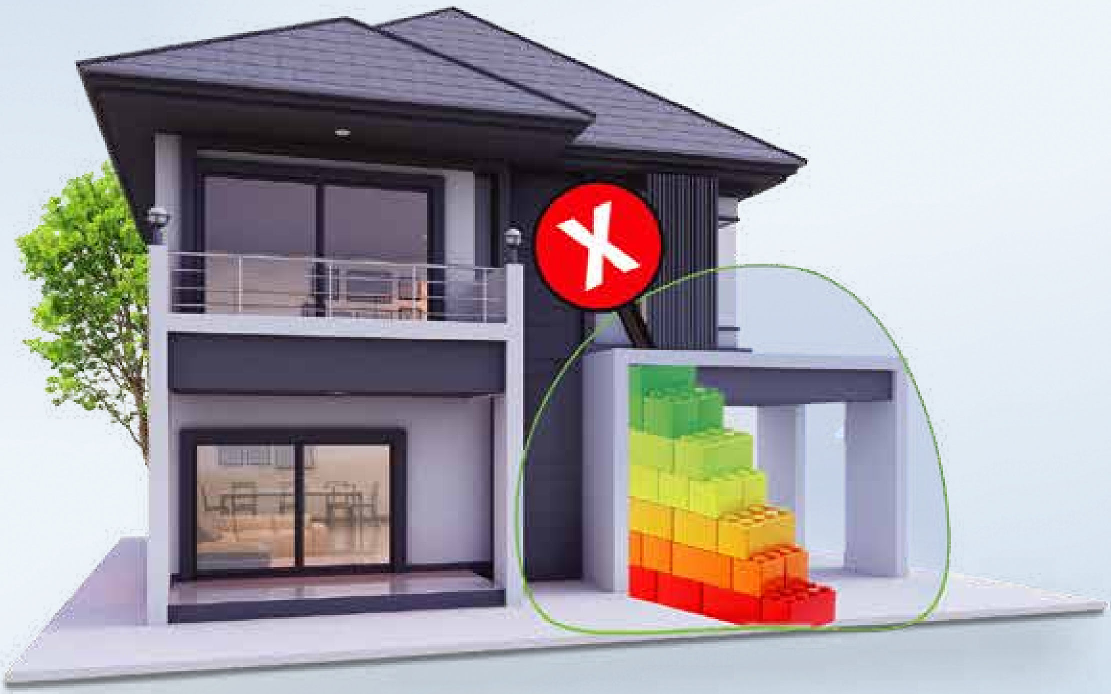

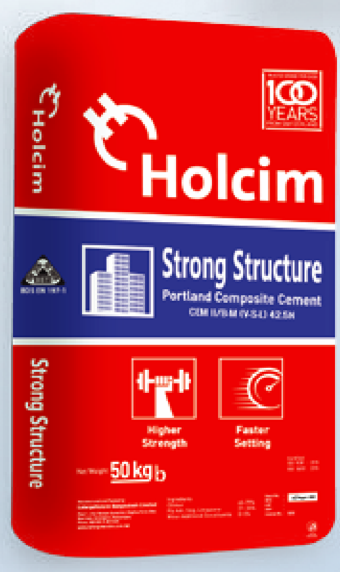

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Finding steel boxes (container) is more difficult than ever

Do you have trouble booking shipment these days? Do you struggle with a lack of available slots and high shipping costs? Almost every company on the world is dealing with the same problem right now. Everyone is blaming COVID-19, but what is the real story? What is the root cause of the problem, and what can you do to manage it?

Remember when suppliers and airlines would compete on pricing and provide discounts to get your business in 2019? Oh, those were the days! Welcome to 2022, where things are in short supply, transportation, and warehousing capacity are limited, and prices for everything (including labor!) are skyrocketing.

Containers are essential equipment for global trade, providing the ability to efficiently handle large volumes of consumer goods, apparel, manufacturing parts, and other materials across today's long supply chains.

The shipping container that has been the building block of global trade growth is turning into the latest source of frustration for importers and exporters coping with worldwide supply-chain disruptions.

Experts note that the reduction in the number of shipping vessels operating as a result of the Covid-19 pandemic has led to fewer empty containers being picked up, leaving many containers in inland depots and stuck at ports for long durations. Long waiting times at key ports such as those in the US due to congestion are also contributing to lengthening the turnaround time for containers. A sustained global economic recovery has added to the impetus for trade. The lack of availability of containers and the faster than expected recovery in international trade has pushed up freight rates significantly over the past year, with some key international routes even seeing an increase in freight rates of over 500 percent compared to September last year.

Why is there a container shortage right now?

The pandemic is the main cause of their disarray. When the initial outbreak of Covid-19 forced China and many of its neighbors into national lockdowns at the end of 2019, the region's massive manufacturing sector shut down. Cargo ships that were already en route out of Asia dropped off hundreds of thousands of containers full of goods in ports across the Americas—but because of pandemic restrictions, they couldn't load those containers back up with new products to send back to Asia. Instead, the containers piled up in ports and inland rail depots.

Lockdown first started early in 2020, then Europe, the US, and then in almost all countries. Travel and transportation restrictions came into effect. Sales drop drastically, and so did global trade. In June, global cargo volumes began to sharply increase; firstly, between Asia-USA, followed by Asia-South America and Asia-Oceania.

By the end of 2020, trade came roaring back. Unable to spend their money on in-person services, consumers dumped their disposable income into buying manufactured goods. Global supply chains sputtered back to life. But now overwhelmed ports—like California's massive Los Angeles/Long Beach port—struggled to load and unload containers fast enough to keep up with the crush of ships waiting just offshore. Many ships, already running behind schedule because of congestion at the ports, decided to leave their empty containers behind rather than wait days to load them back onboard. As containers continued to pile up at major import centers, their supply dwindled at major export hubs.

In response, carriers quickly reinstated capacity in some trades, supporting the large increase in demand. However, as more trade lanes started to recover, the situation became difficult to handle.

To make matters worse, in March a 20,000-container cargo ship called the "Ever Given" lodged itself sideways in the Suez Canal. The six-day blockage further gummed up the circulation of containers and exacerbated the shortage. Brian Sondey—the CEO of Triton, a company that buys shipping containers from manufacturers and leases them to shipping companies—said on an April earnings call that the canal blockage was "the icing on the cake" of a terrible year for supply chains.

Cause and effect:

Reduced number of available containers

-The unprecedented reduction of the world trade in the initial two months of the pandemic disrupted the container's normal flow.

-Containers were suddenly stranded in places with little demand for use resulting in a concentration of containers in undesirable locations.

-At the start of Pandemic, some carriers decided to reduce their container fleet size by returning containers to leasing companies.

-This reduces the number of containers that can be used to transport goods.

-The scarcity of containers in the right locations during the recovery phase had a tremendous effect on rates, which cause increase of thousands of dollars within a short timeframe.

-For example, all export trades from Asia are now affected by overwhelming competition for all equipment types.

-The MLOs that mainly transport goods from Bangladesh are Hapag-Lloyd, Mediterranean Shipping Company (MSC), Hyundai Merchant Marine, CMA CGM, and Maersk Line, but the containers lying idle are those from other companies, like OOCL.

Congestions at the port affecting inland connections

-Many ports were affected by reduced workforce both within the terminals and in support functions such as truck drivers.

-These reductions of workforce resulted in a decrease in port handling capacity and hence a shortage of available terminal capacity.

-Consequently, congestion at numerous ports has severely impacted the schedule reliability to all-time lows as well as the onward transport using inland connections.

-This has caused heavy vessel delays, missed sailings and limitations on volumes that could be loaded.

-According to Chittagong port officials, this has been partly brought on by the excess congestion in many Asian transshipment ports, especially Singapore, Port Klang in Malaysia, and Colombo in Sri Lanka.

-This means containers that took goods for export to foreign countries have yet to return for another shipment.

-As a result, the inland container depots (ICDs) in Bangladesh are failing to transfer the products to the ports due to the acute shortage of containers. This problem has been amplified by delays in getting space on mother vessels in the transshipment ports, said port insiders.

-The officials of several shipping companies said that most of them are unwilling to give bookings for their containers due to an acute space shortage in the mother vessels at transshipment ports and the increase of freighter charges.

Reduced number of operational Vessels

-Similar things to what happened at ports also happened to vessels.

-When the world trade slowed down, some vessels went for refurbishment.

-With fewer vessels in the market, some vessels even had their voyages interrupted due to onboard COVID-19 cases.

-lack of feeder vessels is also evident in Chittagong port. Earlier, feeder vessels loaded with 1,200 containers were available, but now, small feeders carrying 700-800 containers are not easily found, said port officials.

-The schedule for mother vessels is not available. Where previously at least three mother vessel schedules were available, now there is only one.

A changed flow of goods

-Changes in people's buying behavior and the unpredictable development of COVID-19 are causing many irregularities in global trade.

-This significantly increases the cost burdens of carriers. For example, normally, carriers would charter vessels to collect empty containers. But irregular and short terms chartering comes with high costs due to the scarce availability of vessels in the market.

Carrier's reaction

-In reaction to the situation, carriers are looking at all options to increase the turnaround time of their containers such as reducing the detention and demurrage free time periods before and after the shipment.

-Carriers have reinstated capacity, in some cases even to a higher level than the same time last year, but it remains insufficient.

-The demand for space in some trades, particularly Trans-Pacific Eastbound, Ais-Oceania and Asia-LATAM (Latin America), remains overwhelming.

Now that we know what happened, what can we do about it?

Use Premium Products

To provide a more stable level of service, some carriers have implemented premium products, which offer certain advantages, such as priority for equipment availability and space availability. Whilst these services come at a higher price, they are particularly suited for important and more time-sensitive shipments. If timely delivery is essential, consider using premium products, like SPGO, NYSHEX etc. Whilst this may not guarantee something, it will increase chances of securing equipment when it is needed.

Optimize your bookings

Having a lean booking process will help you and the related parties reduce the workload during these times. A lean process allows experts to dedicate more time to your shipments. This can be made possible by booking your shipments at least four weeks before departure; and by advising changes as early as possible.

Focus on your forecasts

Having robust forecasts and plans is helpful, especially in such volatile situations. Find sources for reliable forecasts for significant events, develop alternative routes, and the types of containers to use. Try to be as flexible as possible to increase your options.

Bullwhip effects should be minimized

While it seems we are gaining the upper hand on COVID, there are plenty of other things that could lead to supply chain disruptions in the months ahead. Trade wars, military conflicts, cyber-attacks. natural disasters, and COVID variants, to name a few. We may not be able to prevent the Bullwhip Effect, but there are things we can do to reduce it, and protect ourselves from its effects.

-Share information up and down the supply chain
-Reduce lot sizes throughout the supply chain
-Reduce promotions and pricing volatility
-Simplify everything
-Build resilience, flexibility, and agility

Ironically, none of these are controversial, but they are hard to implement because they require investment, commitment, and trust in our supply chain partners.

Conclusion:

Chinese factories are keeping production in check to keep their new-build prices high. This negates the hope on the cargo-shipper side that the market might be flooded with excess new containers, thereby bringing freight rates down.

Relief from container scarcity is not just about production. Many containers have been held up in port congestion and by issues such as the Ever-Given accident in the Suez Canal. When such logjams clear, more containers will become available.

Eventually, the shipping industry thinks the container shortage will sort itself out. “It is expected that the situation will improve, bottlenecks are expected to be relieved, buying patterns likely to normalize, as well as additional vessels and containers entering the market in 2021, means that the current vessel and container shortage is temporary in nature,” Lars Mikael Jensen, an executive at the freight titan Maersk, told Ship Technology.

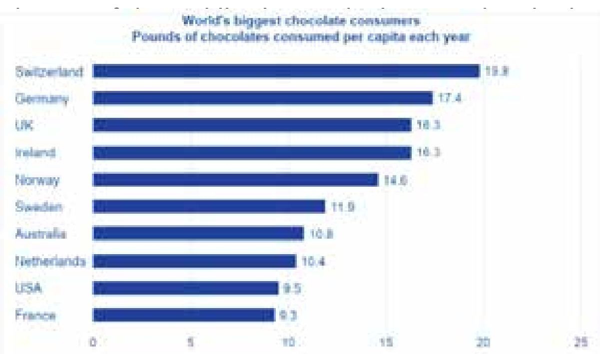
MD Nazmuzzaman Hye

General Manager, Interport Group

Prospects and challenges of Supply chain of Chocolate industry in Bangladesh

Introduction:

In the world of sweets, chocolate is unquestionably a global favorite. More than 3 million tons of cocoa beans are utilized each year to make the confections we see on store shelves. Chocolates are loved by people because it smells good and feels incredible when it melts in our mouths. Eating chocolates releases dopamine which stimulates particular brain regions: the frontal lobe, hippocampus and hypothalamus. Chocolate and chocolate confectionery products are the most consumed foods worldwide. It is a multi-billion dollar worth industry and continuing to grow at a steady rate with new products developed and promoted in the market. The top chocolate manufacturers in the world include Lindt & Sprungli, Guylian, Ferrero Rocher, Godiva and Scharffen Berger



Overview of the Industry:

The biggest chocolate market in the world is Western Europe which made up a third of the global market. The chocolate market is expected to grow from USD 138.5 billion in 2020 to USD 200.4 billion by 2028, at a compound annual growth (CAGR) of 4.8% during the forecast period 2021-2028. Due to large-scale candy production being a relatively new venture in Bangladesh, foreign brands have grabbed a significant portion of the local market. However, local food industry giants like Pran-RFL Group and Olympic Industries are stepping into production and prioritizing exports to local customers. According to "The Business Standard," in 2019, the value of Bangladesh's chocolate and candy market was TK2,000-crore with an annual growth of

12-15 percent.

Analysis of Chocolate Industry in Bangladesh:

In this part of the report, I tried to find the answers to why one should choose to set up production facilities of chocolate Bangladesh in the first place. The framework SWOT analysis has been followed to make this report easily understandable for its readers. Below are the few critical factors in terms of the Strengths and weaknesses of the chocolate industry and the opportunities and threats it faces:

Growing Middle class: Middle-class people have some

discretionary income that they can use to buy consumer durables, enjoy entertainment and vacations, and weather against economic shocks without falling back into poverty. Meeting the demand of the middle class is not an easy job. It is estimated that more than two-thirds of the household consumption expenditure comes from the middle class globally. Let's consider the definition of the middle class, which is people earning between USD 2 and USD 20 per day. We have around 37 to 40 million people – 22 percent of the total population of Bangladesh. The middle-class share in the total population is likely to reach 25 percent by 2025 and 33 percent by 2030.

Women Empowerment: Chocolate does affect women differently than men, says Anthony Auger, an assistant professor of psychology at UW–Madison. Auger, who studies sex differences in the brain, agrees that women have a stronger craving for chocolate. Bangladesh has engaged its large women workforce in the garments industries giving them independence in their spending. The potential of the chocolate industry lies in this demographic segment which represents almost half of the 165 million people in Bangladesh.

A Sweet Loving Nation: Bangladesh is a land of sweets. There are many kinds of sweets (in Bangla called 'misti) in its 64 districts. It is a part of any celebration be it wedding, birthday, exam results, getting a new job, big improvement in any business, birth of a child etc. The culture here is that any good news must be accompanied by a packet of sweets In Bangladesh. Although Bangladesh is not on the list of top chocolate-consuming countries, positivity towards sugar consumption makes the country a perfect place for doing chocolate business.

Cheap Labor: Manufacturing companies are there to make a profit. However, not all companies can maintain their desire to increase profit over time due to the cost involved in production. Labor cost contributes a large portion of production cost. Bangladesh is a densely populated country. Bangladesh's monthly minimum wage level was $48 or around Tk4,070 in 2019 – the lowest among all nations in Asia and the Pacific region, reveals the Global Wage Report 2020–21. By setting up a production facility in Bangladesh, a company gets the chance to produce cheaper and meet the local demand for chocolates and supply worldwide. The very fact happened to the RMG industry and the country is now the third-highest RMG manufacturer in the world.

Weaknesses that needs to be addressed:

Raw Material: The key ingredients to make chocolates are Cocoa, Milk and Sugar and salt. However, the scarcity of Cocoa beans makes it the single most vital component to producing chocolate. About 70 percent of the world's cocoa beans come from four West African countries: Ivory Coast, Ghana, Nigeria and Cameroon. The Ivory Coast and Ghana are the two largest cocoa producers, accounting for more than 50 percent of the world´s cocoa.

Skilled Manpower: There is a shortage of skilled workforce in Bangladesh. Around 36 % of employers in the country face a lack of skilled manpower.

Call for ethical sourcing: Smallholder-dominated commodities face issues far beyond chocolate, irrespective of the cacao supply chain's uniqueness and complexity. As numerous businesses, including sugar, coffee, and chocolate, turn their focus to ethical sourcing,

Below are the few opportunities for the company to explore the chocolate industry in Bangladesh as well as a few threats it faces:

Opportunities:

Emerging Market: Compared with the global chocolate market, Bangladesh doesn't stand out because of its market size of only USD 23.4 million compared to USD 138.5 billion globally. However, Bangladesh is an emerging market for chocolate industries and seems promising by looking at its compound annual growth (CAGR) of 12-15 percent compared to the global growth of 4.8 percent.

Monopolistic Market: Nearly 60 percent of the Tk2,000-crore chocolate and candy market in Bangladesh is dominated by foreign brands such as Cadbury, Kit Kat of Nestle, Snickers of Mars and Ferrero Rocher, according to industry insiders. The presence of these foreign brands is making it difficult for local small-scale producers to grow.

Threats

Unstable Sugar Price: Sugar is an essential ingredient for chocolate making and any movement in sugar price can alter the production price of the chocolate. The National Board of Revenue (NBR) data showed that tax incidence on sugar import is higher than other essential commodities. Sugar importers have to pay fixed duty at Tk 3,000 a tonne, 15 percent VAT, 30 percent regulatory duty and 5.0 percent advance income tax while importing the item. Illegally imported foreign chocolates and candies Geographical location of Bangladesh makes it a perfect place to smuggle goods to and from the country. Chocolates are one of the goods that are brought into the country from the neighboring country India. This activity hurts local chocolate manufacturers in Bangladesh.

Supply Chain of Chocolate Industry

Chocolate does not just flow from a confectioner to shop; it travels a lengthy path, from cocoa pods to bean fermentation and drying, packaging and shipment, and finally the alchemy of real chocolate. Disruption in one stage of the chain can cause a significant delay in delivering chocolate in time and thus missing key business occasions such as Christmas and other national holidays around the globe.

Impact of COVID-19 on global supply chains

The COVID-19 epidemic has altered the economic landscape for many enterprises throughout the world, emphasizing the significance of responding, adapting, and putting up crisis management processes to weather difficult times. Moreover, many other externalities and government actions around the world have begun to impact supply chains, such as the increased risk of trade wars, nationalism and protectionism trends, sustainability concerns, and human rights considerations.

Import challenges from Africa:

Four West African countries produce 70% of the world's cocoa beans: Ivory Coast, Ghana, Nigeria, and Cameroon. The Ivory Coast and Ghana are the world's two largest cocoa producers, producing more than half of the world's cocoa.

Africa is known for its abundance of natural resources. However, the continent is still relatively not economically strong due to its domestic unrest and lack of transparency in the top tier of the government. Port shutdown, military unrest, and open gunfire have affected cocoa production and shipments in the past.

Supply Chain issues in Bangladesh:

Dependency on the Couple of countries for the single most important raw material of chocolate poses a significant threat to chocolate manufacturers around the globe.

Supply chain experts face a problem getting the final product to the end consumer. Chocolates must be kept in temperature-controlled environments at all times to keep their shape. This implies reefer units and quick loading and unloading times at every pier. Leaving chocolates in the yard can cause the entire shipment to be ruined.

In Bangladesh, the lack of temperature-controlled logistics (TCL) infrastructure leads to significant post-harvest losses. According to the UN's Food and Agriculture Organization, fruit post-harvest losses in Bangladesh range from 26% to 50%. In the case of fish, losses typically range from 12 to 30 percent.

The importance of an effective logistic system cannot be ignored as the cost of logistics adds 4.5-48 percent to the overall cost of production and commercial operations. Approximately 98 percent of Bangladesh's

technology and equipment.

Conclusion

As discussed earlier, The Global Chocolate industry is predicted to go up for the next few years. This prediction shows the potential the chocolate industry has for investors. Bangladesh can be considered as one of the attractive countries for setting up businesses due to its political stability and abundance of natural resources. The readymade garments sector boomed when a foreign investor came in the country. The chocolate industry still remains untapped for now as only few companies are currently operating in the market. Despite having several challenges identified in this report, the industry offers more opportunities for new investors in the chocolate industry.

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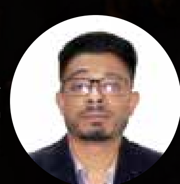


Future of Logistics should be

Global warming and climate change are the biggest concern on this planet. The main cause of climate change is greenhouse gas emissions primarily due to burning of fossil fuel such as coal, oil and gas. Energy, industry, transport, buildings and agriculture are among the main emitters of greenhouse gases. The global transportation sector is a major polluter and in 2020 produced approximately 7.3 billion metric tons of carbon dioxide ($CO2$) as per the statistics. More than 130 countries have now set or are considering a target of reducing emissions to net zero by 2050, about half of emissions cuts must be in place by 2030 to keep warming below 1.5°C. Fossil fuel production must decline by roughly 6 per cent per year between 2020 and 2030.
Green logistics is a BIG tropic now in the supply chain industry and it is today not tomorrow. Green logistics describes all effort to minimize the ecological impact of all logistics activities by implementing more sustainable operations and processes.
Green logistics focuses on a three-dimensional life cycle approach which is "the economy", "society", and "the environment", whereas traditional logistics focus only the Economy.

Is it costly?
Will it be noncompetitive?

Implementing green logistics does not necessarily mean that the level of effort and time and most importantly cost will increase. It helps to reduce its impact on the environment and support positive social behaviors. There may be a return on overall "value for money", rather it will reduce the Total Cost of Ownership (TCO) and Lifecycle Cost in the long run.

It requires transformation of logistics strategies, structures, processes, and systems to become a more effective use of resources which is more towards sustainability. Key drivers of green logistics are Optimization and Digitalization.

Optimization of transportation networks: Use Network Optimization Modeling digital tools to design the best footprint (source) and optimize the transportation network (mode of transport) to move materials flow.

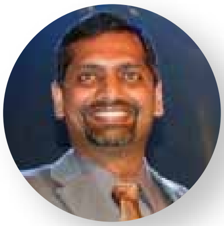
Optimization of routes and loads through better logistics and distribution: use Route Optimizer digital tools to reduce travel distances and fuel use. Maximize backhauling trips partnering with other business/trans porters. To facilitate that fleet should be digitally connected and data should be available with other partners for pre planning.

Vehicle optimization to reduce traditional fuel consumption: Select a suitable vehicle. Big fleet owners should partner with vehicle suppliers to improve their design and weight. High time to move to eco-friendly

vehicles, adopting optimized designs, using electric trucks or operating with natural gas fueled trucks.

What support is needed?
Stable regulatory frameworks are very important to ensuring a level playing field which is a prerequisite for any investment decision by any investor. Infrastructure should be available to drive the new eco-friendly mode of transport. So Government has a vital role to play here to ensure strong regulation and infrastructure to support private sector for green logistics. B2B business clients also should be valued the green logistics initiatives of their transporters and should consider as selection criteria during the sourcing of transport services.

Now it's all a logistician's responsibility to inculcate these three-dimensions in the logistics business from a simpler to very advanced way depending on the size of the business and ensure progressive actions to save the planet. These would be the strategic priority of logistics industry as of today.



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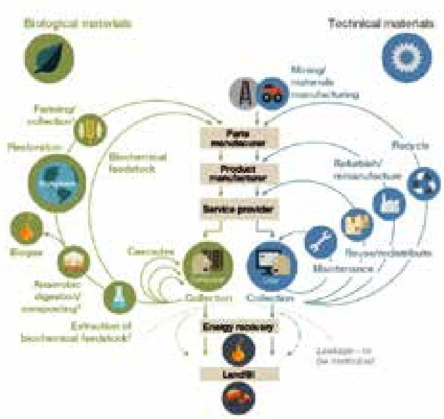
Circular Economy Practices in the Supply Chains: Challenges & Opportunities

The circular economy (CE) as a strategy for reducing environmental pollution and promoting sustainable development has attracted more attention in recent industrial development debates [1]. These talks are mostly driven by policymakers such as the European Commission and industry advocacy organizations. The CE is an approach for an industrial economy in which increased resource productivity is encouraged by the continuous acquisition and reintroduction of waste products after the life cycle of the products [2]. Value chains are classified into two types: The first is a linear value chain, while the second is a closed loop value chain [3]. Materials are procured and then prepared for manufacturing in a linear value chain. Manufacturing waste is generated at the end of the manufacturing process. Figure 1: MacArthur Foundation concept for Circular economy [4]

After manufacturing, products are prepared for distribution via logistical systems and in this process, logistics wastes are generated. Finally, the packaging waste is released throughout the subsequent sales and retail processes. In the end, consumption and usage waste are generated. None of the waste streams are reused or remanufactured in the linear value chain scenario. The CE framework may provide a closed loop



value chain in which all waste is collected properly collected and returned to the remanufacturing plant for reuse. The MacArthur Foundation concept of CE is shown in Figure 1. In developing countries like Bangladesh, the concept of CE is still in its nascent stage due to the presence of several challenges in the supply chain:

1.CE practices need advanced technological framework for waste management.
2.It requires a huge investment to make the supply chain circular.
3.The lack of awareness of CE concepts among industrial managers and consumers.
4.Lack of policies and support from the government and authorities.
5.Lack of adaptability of the new business model towards CE practices

However, there are several opportunities that may give extra fuel to the decision makers of manufacturing industries to give more attention to CE practices. The opportunities can be noted as follows:

1.The CE practices may assist in protecting the environment via better utilization of waste materials.

2.It can help enrich the reputation of the brand and extend its reach in the global market by ensuring environmental compliance.

Natural resources are limited and day by day they are degraded due to industrial activities. Therefore, policymakers and industrial activators should think seriously about how to overcome the mentioned challenges towards implementing CE practices in the supply chain. In the long run, CE practices help improve the sustainability of the supply chain.

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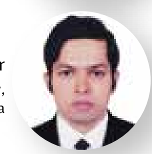


Revealed Finally: How Deep Tier Supplier Financing adds to Corporates' Profits

Banks in Bangladesh like CBL, EBL and NBFIs like IDLC, IPDC, Lanka Bangla have over the last few years launched Supply Chain Finance (SCF) products to finance Suppliers by discounting their Large Corporate approved invoices. We now have other banks like Prime, BRAC, Dhaka Bank and Bank Asia too entering the market. Bangladesh Bank has now also approved a country level platform (www.tredxonline.com) that will allow Suppliers to get access to early payment/financing of their invoices approved by large corporates. These are all welcome actions to making the SME sector stronger through much needed access to unsecured financial access.

Sellers (Tier 2 onwards) deep in supply chains tiers are often desperate for access to cash that are locked for 60-180 days as they wait for payments on approved invoices and often turn to expensive forms of financing to plug their working capital gaps. Deep Tier Supplier finance has the potential to solve this problem.

What is Deep Tier Supplier Finance: The financial product structure and process by which a financial institution finances Tier 2 onwards Suppliers by virtue of the fact that these suppliers are also in the Large Corporate's (Anchor) supply chain.

However, more than 90% of all SMEs are not supplying directly to large corporates and can therefore not get access to such financing options.

Most supply chains have tiers. For example, a readymade garments supply chain tier would probably have the following tiers:

Tier 1: Assembly factories: Cutting, sewing, assembling and packing for shipment.
Tier 2: Subcontracted assembly factories supplying to Tier 1
Tier 3: Processing facilities: Fabric production supplying to Tier 2
Tier 4: Processing facilities: Yarn spinners and fibre processors supplying to Tier 3
Tier 5: Raw material suppliers supplying to Tier 4

The SCF industry globally has been discussing the Deep Tier Supplier Finance issue for years and finally the industry now has the Veefin Deep Tier solution that has solved this problem. Veefin is a global leader in SCF with a very strong presence in Bangladesh, having started on their global journey from Bangladesh itself. They already have numerous banks and large corporates in Bangladesh using the Veefin Supply Chain finance digital platform.

In traditional Tier 1 Supplier financing, Banks finance the Tier 1 supplier upto the value of the invoice approved by the Anchor. This they do, as they are

are assured of the payment of the invoice on its due date by the Anchor. The challenge in Deep Tier that Banks are trying to solve is how they use this invoice approval by the Anchor to provide financing to the Tier 2 and 3 suppliers. The Anchor does not actually pay the Tier 2 or Tier 3 suppliers, so the banks are grappling with how to solve this problem. All the POC solutions in the world are trying to link the components of the Tier 1 invoice, with the Tier 2 invoice and so on – eg – If the Tier 1 invoice consists of Steering wheels, Banks are trying to figure out what component of the Steering wheel was supplied by the Tier 2 supplier, what is the value and thus carve out that value from the Tier 1 invoice and pass it down to Tier 2. The challenges with this approach are:

·Tier 1 suppliers may not be interested in sharing details of their actual purchases from Tier 2 suppliers
·Tier 1 suppliers may not be interested in doing this also because of not sharing their trade and supply chain secrets
·The Tier 1 has separate payment terms with the Anchor and very different with Tier 2 andTier 2 with Tier 3. The existing systems expect common payment terms

The Veefin Deep Tier Supplier Solution solves the problems through the following differentiators

- Provides dynamic credit limit to all suppliers
- The solution works across any number of Tiers
- No need to look at the invoice components. Just an invoice approval is what the system looks at
- The solution takes into account that payment terms across the tiers will be different

The Battle is not between Corporates, but between their entire supply chain down to the last tier

The suppliers across the supply chain are incurring higher costs (than that borne by the large corporate) on account of high interest costs, high input costs as they require longer payment terms as they do not have liquidity.

These high costs borne by the suppliers are anyways added into their selling price and it is the Large Corporate that is paying for all these inefficiencies within their supply chain.

It therefore makes great economic sense for Corporate Procurement and Finance teams to start Deep Tier Supplier finance programs within their supply chains. This will reduce the input costs of the suppliers, which can then be shared between the suppliers and Corporate. Being able to facilitate lower cost unsecured financing for their deep tier suppliers will gain the corporate loyalty of the chain and safeguard supplies in times of scarcity along with adding directly to their bottom lines.

Raja Debnath
ex-IFC Global SCF Specialist;
Director in multiple SCF Fintechs

Interview with Mr. Syed Alamgir

What was your idea for launching Aromatic Halal Soap? Or what kind of preparation did you Make for this revolution?

This was not really a preparation. I had given many products of Aromatic in the market. They did very well. I introduced around 40 products without soap. So, I wanted to release soap products because the other products of Aromatic were doing well in the market. The Idea was to bring a product to the market that gives a good fragrance, scent and outlook.
We offered 100-gram soap with the same price of 90-gram by others. Our offered distributor commission, which was better than that of competition in the market. As a result, they were more inclined to sell our product.
We spent days talking about the wow factor of our soap. Tried to figure, how to differentiate the brand from others. Then we came up with the idea of "Halal Soap". Our soaps were produced from Noodles that were extracted from palm oil, whereas the other products were made from animal fat.
Therefore, we declared it a "Halal Soap" and grabbed the major market share since we are a practicing Muslim nation.

How much importance do you place on innovation in our present context of product marketing? And at what stage is the innovation now in product marketing?

Innovation is a way of life. Our life evolves through innovation. Take an example of the telephone which was invented in 1876. It brought a revolution in communication. Now-a-days it is being replaced by cell phones and the communication is limitless. With the help of the internet, we can have video meetings/calls right away. This evolution is coming through innovation which is the consequence of human need. Innovation is a continuous process.

How do you see the importance of sustainability of business in the food and beverage industry? And what more can be done for better results?

We need to eat as long as we want to live. Therefore, demand for food will always be there. What matters most is how you supply.
For example, we all like to eat fruits. But all fruits are not available for the whole year. There comes the necessity of stored fruit or fruit drinks. For mango, we preserve it through a process and make pulp from it. The pulp is then converted to drink without any artificial additives. It tastes like original juice when you drink it in the off-season.
Next thing, people will want to eat mangoes (chewable) in the off-season. There comes another need which requires innovation in agriculture. This industry is sustainable from a demand perspective. If you can maintain quality then your business will sustain.

From Sustainability two more things came up, Quality and Competition. How important is quality to sustain the competition and how to balance it?

Quality comes first if you want to have a sustainable business. Even if this is a Blue-Ocean for you, you must maintain certain quality as per customer expectation.
Customers are paying for our product and in order to retain the customer, we must ensure quality. Otherwise, they will be diverted to competitors. It is easy for our customers to assess the money they have spent against the value they have just received. If we are able to offer the right value for money, we can have loyal customers. In the present context, the one who has the right quality will lead the competition. Proper combination of 5 p's of marketing (Product, Price, Promotion, Place and People) will bring success.

What are the challenges you see in the Food Industry?

At present, the biggest problems are the copycats. They can easily copy the aesthetic design of your product no matter what their quality is. In addition, they are offering at a cheap rate. Akij family never compromises the quality hence it is not possible to out-run those players by reducing the price.

What does it take to become a CEO? What qualities do you think a CEO can have?

Apart from the regular qualities, one must have high intuition regarding the business. We should hire smarter people than us to run the business. Therefore, seeking advice from your subordinates is another criterion. Also, one must be a quick decision maker. There are so many more required qualities like these which I can't say all at this moment.

If you say your daily routine from the professional viewpoint. How do you manage time to spend time with your family alongside your professional life?

I am a very family-oriented person. They are at the core of my priorities. I am an early riser as well. I try to finish my job by 5 pm and then come back to my home. I have a routine to visit a gym after office.

Work Life Balance or Work Life Integration. What do you think is most important?

I work only for my family. They are the first beneficiary of me being a CEO or a corporate person. Therefore, integrating life with work is very important. Best integration may yield best result. You have to enjoy your work as much as you have to enjoy your family. We just need to maintain proper timing for everything.

After your professional life has come so far. What do you think of standing at this stage when you started or how many major decisions you have made? You wanted to do it differently?

Alhamdulillah my professional career is successful. I got that much more than what I expected. As a Muslim I believe in Allah. So, I think Allah has helped me a lot directly and I'm very much grateful. No regrets.

Nowadays, as we see, the conglomerates have a lot of business integration. And in the middle, they have a centralized office from where they operate. You have a lot of experience in this field, if you tell us a little bit, how can you manage the business of different ventures sitting in the middle of a different group?

All processes are the same. What you need to understand which market you do want & which product is needed to focus on which way. It's like a family. For example, if I have 3 daughters, I will definitely understand how to take care of them. But the thing is that all 3 of them don't need the same thing all the time. It must be understood. It must also be understood that their requirements must be within acceptability.

How do you evaluate the e-commerce concept in our country to expand business?

This is still the initial stage in our country. And this business will take more time to flourish. Mass people still like to go to the market with bags in their hands. When e-commerce will be able to gain faith in terms of product quality and service, then gradually the customers will switch to that mechanism. This market is already big, around 20,000 crore BDT (2.32 Billion USD) and still has huge potential with proper legal compliance.

Where is the gap between infrastructure and human skills? Does it take longer for the e-commerce sector to expand?

Infrastructure and compliance are the main issues. Being such a big market, the government won't leave the tax benefit from here. Our new generation is very much capable of handling such business.

Specifically, I would like to know what were the challenges in the food supply chain in Post Covid? If you, please mention about 2/3 of your Akij initiative.

The world is not the same after COVID-19. Vessel and container crisis evokes the price increase of raw materials. For example, the sugar that we used to buy for 50/55 BDT is now 70 BDT. But it is not easy to adjust this price entirely on the finished goods. Hence the margin is less. We have taken a few initiatives that include increasing productivity, sourcing locally etc.

What are the qualities of a good supply chain manager?

A good supply chain manager needs to know all relevant information well. Must have good negotiation skills. Because the supply chain is a huge area. Nearly 60%-70% expenses of a company are going through the supply chain.

What is the vision of your current role?

Making one of the largest conglomerates in the country, who will supply international standard quality consumer products at an affordable price.

How do you want to see Bangladesh after 5 years?

I am very optimistic about Bangladesh. We will be continuing to grow. Bangladesh's per capita income rose by $327 in fiscal 2020-21 to $2,554. I think our per capita income will reach $5,000 in the next five years inshallah. Because our government mega projects will be completed soon.

If you say something about the young professionals?

If you want to become a good supply chain manager, you must be a good negotiator. Negotiation is not limited to vendors only. It is in our day-to-day life. You negotiate with your vendors, production team, transporters etc. to get optimum results. Competition is huge and availability of information has made it tough. Therefore, you must be well equipped to face any situation. In addition to that, I would like to invite all to become more communicative. This is an area where all of us need to focus on. Good and on time communication can bring better results.

Data Driven Procurement

Data gives you the leverage of procurement daily activities to strategic plan by differentiating the way of action and making competitive advantage for your organization.

To visualize procurement activities from supply market information, from sourcing to pay cycle, to perfectly know the insights of internal & external factors and accordingly act for right decisions taken by supply chain function, Data will be a driver to achieve long-term sustainable value, efficiency improvement and cost reductions for a healthier organization.

What is Data?

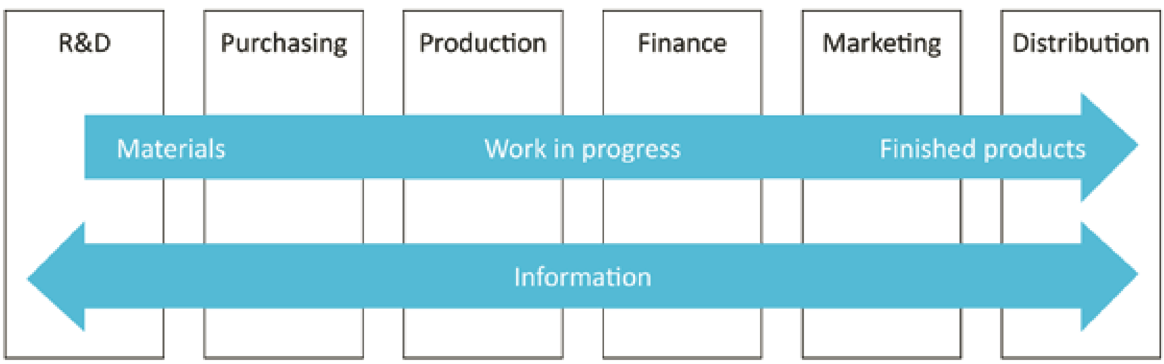
Data are simply units of information and a set of values of qualitative & quantities variables about one or more persons or objects (Source: Data, WIKIPEDIA).

What is Procurement?

'Procurement is... the process undertaken by the organizational unit that, either as a function or as part of an integrated supply chain, is responsible for procuring or assisting users to procure, in the most efficient manner, required supplies at the right time, quality, quantity and price, and the management of suppliers.' (Lyson& Farrington)

Why Data driven procurement is important in the business?

In this currently changing world, we need to adopt Procurement function and have to integrate it with other multiple activities for making this a strong part of Business process flows across an organization:



Adapted from Lysons and Farrington

As per Chartered Institute of Procurement & Supply (CIPS), there are four stages in the development of procurement function:

- Passive
- Independent
- Supportive
- Integrative

So top management needs to focus and prioritize the stage on which they want development. This helps to

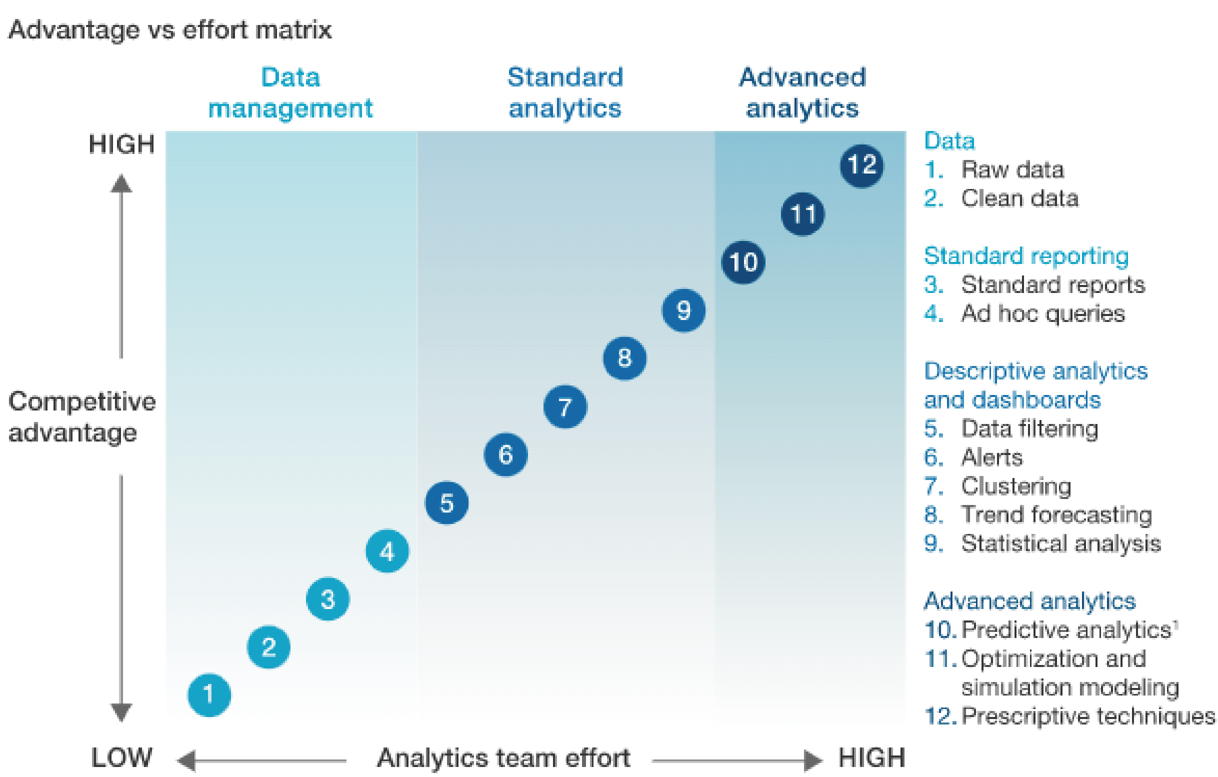
achieve company mission, vision & goal and alignment of procurement function. In addition, Individual procurement managers can perform an ideal role to initiate the data driven procurement within the organization as a pathfinder to make an own identity in the marketplace.
By some benefits of data driven procurement are-

- •Generate new idea & overall Cost Savings
- •Demand-Supply accuracy & efficiency
- •Vendor & Stakeholder Management
- •Digital engagement for transparency & team empowerment
- •Compliance & Visibility

more value from purchase data-for better negotiation tactics, vendor management, and purchasing strategy, (Source: McKinsey & Company, March 23, 2017)". And I believe available resources like Microsoft Excel is also a great tool for giving us expected outcomes based on inputs.

For data driven procurement, Procurement Managers or Buyers do not need the expertise of data scientist but they can perform by understanding of inputs & outputs of defined analytical models. Functions need to access the historical data, able to run the analysis and use the outcomes for further decisions.

Companies can create an analytics strategy that generates value.



[1]Includes machine learning (supervised and unsupervised), artificial intelligence, and deep learning.

McKinsey&Company

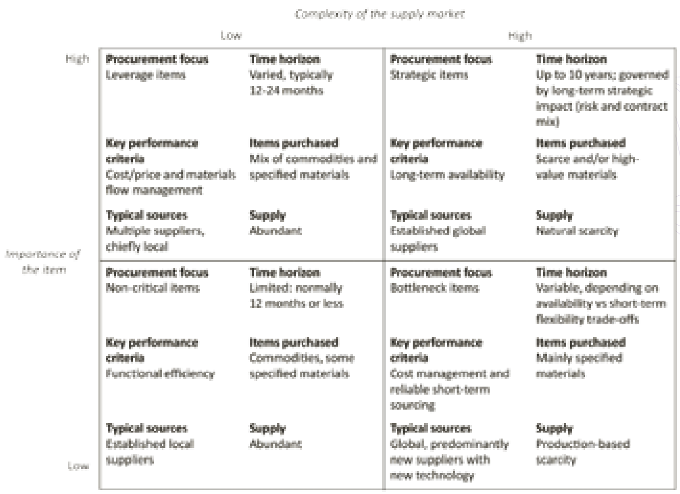
How it works?

There are lots of methodologies to implement in works like- Statistical models, Advanced Analytical skills (including AI facility) will help us to adopt and implement desired results. "Advanced analytical wrings

Some operational examples, case studies, general ideas to all level leaders for thinking differently about their own task and make differentiate from the traditional works:

Category Analysis:
For procurement function, managers need to know own category spending, Price movements, Market data, Top Vendors including ABC analysis, Critical Items or Services etc. By data driven procurement, procurement functions can get it very easily. For example; By Pareto principle as 80/20 rule with many more ways, Procurement functions can easily do the ABC analysis and set the business strategy where he need to focus, can increase bargaining power during negotiation with related vendors and optimize the inventory categorization

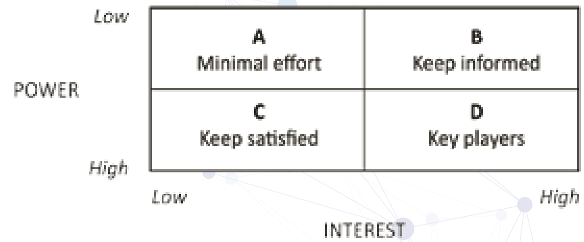
Negotiation:
For Procurement steps, TCO (Total cost of ownership), Life time cost etc are also an integral part of data driven procurement and highlighted point here, to know your counter parts including biography, social & personal data may help you in the negotiation table.



Example 1: Mr. Sun, Procurement manager has received a purchase requisition from users for procuring a Bus. Mr. Sun issued the RFQ to prospective OEM (Original Equipment Manufacturer) and during comparative studies on received offers, commercially Vendor X was L1 but L3 on Technical evaluations and Vendor Y was L2 on commercial part who became L1 in Technical evaluations. For justifying the awardee as value for money, he started to analyse further data from market, previous history, and specifications as per scope etc. One outcomes only from his data analyse, Vendor X & Y both have used Korean Tyre in their offered Bus but

•Vendor Y used M Brand tyre for this offered Bus, Millage 50,000+ KM on an average and Per KM cost 0.50 BDT (Awardee)
•Vendor X used N Brand tyre for this offered Bus, Millage 30,000+ KM on an average and Per KM cost 0.70 BDT (Non Awardee)

Example 2: Ms. Moon has assigned by functions to further negotiate the warehouse rent where the owner



wants 50% hike from existing, during multiple negotiations or asked to implement the exist clause of the contract. Strategically the location was very effective for her organization but could not bear such non reasonable increments. After assigning the task, Ms. Moon has analysed the Power & Interest matrix for this stakeholders and started to collect the contract history, market data in same area etc including vendor Biography, interest, psychology, social status. Negotiation achievements, 11% cost increased only looks fair after revision the contract in two years interval.

Mendelow's power/interest matrix

Case Study 1: For a certain fixed route & defined scope, Afreen Shoes Company Limited has a service contract with the service provider name M/S Karim & Sons for employee pool car from Location A to Plant B. In this contract, rate was including Rent, Allowances, and Fuel & Toll as a fixed per month considering approx. running KM and other consideration. During COVID 19 pandemic situations, company management has decided to review each contract and Zero Based costing for survival. In that situation, Responsible procurement lead has extracted all previous historical data and start to analyse the spend trends in each month, Log sheet data, review cost components and contract terms. By data analyse, he found two major points, primarily; "From 2013, this service is continuing without any review and same rate" secondarily "In the last contract, Fuel was included in the rent as a Packages as per Approx. KM and full month days consideration". Then he decided to go with new tender by splitting the rent as fixed cost and Fuel, Driver allowance etc as variable cost based on actual running KM born by the company and toll cost in both ways as per actual working days. Result was 7% cost reduction from existing spends, simplify the contract and some other financial benefits.

Sustainable Strategy on the business: For business strategy plan and making it sustainable to achieve the business goal, data may help you;
Case Study 1: Bangladesh Food Manufacturing Company (BFMC) has an own warehouse at Khulna city to serve the nearby market. Operating cost was too high, approx. BDT 13/Pack whereas other rented business hub around the country, approx. cost was BDT 7-8/Pack. Management of BFMC has set a business strategy to divest it to manage the debt. When procurement functions involved in the process, Procurement lead has shared a sustainable strategic solutions as Third Party Logistics (3PL) for this WH instead of divest. Top management has agreed and plan for Open bidding to International & Local service providers. Based on business Scope, Procurement has started to extract some more data including Fixed & Variable cost components, identify must do items with challenge sessions, mapping the manpower and set the Operation Model from As it is conditions to new model, agree for the objective, prepare cost model for open book costing, set the negotiation strategy and find the assumptions, make options for negotiations and implement the project. Project success stories from overall data analysis, 40% cost reduction from own operations to new 3PL operations and make a successful contract in BDT 8/Pack without compromising the scope.

Business Process Improvement: Data analysis can gives us leverage for improving existing process and help to evaluate the KPIs as defined. e.g.: If business want to improve the Procurement to Pay (P2P) cycle then initially gather the data for as it is condition in current days from purchase orders historical data, ERP can help to segregate. Then identify the day wise aging, arrange challenge sessions with Management to buyers and Buyers to Users, prioritize the PRs based on value vs. importance, accordingly issues the POs as fast truck project and monitor daily basis.

Is it important for every transaction or business?

Advanced analytical era has already started. We need to cope up with this and enhance our knowledge to adopt the new technology, methods and open to receive the changes. But same level data analysis is not mandatory or not feasible for every transaction. We need to identify the business criticality, risk factors, value, importance etc. The below matrix can help us:
The Kraljic portfolio matrix

Data Segregation & Challenges to implement

GIGO (garbage in, garbage out) is a concept common to computer science and mathematics: the quality of output is determined by the quality of the input. So before implementing the data driven culture, we need to ask ourselves:

- What we want to achieve?
- What data we really need?
- How we collect it?
- Which process we securely keep it?
- How we implement to get leverage?

Organization has generated lot of data in every transactions and typical organizations stored every line items. In some cases, they don't know which, when & how the data is required or implement. Data is a pathway for future. So we need to segregate the big data for transforming, store it accurately and utilize it properly for taking decisions.
It is not a one time Job but considered as a continuous improvement journey. It's also not a job for Procurement to implement, other functions like Finance, IT, User departments are an integral part to implement the culture. Data can be a gold mine for overall business if we are able to know which data is important, maintain the database, capture & utilize in right time in right manners and monitor it. Here I've tried to give some basic information's to highlight the importance of Data Driven Procurement process to inbuilt our mind-set. After adapting the basics, advanced technology like AI, Robotic Process Automation (RPA) etc. will help us to get more value from procurement data to shift the functions as reactive to proactive. Data is a main fuel to enter the next generation digital procurement.

Md. Mazharul Huda LIZAN
Senior Manager - Procurement, LafargeHolcim Bangladesh

Managing Supply Chain Projects in the New Normal

Project management aims to apply different strategies, skills, knowledge, and resources to reach a time-bound goal. Although this discipline has been prevalent for decades, the rapid evolution of fast-paced societal, environmental, economic, and technological changes calls for a change in best practices in the overall art of managing supply chain projects.

A developed, thorough project management plan makes for a greater project and organisational success, yet just 46% of businesses prioritise project management within their cultures, according to the Project Management Institute (PMI). Exploring the recent global trends and understanding the impacts can us help identify the gaps and incorporate the necessary changes into our business processes.

One of the most drastic adjustments has been adapting to the new normal due to Covid-19. There is a higher rate of employees working virtually from home, remote, part-time, full-time and on-contract, meaning management style calls for an adjustment of internal processes to oversee the diverse working conditions within the same department.

The advantage is that it allows companies to recruit employees globally, widens the reach for niche skills where needed and increases flexibility in traditional workplace practices, but it also requires considering new ways to track employee accountability, different time zones and laws depending on their location. This trend is likely to continue even when the pandemic subsides, which will present unique challenges and call for updated work-from-home policies, favouring digital communication instead of traditional face-to-face interactions.

On top of the unprecedented shift in virtual management, the biggest impact in the supply chain process comes from the rise of technological advancement. This trend was always on the rise, but the recent years have seen a boom in the demand for automation and technology. The growing popularity of Artificial Intelligence (AI), Internet of Things (IoT), machine learning, robotics, and cloud services demand massive integrations in the supply chain project management. Some of the issues include higher costs of human labour, inconsistent availability, and human errors.

Machine Learning in supply chains means organisations will not need to store as much inventory because the flow of products will be optimised. IoT makes warehouses smarter and there is bound to be some overlap in function with employees.
An example of a company that successfully integrated automation in the supply chain on a large scale is Amazon. Amazon warehouses still have a sizeable human labour, but the additional automation cut down costs and completely redefined warehouse efficiency and customer convenience. Human errors are reduced, productivity is increased, higher availability is ensured, reliability is increased, and performance is optimised.

According to HelpSystems, there are various benefits to automation as shown below:

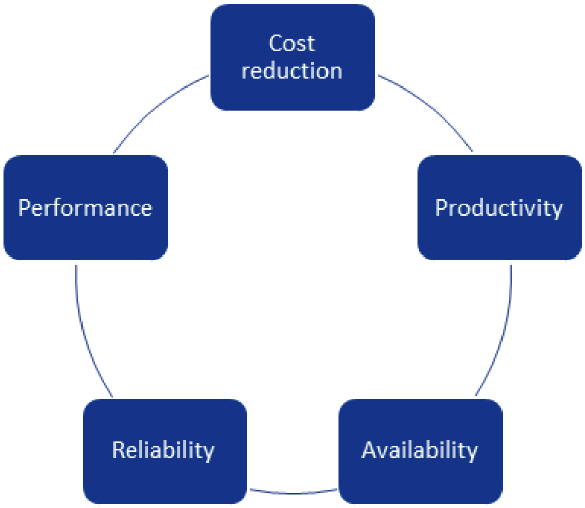


Figure 1: Principal benefits of Automation

There are personal issues that surface as the reality of automation takes over since employees view it as a threat to their livelihood. Not addressing these concerns from employees or having a strategy to tackle these fears ensures failure at implementing the necessary changes. Companies don't want a reputation of firing their employees, so instead of getting rid of the jobs in jeopardy that are being replaced, their employment can be preserved by training them for other roles, modifying what these employees do for the company. When old positions are no longer needed, new skills can be picked up and more responsibilities can be given to them to maximise the existing talent. This way costs are still cut down, but human resources are reallocated.

Despite the concerns regarding automation replacing jobs, robotics is unlikely to take over certain processes in the supply chain and there is untapped potential and increased efficiency that comes along with it and can aid achieving strategic goals at a rate that has never been possible by humans. Whether allowing supply chain teams to improve or add to their current processes in some way or another, newly created tools and technology are all but necessary for survival as we move into 2022 and beyond.

Digital supply chains provide digital environments for managers to get real-time feedback from physical supply chains. One impact of AI will possibly be the automation of many administration-focused tasks that are primarily project managers' responsibility currently, including resource allocation, project balancing, and scheduling and budgeting updates. Another example might include the automation of resource allocation—a task that has long included varying amounts of automation, according to a study by Northeastern University.

Regarding inventory management trends of supply chains, areas of improvement include diversification of supplier, cloud-based technology, and an increased focus on e-commerce. Profit margins can be increased by diversifying the supply chain with both international and domestic suppliers since there will be cheaper options and quicker shipping times. When Covid-19 disrupted international trade, supply chain managers were left scrambling for alternative ways to meet demands. Since border restrictions could be imposed anytime without prior notice amidst a global pandemic, diversifying domestic options is an effective way to mitigate the adverse effects of supply chain distribution.

Since connectivity and easy flow of information can prove to be a challenge in the digital shift, cloud-based technology provides the added benefit of accessibility from any location, especially since the pandemic, more people are working remotely than ever. Since information is stored and delivered digitally, data can be tracked and exchanged throughout the entire supply chain quickly and easily all over the world, keeping business connected and cutting time and cost without having to invest in a costly infrastructure upgrade. The only constant is change. Companies go through many organisational changes over the course of a year, both internal and external, including workplace practices, leadership style changes, and many more. To keep up with the changes and communicate those changes from the top down or vice versa, supply chain project managers need to incorporate change management as a part of the overarching project plan, outlining the steps and protocols that the team needs to follow.

Management style needs to keep up with the pace of societal changes and account for diversity in the workplace. Teams of tomorrow will have increasingly varied types of workers, potentially complicating administrative operations, day to day communications and team dynamics. Teams will create a broad range of issues for project teams to cope with, as they strive to collaborate effectively and efficiently.

Another trend to account for in management is ESG i.e., environment, social and governance. With younger employees entering the workforce, there is an added emphasis on a greener workplace, ultimately demanding corporations to become more socially responsible, carrying out projects that support the greater good. The trend includes increased transparency, investment in greener technologies and other sustainable business practices. ESG activities have proven to garner higher level of interest from prospective employers as well.

One aspect often overlooked is the emphasis on soft skills, even though there are measurable rates of employee satisfaction and employee retention as a result when well-implemented. Having an effective collection of "soft skills" can be as important as having the hard skills that are typically associated with the discipline. Project managers need a certain level of analytical and organisational skills in to be successful, but at the centre of their work lies an understanding of people and how to manage them in a way that will yield the best results. Communication is key to any interpersonal relationship. A successful project requires project goals to be communicated clearly with team members so that there is guidance on where everyone stands with their responsibilities. Best practices also include actions a supply chain manager must avoid doing. Certain tendencies like micromanaging may give a false sense of control, but it rarely succeeds in garnering results because this approach instigates a sense of dissatisfaction in small tasks and discourage innovation and creativity. On top of discouraging micromanagement, team morale can be further boosted by empowering employees to take charge more and earn their autonomy through freedom of creative expression.

Despite the awareness, many developing nations, like Bangladesh, are seeing a gap in the demand for digital adaptation and the supply of workers with the necessary technical proficiency and skills. Periodic assessments and redesigns are needed to manage risks and plan for how the company will handle major disruptions so the operation can recover without wasting unnecessary time. The changes need to be communicated accordingly to the employees involved. There is also a resistance to cultural change brought upon by these digital trends from the executive level and individual employees which pose a threat to the growth of organisational process.

According to Supply Chain Brief, some of the most common culprits of poor supply chain performance in Bangladesh include poor data quality, lack of resources and training, lack of metrics & accountability, poor communication, and collaborative skills with trading partners. Global supply chain is reaching a critical point of growth and supply chains only work efficiently when a healthy global network is maintained, where Bangladesh is lagging. Movement of products is slow and there are also issues in supply of inferior quality, delayed supply, and unwarranted cost escalation. As a result, Bangladesh is often overlooked globally in terms of potential. According to Marine Traffic data, vessels are at the port for three days before any measurable action is taken regarding them. This weakens an already fragile system, urging prioritisation of efficiency.

Stability is often celebrated. Change, however, threatens to disrupt the current business and has the potential to lead to disaster. As a result of this uncertainty, organisations stick to familiar practices, even when it seems irrational to do so, according to Forbes. It is a good idea to expect some resistance and plan for it instead of underestimating employees' comfort of the familiar. There are ways to make the transition easier, for example, aligning the change in a direction that coincides with the organisational values. Fear of the unfamiliar is a threat to change, so when the unknown reasons behind a change are explained with expected measurable results, it makes it easier to accept. Providing a support system through change management plans, will therefore provide a comfortable environment for the transition. Finally, as a project manager, it is important to provide effective training to assist the transition and possibly hire employees who are solution-oriented and can aid in the necessary process. Senior supply management should exercise adding their creative vision to the supply chain and be committed to incorporate logistical effectiveness.

Organisations are now starting to see supply chain management as more than just a tangible and mechanical part of the overall process. Supply chains are being recognised as an integral part of the process that incorporates data, information, distribution, and knowledge-flow. Therefore, it is time for developing nations like Bangladesh to step up the game and fix the self-imposed obstacles, like resistance to change and digitising, to gain more credibility and visibility, and keep up with the global trends in the art of managing supply chain projects.

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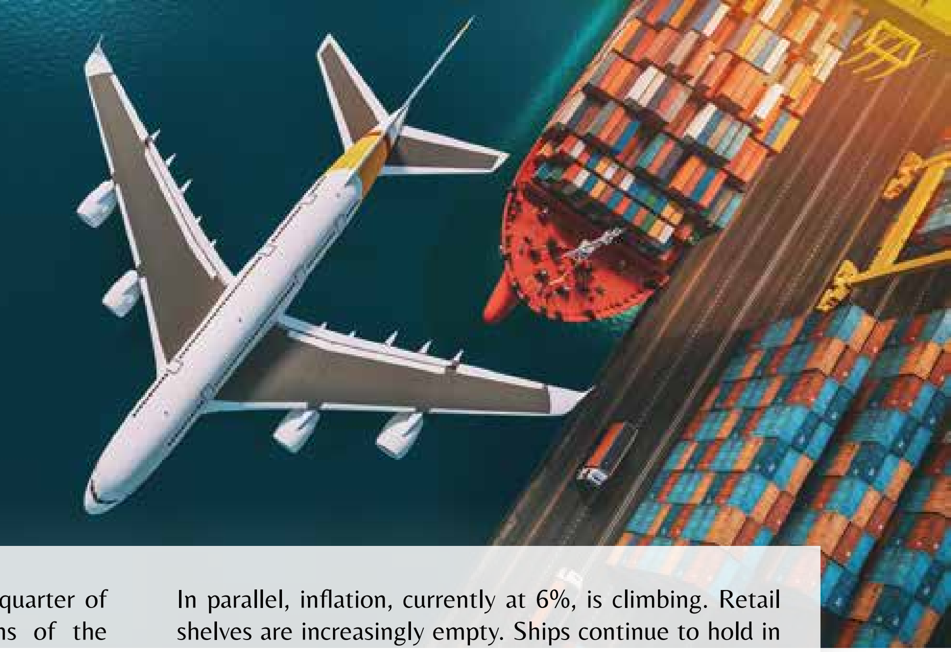
When The Chickens Come Home To Roost



Today, we are nearing the end of the fourth quarter of corporate reporting. Self-reported projections of the ocean carriers forecast that the industry is posting over $200B in profits. Let me repeat this, "$200 Billion in profits."

This massive positive windfall is double the profit made by carriers over the past 20 years combined. Yes, a single year offsets twenty years of poor margins for a struggling industry. Maersk, the world's largest container shipping company, reported its best quarter in 117 years, posting a $5.9B profit for Q3 on $16.6B in sales.

None of this windfall will line the pockets of the truck drivers, fix the chassis issues, or streamline port operations. The top fifteen ocean carriers are owned by non-US international conglomerates dominated by Chinese, Danish, French, Korean, and Middle East interests.

In parallel, inflation, currently at 6%, is climbing. Retail shelves are increasingly empty. Ships continue to hold in the west coast harbors of LA and Long Beach, and the west coast warehouses are full. Inventories in the chemical industry are at record lows: a forerunner of bad days ahead. (The health of all sectors is dependent on the chemical industry.) Hazardous freight is the most likely to get "rolled" at the dock. (Sitting waiting for a confirmed booking.) While we will recover quickly in retail (moving from painful shortages to a glut of inventory), the chemical industry–sitting four and five layers back in the supply chain–takes longer to recover. My take? The value chain supporting all industries is sick, requiring a leadership step-change.

Time For Action

For business leaders, the chickens are coming to roost. On the one hand, we should celebrate the fact that the aggregate industry moved 38% more freight in 2021

DAYS OF INVENTORY

Industry	3/31/2019	6/30/2019	9/30/2019	12/31/2019	3/31/2020	6/30/2020	9/30/2020	12/31/2020	3/31/2021	6/30/2021	Increase
Technology - B2B	71	73	72	61	74	73	72	58	62	140	69
Aerospace and Defense	104	106	117	92	132	159	149	112	137	126	22
Apparel Manufacturers	106	131	120	116	137	231	138	118	123	120	14
Retail Food	0	0	15	28	0	0	0	0	0	8	8
Retail Apparel	68	75	76	80	69	111	88	77	69	76	8
Non-Durable Households	65	65	64	61	65	63	58	58	68	69	4
Oil & Gas	25	27	28	27	24	33	29	60	28	28	2
Automotive Parts	75	77	76	79	81	101	74	74	72	77	2
Restaurants	10	10	10	10	10	13	12	11	11	10	0
Medical Device	120	119	123	115	129	143	130	116	124	119	0
Food	48	49	50	47	46	47	48	46	49	47	0
Containers and Packaging	52	52	54	55	56	59	53	52	53	52	0
Beverage	56	59	59	56	59	60	56	54	57	55	-1
Retail Drug	58	56	57	62	55	65	62	60	57	56	-2
Retail Broadline	75	88	83	91	72	92	79	81	64	73	-2
Retail E-Commerce	10	10	9	7	8	7	7	6	7	7	-3
Technology - Telecommunications	58	58	60	52	58	57	55	53	57	55	-3
Personal Products	120	106	116	113	138	168	115	105	117	117	-3
Furniture	56	57	56	56	55	65	56	52	51	52	-4
Automotive	55	56	56	54	62	85	56	50	50	51	-4
Tires	50	50	49	49	58	64	44	40	44	46	-4
Trucks and Heavy Equipment	100	100	104	99	110	126	113	96	98	95	-5
Diversified Industries	82	81	78	71	84	91	80	70	77	77	-5
Durable Households	80	79	84	78	83	87	80	72	76	75	-5
Technology - Semiconductors	105	100	101	101	105	107	96	94	92	94	-11
Pharmaceuticals	167	179	164	184	171	186	164	163	170	154	-13
Chemical	78	79	76	65	77	86	72	61	67	62	-16
Contract Manufacturers	89	85	87	81	79	68	67	67	68	69	-20
Retail Home Improvement	143	126	130	120	95	87	91	92	95	87	-56

when compared to 2019. On the other hand, we must take responsibility for supply chain leaders failing to deliver a resilient supply chain equal to the COVID-19 challenges.

"If chickens are coming home to roost, someone is suffering the unpleasant consequences of their bad actions in the past."

My friend Trevor says, "Lora, you need to realize that this is a business problem. Supply chain leaders have little say in the business." My retort to Trevor is, "Isn't supply chain about business? Over the last decade, supply chains have become more functional and less effective. The gaps between business leaders grew. Especially grievous are the gaps between finance and operations, manufacturing and procurement, and the operations and commercial teams. We are to blame."

The failure abounds and will become worse. I wince as I push my cart down my Lowe's aisle. Approximately 15% of my local store shelves are empty. Much of the inventory on the ships at sea will miss the essential seasonal windows.

What can we learn? While many are scratching their heads and pointing fingers at the compounding of issues, I hope that business leaders take a hard look at the current state and accept their part in the failure.

1.The Order Is A Poor Indicator of Demand. Traditional supply chain practices model demand based on historic order patterns. In this world of demand volatility, processes need to shift to be outside-in to use market data. Effectiveness in Sales and Operations planned declined over the last decade as organizations attempted to tightly integrate the budget to the demand plan and constrain operations based on the financial plan. Never in the history of supply chain has the financial budget been so out of sync with the market as in 2021.

2.We Assumed that Transportation Would Always Be Available And That We Just Needed to Negotiate Price. In the supply chain, truck drivers are treated as second class citizens. Paid only when the wheels are turning, the asset-intensive carrier base struggled with wait times and warehouse inefficiences. Lane RFPs focused on cost reduction, but few asked if they had a feasible plan. Without any penalties for failure for first-pass tender acceptance, carriers and shippers have played a shell game on price. Over the past decade payments to transportation carriers from shippers increased from net 30 to net 60 moving to net 90 in 2019. When transportation became a bottleneck and a constraint, there was no way for the average shipper to model the impact. Most continued running planning models assuming average leadtimes without variation.

3.Cost and Waste Can Be Pushed Backwards in the Value Chain Without Consequences. Today's investment in value networks is small. Within organizations there is no buying center to invest in building value chain architectures. EDI is slow, expensive and single-directional. The implementation of control towers lack a dial tone giving business leaders a false sense of security.

4.The Efficient Supply Chain Is Effective. Companies do not have one supply chain. Based on the analysis of rythmns and cycles of supply chain variability and constraints, most have five-to-six. Each requires design and fine tuning. However, only 9% of companies actively design their supply chains. The strategy department in most shipper organizations sits in finance while the network design technology expertise is usually a much lower level in operations. The use of spreadsheets in corporate strategy misses the complex non-linearity and variability of supply chain decisions. As a result, most organizations chased lower cost of variable costs without embracing the needs for buffers, variability and constraints. The focus of planning is volume not value, and leaders struggle to change and embrace bi-directional orchestration to capture the price/volume trade-offs between source, make, deliver and plan.

5.ERP Investments in the End-to-End Supply Chain Are Sufficient. When I speak to a supply chain leader, they happily retort the brilliance of their end-to-end strategy. However, when I roll-up my sleeves and get into their strategy, I find that most are investing in transactional efficiency. Over the last decade, ERP technology leaders consolidated and reaped the benefits of maintenance revenues as the gap grew in solutions offered versus the industry need state. Today, only one in two business leaders feel that they are successful in deploying analytics. I find that most supply chain leaders struggle to be heard against the mandates of IT standardization and financial dictates to build the most efficient, low cost supply chain.

What Should We Do

Align the organization against solving the gaps. Call all business leaders together and map the supply chain from the customer's customer to the supplier's supplier and ask for an honest discussion of the current gaps. Challenge the current state. Ask the group to consider:

1.Invest in Market Sensing. Realize the latency and distortion of the current demand planning programs and build outside-in processes. Use data scientists and many start-up cloud-based solutions to write to current systems of record (companies like 1010 Data, Aera Technology, Alloy, Enterra Solutions, o9, Tailwinds, UCBOS, or Zebra Technologies (previously Antuit.ai)) as an overlay to current processes. If you are a current client of E2Open, JDA, Logility, Kinaxis or OMP ask for an overhaul of existing processes to build outside-in capabilities. Use market indicator functionality with conventional APS solutions to drive exception management. Align on the role of the budget and forecast and get clear on the role of each in this world of variability.

2.Build Value Network Capabilities. Stop fooling yourself that investments in enterprise solutions build value networks. Reach out to Supply Chain Operating Network providers like Elemica, GT Nexus (a part of the INFOR suite), Nulogy, and OpenText to begin the journey of building a supply chain bi-directional dial tone. Align internally with the EDI work groups to transition historic EDI to newer technology capabilities. (The looming retirement of the EDI baby boomers is a major risk to the supply chain.)

3.Build Strong Supply Chain Sourcing Development Practices. Only 29% of companies have active supplier development groups. Now is the time to strengthen supply chain relationships with suppliers. Hold yourself accountable for sharing clean and accurate data with minimal latency. Take your foot off the pedal for continued investments in efficient procurement–now is not the time for voice automation, software robots and RFP automation.

4.Design Your Value Chains. Introduce the financial strategy teams to the capabilities in network design tools and build a supply chain planning master data base (conversion rates, lead times and cycle times), to actively design the supply chain based on actuals. Redesign supply chain flows monthly and quarterly across make, source and deliver based on market intelligence.
Redefine Metric Systems and Clearly Define Supply Chain Effectiveness In These Volatile Times. This is unprecedented time. Avoid the discussions on traditional risk management approaches. Instead, align the organization on balanced scorecard of customer service, margin, growth, inventory turns and Return on Invested Capital. Replace functional reward systems with an aligned system for all business leaders. Make supply chain flows the heart of your business systems.
In short, who is responsible for the record profits of the ocean carriers and supply chain failures? My take? The chickens have come home to roost. We are all guilty.

Lora Cecere
Founder at Supply Chain Insights

Essential Key Performance Indicators (KPIs) for Sourcing and Procurement: Looking Back to the Basics

In today's world, the global business scenario becomes more vulnerable and volatile due to the pandemic. Procurement managers are the key persons to shapeup the organizations to overcome future challenges regarding supply and services required to meet the gap between demand and supply. The trend and practice of involving an entire Sourcing and Procurement team in the Sales and Operations Planning (S&OP) have appeared as more important than ever. While playing a big part in the business game, careful and efficient use of Key Performance Indicators (KPIs) for the procurement section has been an important tool to reevaluate the procurement performance and add new values. Across the world, procurement managers are using a set of KPIs that are widely accepted and useful alongside a few new ones which are relative to business situations. But the ongoing pandemic has shown us how old indicators are not sufficient enough to evaluate the health of an organization's procurement practice.

The intention behind this article is to look back with the simplicity that will allow us to revive some of the golden KPIs for global procurement practice. Our proposed KPIs are as follow:

Rate of Emergency Purchases

As one of the evils that exist with the procurement section, the trend of emergency purchases makes all managers unhappy who are trying to pull the chain of inefficient spending through sudden and immediate requirements. As they say, necessity knows no law-some situations cannot be avoided. It is still very crucial to reduce the numbers and amount of emergency purchases. Alongside the usual benefit of reducing emergency purchases like- cost reduction, improved risk management, and sustainable continuity of supply, the lower rate of emergency purchase also lifts the overall transparency throughout the organization. Lesson learning from each past emergency purchase and detailed procurement planning at the beginning of the year can help significantly to achieve a lower rate of emergency purchase. The rate of emergency purchase can be calculated by using the ratio of emergency purchase to total purchases over a specific period of procurement spending.

Intact/Undamaged Shipment Rate

The shipment that is received in good and safe condition can measure the consistency with which suppliers deliver undamaged supplies to the business facilities. The intact supplier shipment ratio can be used as an important KPI for Procurement to determine whether the cycle time for the deliveries to customers is increased when the damaged shipment rate is high. On the other hand, this KPI can indicate how Procurement has failed or succeeded to create standard obligations for the supplier shipments. This KPI remains very significant even during the pandemic or turbulent time to figure out how much useable raw materials or supplies the organization is receiving to ensure the supply flow. The longer delivery period with the high rate of damaged shipment will only delay the whole supply chain process during this pandemic cursed supply situation. The indicator can be measured by taking the total number of undamaged orders received from the suppliers and dividing it by the total number of orders received by that supplier over a set of specific timeframes and multiplying it by 100 to reach a percentage.

Spending Under Procurement

Management spending also known as administrative spending for procurement is the first and foremost project. Secondly, it can also measure the amount of spending going through the channel of procurement. It is believed that more spending through channelized

well-established procurement section will ensure more transparency and accountability. This KPI also allows the setting best practice of spend management through integration and automation that covers sourcing to final settlement. More spending through the procurement system helps to reduce supply costs and risks as an organization can capture exactly what is being processed, from where, and at what price. Moreover, processing the spend through procurement offers certain regulations to maintain standard procurement actions. Higher the rate, better the management health of the organization. This KPI can also be used to evaluate the performance of procurement managers from a management perspective- how the procurement leadership can influence the higher management to spend through the procurement channel. This metric can be calculated by taking the grand total spends of the organization and dividing that number by the total spending through the procurement channel. It is indeed high time to practice this KPI to place a better control mechanism over the grand spending amount.

Proportion of Competitive Spending for Procurement Actions

It is important to segregate the competitive advertisement spending for sales and marketing purposes. It can be a game-changer if competitive procurement advertising spending can be increased to reach to the maximum sources. This metric is important to understand how the competitive procurement advertisement process is significant to measure the success cost of a supply or service and can also be connected to the overall Return on Investment (ROI) from procurement point of view. Considering the current pandemic situation, it would be better to spend more on a robust procurement advertisement process to reach out to the maximum number of potential sources that will ultimately offer the best possible value structure. This metric can be calculated by taking a proportion of competitive spend for a budgeted period and dividing it by the total of all marketing advertising spend for the same product or category.

Proportion of Digitally Enabled Suppliers

Modern procurement is all about digitalization and the technology is shaping the supply scenario for the future. Suppliers capable of pulling data and presenting analytics from digital auction platforms are real winners. Such suppliers are buyers strengths who will continuously seek improvement. Digitally enabled suppliers can track and trace the trend of business well before you as they often surf the globe more than the buyers in search of new opportunities. Technology-driven suppliers are the best fit to become strategic partners of buying organizations as they reduce order cycle time with the help of collecting and evaluating product data within the shortest possible time. This metric can be calculated with the number of fully digitalized suppliers that are aligned with your supply managing system and dividing that number by the total number of suppliers the organization utilized in a specific period. This metric can truly serve the "Go Digital" concept for any Procurement section.

Raw Materials Cost as a Percentage of COGS (Cost of Goods Sold)

Spending high on your raw material may raise product prices. This can be reduced easily if we purchase low quality product. But in the end the business will incur loss. Also, we can increase it by purchasing expensive and good quality products. Then the question would be, Am I being paid by my customer for this huge expenditure? There are many ways to reduce raw material costs such as employing continuous improvement techniques, negotiating discounts with supply chain partners, or implementing supplier management software to identify opportunities for cost reduction. The single best way to rationalize demand forecasting and avoid excess raw materials inventory is by using inventory management software. This measure calculates raw material costs as a percentage of the cost of goods sold (COGS) divided by the total COGS borne over the same period, as a percentage. This calculation should not include indirect raw materials or other indirect expenses when calculating this metric. This measure can be applied to determine the efficiency of procurement processes and where the scope for further improvements is available.

Sustainable supply chain activity starts from responsible sourcing. Right methods for evaluating the actions would impact the ever changing supply chain behaviors. In this path of comprehensive improvement towards more efficient and effective supply chain, Procurement KPIs contribute. Eying to the ongoing turbulent time of global supply management scenario, it would be relevant to focus on some metrics as presented above to revisit the basic compliance of procurement performance measurement.

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Importance of data analytics in Supply Chain across industries

Supply Chain Management Overview

Supply Chain Basics is an overview of the concepts of Supply Chain Management and logistics. It demonstrates that, product supply chains as varied as bananas, to high fashion apparels, to cement, to electronics, have common supply chain elements. There are many definitions of supply chain management but, ultimately, supply chains are the physical, financial, and information flow between trading partners that ultimately fulfill a customer request. The primary purpose of any supply chain is to satisfy a customer's need at the end of the supply chain. Essentially supply chains seek to maximize the total value generated which is defined as, the amount the customer pays minus the cost of fulfilling the need along the entire supply chain. All supply chains include multiple firms.

Key Concepts

While Supply Chain Management is a new term (First coined in 1982 by Keith Oliver from Booz Allen Hamilton in an interview with the Financial Times), the concepts are ancient and date back to ancient Rome. The term "logistics" has its roots in the Roman military.

- Logistics involves. . . "managing the flow of information, cash and ideas through the coordination of supply chain processes and through the strategic addition of place, period and pattern values" -- MIT Center for Transportation and Logistics
- "Supply Chain Management deals with the management of materials, information and financial flows in a network consisting of suppliers, manufacturers, distributors, retailers and customers" - Stanford Supply Chain Forum
- "Call it distribution or logistics or supply chain management. By whatever name, it is the sinuous, gritty, and cumbersome process by which companies move materials, parts and products to customers"-- Fortune 1994

Supply chain management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies.

Defining data analysis and data analyst

there's a growing need for data analysis and data analysts. So what is data analysis? There are lots of definitions but ultimately, it's the process of inspecting, cleaning, transforming and modeling data for 1 business decision-making. You might then ask the obvious, what's a data analyst and let me assure you, it's not one size fits all. Data analysts work with any one of those processes or all of them. Data analysts' work is as diverse as the job descriptions you'll read while looking for data jobs. The data analysts will work with data in all shapes and fashion and the tools are as diverse as the data we encounter. Data analysts might often start with lines of data in databases, spreadsheets or even CSV files. They turn those records into more meaningful results for others to interpret. Remember, a picture is worth a thousand words or in the case of data, a chart is worth a thousand lines. Data analysts have the great fortune of sometimes creating powerful visualizations of data.The IDC (International Data Corporation - the premier global provider of market intelligence) predicts by 2018 a need for 181,000 people with deep analytical skills and for the data analyst jobs that require basic data management and interpretation, the need is five times greater.

Magnitude of Information Growth

The amount of digital information being produced is increasing . . .

- A total of 1.5 Exabytes of unique information was produced in 1999. This grew to 5 Exabytes by 2003.

- IDC calculated that from 2006 to 2012 the amount of data generated increased from 161 to 2837 Exabytes! (1 Exabyte =1 billion Gigabytes)

This information is coming from a wide variety of sources . . .

Facebook's 1.2 billion active daily users post 300 million
photos and 4.5 billion "likes" a day!

Twitter averages 6,000 tweets posted every second!

Google processes over 40,000 search queries every second on average!

Few Examples information growth in supply chains . . . .

Amazon sells more than 480 million unique items to 244 million
customers!

Walmart handles more than 1 million customer transactions every hour, which is imported into databases estimated to contain more than 2.5 petabytes of data.

Every day, on average, UPS delivers over 20 million packages and documents to more than 8.4 million delivery points using over
100,000 delivery vehicles.

Macy's adjusts pricing in near-real time for 73 million items, based on demand and inventory, every day.

Other contributing factors . . .

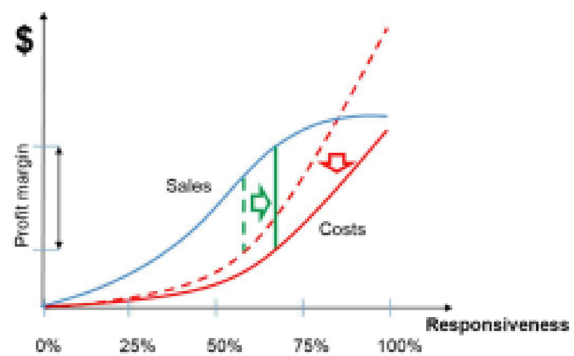
• Sensors – generating ever more data
- Automobiles have 60-100 sensors today and will increase to over 200
- Smart packaging for shipment of perishable items captures temperature, humidity, etc. while in transit
- Automated diagnostic tests on computers and servers

• Internet of Things – machines communicating with machines
- There are ~6.4 billion connected things in use worldwide in 2016.
- Gartner forecasts that number will grow to ~21 billion by 2020.
- Estimates of 170 million wearable devices online by 2019.

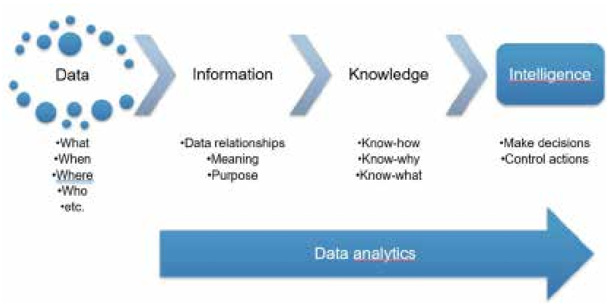
• Regulations – increasing the information required to store
- 2013 Drug Supply Chain Security Act (DSCSA) requires "serialized numeric identifier" (SNI) o Example (Basta): Transaction records for a single batch of 10,000 units
- Pre-Serialization: 4 transactions (Create batch, Pick pallet, Ship pallet, Send ASN) ~ 2KB data
3- Post-Serialization: 60k transactions (10k each for Provisioning, Commissioning, Aggregating, Picking, Shipping, and Sending SNI data) ~ 11MB data

Impact of information systems in the supply chain

- Information systems can increase profits by improving key processes and making the supply chain either more responsive or more efficient.



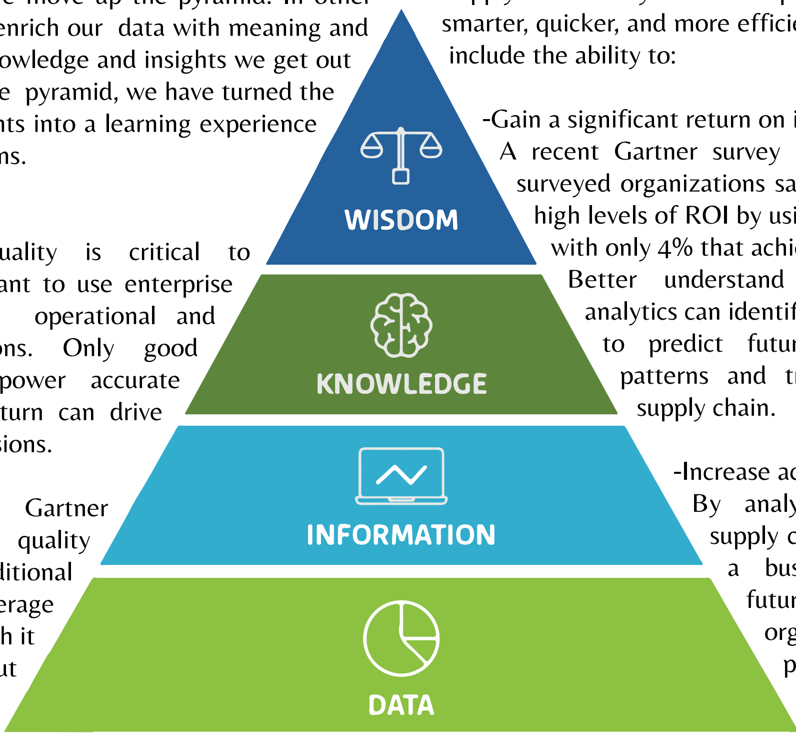
The DIKW Pyramid represents the relationships between data, information, knowledge and wisdom (Intelligence).
Each building block is a step towards a higher level - first comes data, then is information, next is knowledge and finally comes wisdom/Intelligence. Each step answers different questions about the initial data and adds value to it. The more we enrich our data with meaning and context, the more knowledge, and insights we get out of it so we can take better, informed and data-based decisions.



Knowledge Pyramid, Wisdom Hierarchy and

Information Hierarchy are some of the names referring to the popular representation of the relationships between data, information, knowledge and wisdom in the Data, Information, Knowledge, Wisdom (DIKW) Pyramid. Like other hierarchy models, the Knowledge Pyramid has rigidly set building blocks – data comes first, information is next, then knowledge follows and finally wisdom is on the top.

Each step up the pyramid answers questions about the initial data and adds value to it. The more questions we answer, the higher we move up the pyramid. In other words, the more we enrich our data with meaning and context, the more knowledge and insights we get out of it. At the top of the pyramid, we have turned the knowledge and insights into a learning experience that guides our actions.



Data quality:
Measuring data quality is critical to understand if you want to use enterprise data confidently in operational and analytical applications. Only good quality data can power accurate analysis, which in turn can drive trusted business decisions.

According to one Gartner estimate, poor data quality can result in additional spend of $15M in average annual costs. Although it is not just about financial loss. Poor quality of data affects your organization at multiple levels such as

(a) Higher processing cost,
(b) Unreliable analysis,
(c) Poor governance and compliance risk &
(d) Loss of brand value.

That's why it is very important to know the dimensions of data quality. Data quality dimensions are measurement attributes of data, which you can individually assess, interpret, and improve. The aggregated scores of multiple dimensions represent data quality in your specific context and indicate the fitness of data for use. The first and foremost tool to improve data quality is ensure capturing the correct data. So, to get / ensure correct data following "automatic data capturing technologies" should be used.

-Bar code
-RFID
-GPS
-Voice recognition
-OCR
-QR/ECR
-Cameras / imagers / object recognition

Why is supply chain analytics important?
Supply chain analytics can help an organization make smarter, quicker, and more efficient decisions. Benefits include the ability to:

-Gain a significant return on investment:
A recent Gartner survey revealed that 29% of surveyed organizations said they have achieved high levels of ROI by using analytics, compared with only 4% that achieved no ROI.
Better understand risks Supply chain analytics can identify known risks and help to predict future risks by spotting patterns and trends throughout the supply chain.

-Increase accuracy in planning
By analyzing customer data, supply chain analytics can help a business better predict future demand. It helps an organization decide what products can be minimized when they become less profitable or understand what customer needs will be after the initial order.

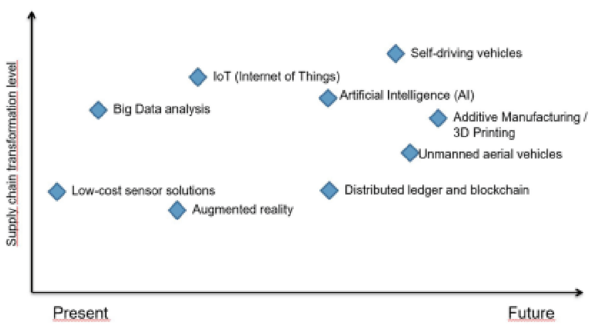
-Achieve the lean supply chain
Companies can use supply chain analytics to monitor warehouse, partner responses and customer needs for better-informed decisions.

-Prepare for the future
Companies are now offering advanced analytics for the supply chain management. Advanced analytics can process both structured and unstructured data, to give organizations an edge by making sure alerts arrive on time, so they can make optimal decisions. Advanced analytics can also build correlation and patterns among different sources to provide alerts that minimize risks at

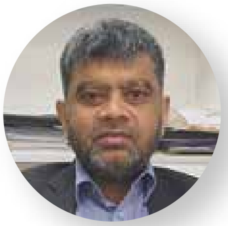
little costs and less sustainability impact.
As technologies such as AI become more commonplace in supply chain analytics, companies may see an explosion of further benefits. Information not previously processed because of the limitations of analyzing natural language data can now be analyzed in real time. AI can rapidly and comprehensively read, understand and correlate data from disparate sources, silos and systems. It can then provide real-time analysis based on interpretation of the data. Companies will have far broader supply chain intelligence. They can become more efficient and avoid disruptions — while supporting new business models.

Evolution of supply chain analytics

Following emerging digital technologies are transforming the supply chain in different levels. An example is given below – the Emerging digital technologies of the present and future and their impact on supply chain transformation.



In the past, supply chain analytics was limited mostly to statistical analysis and quantifiable performance indicators for demand planning and forecasting. Data was stored in spreadsheets that came from different participants within the supply chain.
By the 1990s, companies were adopting Electronic Data Interchange (EDI) and Enterprise Resource Planning (ERP) systems to connect and exchange information among supply chain partners. These systems provided easier access to data for analysis, along with assisting businesses in their designing, planning and forecasting. 7
In the 2000s, businesses began turning to business intelligence and predictive analytic software solutions. These solutions helped companies gain a more in-depth knowledge of how their supply chain networks were performing, how to make better decisions and how to optimize their networks. The challenge today concerns how companies can best use the huge amounts of data generated in their supply chain networks. As recently as 2017, a typical supply chain accessed 50 times more data than just five years earlier. However, less than a quarter of this data was being analyzed. Further, while approximately 20% of all supply chain data is structured and can be easily analyzed, 80% of supply chain data is unstructured or dark data. Today's organizations are looking for ways to best analyze this dark data.
Studies are pointing to cognitive technologies or artificial intelligence as the next frontier in supply chain analytics. AI solutions go beyond information retention and process automation. AI software can think, reason and learn in a human-like manner. AI can also process tremendous amounts of data and information — both structured and unstructured data — and provide summaries and analyses of that information in an instant.
IDC estimates that by 2020, 50% of all business software will incorporate some cognitive computing functions. AI not only provides a platform for powerfully correlating and interpreting data from across systems and sources — it also allows organizations to analyze supply chain data and intelligence in real-time. Coupled with emerging blockchain technologies, companies in the future will be able to proactively forecast and predict events.



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Why do we need resilient and viable supply chains? A COVID-19 pandemic perspective

Over the past decade, global supply chains have faced enormous disruptions. The supply chain is being disrupted on a large scale, posing unknown risks. The complexity, timing, and location of the occurrence make them unpredictable as businesses are challenged to operate in a volatile, uncertain, complex, and ambiguous (VUCA) environment. The current COVID-19 pandemic has disrupted global supply chains, whose impact is yet to be determined. Because of the lockdown, shutdown, and border closures, global supply chains experienced supplier failures, production capacity degradation, restrictions in transportations, and insufficient inventory to meet the extra demand. Essential and high-demand goods manufacturers experienced a significant increase in demand. Luxury and low-demand product producers, however, were hit by a significant drop in demand. As a result, they struggled to continue operating. The long-established supply chains were unable to handle the large-scale disruption of the COVID-19 pandemic. Understanding the risks in supply chains as a result of large-scale disruptions, as well as evaluating the implications of reconfigurable solutions to control uncertainty, is crucial.

This article aims to discuss how the COVID-19 pandemic has caused uncertainty within global supply chains (SCs), the simultaneous and dynamic impacts of the pandemic on supply chains across multiple levels, managing the impact of the pandemic, and ways of creating resilient and viable supply chains.

1. COVID-19 pandemic and uncertainties in lobal supply chains (SCs)

Large-scale disruptions cause unlimited supply chain uncertainties. The recently occurred pandemic caused by the COVID-19 pandemic can be taken as an example to understand how large-scale disruptions cause uncertainties in supply chains. The COVID-19 pandemic has drastically impacted the global supply chains, the impact and uncertainties of which are yet to know (Paul et al., 2021). The COVID-19 pandemic has imposed environmental uncertainties, economic uncertainties, operational and technical uncertainties, and human thinking and decision-making uncertainties for the supply chains of the businesses of the world.

•Environmental uncertainties

Environmental uncertainty refers to unpredictable changes that occur externally. These external changes cause instability in the environment of the regular businesses, the degree of which is hard to understand, estimate and make sense (Fazli-Khalaf et al., 2020). The supply chains of the businesses can not merely understand how an external environment might change but what strategies they might initiate to manage the changes.

•Economic uncertainties

Internal and external economic uncertainties are major sources of uncertainties within supply chain networks. In the global context, global shutdown impacted by US/China trade war, Brexit, global lockdown, and shutdown due to pandemic caused by COVID-19 posed severe economic impact on the global supply chains. Businesses cannot control everything outside the organizations. Supply chains should be strategic, flexible, and dynamic in responding to external changes that might give a timely solution.

•Operational and technical uncertainties

Manufacturers need to invest more in high-tech to foster the manufacturing process that may deal with the operational and technical uncertainties timely. Uncertainties sometimes cause a capacity shortage for which manufacturers become unable to fulfill the demand surge of the consumers. This condition increases the shortage costs of the supply chains.

•Human thinking and decision-making uncertainties

In this time of artificial intelligence, human knowledge is also very important to manage supply chain uncertainties. Weak coordination, weak control of logistics, weak decision-making capability, and lack of knowledge of the top management are all examples of human thinking and uncertainty in the industry. Without proper guidance of human intelligence, artificial intelligence in supply chains may lead to disasters.

2. Simultaneous and dynamic impacts of the COVID-19 pandemic in SCs

The global supply chains have faced a series of simultaneous dependent and independent disruptions over time during the pandemic caused by the COVID-19. Simultaneous disruptions across the supply chains can be dependent which is concurrent or parallel and can also be independent which is non-concurrent or sequential in nature. For example, in one region a manufacturing facility is partially shutdown due to the emergence of coronavirus cases, because of this, the production capacity has decreased. If this situation continues for a further five weeks, then the situation gets better, and the suppliers start to operate in full swing. Then, once again, another outbreak disrupts the continuous improvement and recuperation of supply networks. According to Table 1, both Australia and China lost economic growth in several sectors due to the severance of their supply chains during the pandemic. Countries with established suppliers benefited economically from the pandemic. Figure 1 shows some statistics about supply chain disruptions in the top Australian industries. Following are the simultaneous and dynamic impacts of the COVID-19 pandemic across multiple levels of supply chains:

	GDP ($ Millions)					CO2 (Mt)				
	Apparel	Medicinal products	Electronics and optical products	Electrical equipment	Machinery and equipment	Apparel	Medicinal products	Electronics and optical products	Electrical equipment	Machinery and equipment
Australia	-2232.9	-144.1	-3516.4	-1044.4	-950.4	-0.1	0.0	-0.5	-0.2	-0.1
China	-196.4	-50.0	-837.3	-269.0	-286.7	0.3	0.1	0.7	-0.2	-0.1
Hong Kong	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
ASEAN	35.5	-0.4	40.8	11.7	12.8	0.1	0.0	0.3	0.1	0.1
Developed Asia	13.9	-1.2	71.1	29.1	30.1	-0.1	0.0	0.4	0.1	0.1
India	16.7	1.8	4.2	11.3	6.6	0.0	0.0	0.2	0.0	0.1
Developing Asia	34.0	0.1	1.1	0.7	0.5	0.0	0.0	0.0	0.0	0.0
US	-7.1	10.8	201.8	45.6	42.2	0.0	0.0	0.6	0.1	0.2
Other North America	14.4	1.1	39.1	11.5	9.5	0.0	0.0	0.1	0.0	0.0
Central and South America	15.6	-0.8	21.4	7.9	8.7	0.0	0.0	0.0	0.0	0.0
EU + UK	56.7	25.9	200.0	113.6	105.6	0.0	0.0	0.1	0.1	0.1
Non-EU Europe	15.1	-4.8	1.4	0.1	0.4	0.0	0.0	0.0	0.0	0.0
Africa	34.6	1.9	26.2	12.6	10.5	0.0	0.0	0.0	0.0	0.0
Rest of world	57.5	2.3	35.8	23.5	15.9	0.1	0.0	0.1	0.0	0.0
World total	-2142.5	-157.4	-3711.1	-1045.9	-994.3	0.3	0.1	1.9	0.1	0.4

Table 1: Cut-off of Australian imports from China and its impact on the economy and emissions

•Impacts on SC demand management

During the pandemic, the global supply chains faced severe demand fluctuation of the high demand products and low demand products as well. Suppliers failed to provide raw materials to the manufacturers in other countries, because of this, the manufactures could not ramp up the production capacity to meet the demand surge of the consumers. People panicked purchased the high-demand essential products that caused severe stockout of the products in the super shops.

•Impacts on SC supply management

Most of the countries of the world imposed strict restrictions on the borders, imposed lockdown, and shut down inside the country to flatten the curve of COVID-19 infected cases. Manufacturers struggled to receive raw materials from suppliers situated in quarantined zones. Many manufactures have only one supplier from one geographical location. These supply disruptions impacted the manufacturing facilities. They could not increase the production capacity to meet the demand surge of the consumers.

•Impacts on SC production management

Most of the manufacturers could not upgrade the infrastructure to facilitate the employees to continue their work as a strict guideline for social distance was imposed by the government. Due to supply and demand disruptions, the manufactures could not accelerate the production capacity. Many industries had to forcefully shut down the operations of manufacturing due to severe loss and debt.

•Impacts on SC transportation and delivery management

Timely delivery of the ordered products to the consumers is essential for the supply chains of the businesses to get rid of the backlog of the orders and associated costs. Maintaining goodwill is another important issue for businesses by delivering products to consumers timely. Unfortunately, due to lockdown and shutdown conditions in most of the countries, businesses related to high demand luxury products struggled to maintain quick delivery because of shortage of products due to low production capacity of the manufacturers and strict lockdown situation because of increasing COVID-19 infection cases.

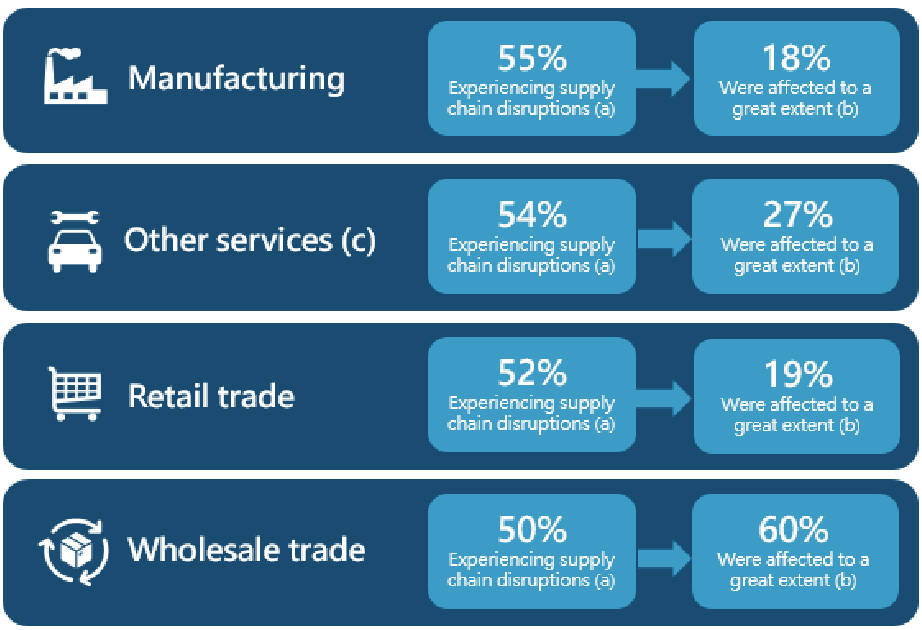
•Impacts on SC information management

The demand of essential products increased because of fear of lockdown due to the COVID-19 pandemic. Current global supply chains of the essential products struggled to get the information related to the exact demand of the consumers because of a lack of dynamic demand forecasting capability, technology, and infrastructure. Decision-makers could not take a timely decision to recover the supply chains due to a lack of information regarding the extraordinary disruption caused by the crisis.

•Impacts on SC financial management

Supply chains of the manufacturers worldwide faced severe supply and demand disruptions throughout the pandemic caused by COVID-19. Manufacturers could not ramp up production capacity to meet the extra demand of the essential products of consumers. As a result, essential product's manufacturers faced severely increased shortage costs. On the other hand, as the demand of luxury products declined, many had to limit the production that affected their

Figure 1: Supply chain disruptions in top Australian industries (ABS, 2021)



(a) Proportions are of all businesses
(b) Proportions are of businesses experiencing supply chain disruptions
(c) Includes repair and maintenance, personal (e.g. hairdressers) and other services

revenue. Large-scale disruption impacted the financial management of the global supply chains extremely.

•Impacts on SC sustainability performance

COVID-19 pandemic has largely impacted all levels of supply chain networks, the impacts of which have severely downgraded sustainability performances of the global supply chains. The essential manufactures of personal protective equipment such as facemasks had to ncrease their production capacity to meet the consumer demand (Rahman et al., 2021). Due to the lockdown and shutdown situation, the supply chains faced increased shortage costs. Many employees lost their jobs due to the permanent shutdown of many manufacturers due to drastic disruption and the world economic recession caused by the pandemic. The reputation of most of the manufacturers was also severely hampered.

3. Planning and strategies to mitigate COVID-19 related impacts in SCs

Recovery planning to manage large-scale disruptions has gained much attention. In literature, the theme of reconfigurable strategies has not been focused on widely. The COVID-19 pandemic has proved that the current global supply chains need a redesign to sustain any future extraordinary disruption (Chowdhury et al., 2021).

•Intertwining

During the COVID-19 pandemic, many manufactures of essential and luxury products faced severe demand disruptions. The automotive and electronic industries faced a severe shortage of semiconductors due to an initial low demand of consumers. This is the idea of intertwining supply chains. To make the supply chains viable, the manufacturers need to adapt dynamic intertwining strategies to survive during disruption.

•Substitution

Substitution adaptation strategies work at the network and resource capabilities level of the viable supply chains. Structural network reconfiguration and product substitution are the main themes of this category of adaptation strategies. Due to the emerging global pandemic caused by COVID-19, most of the countries of the world had to close the border with the countries more prone to the virus. Manufacturers in one country who had dependencies on both local and overseas suppliers faced severe supply shortages. Most of the researchers suggested looking for alternative/backup suppliers to receive the raw materials smoothly.

•Scalability

Scalability adaptation strategy works at the network and resource capabilities level of the viable supply chain like substitution adaptation strategy. During the pandemic, the demand of essential products such as food, healthcare items, facemask, ventilators etc. surged. The essential manufacturers need to scale up their

Viable supply chain layers	**Adaptation strategies**			
	Intertwining	Substitution	Scalability	Re-purposing
Ecosystem	Intertwining of different supply chains			
Network		Structural network reconfiguration	Network size scalability	Process flexibility by re-purposing of flows
Resources		Product substitution	Capacity expansion at firm's resources	Products flexibility by re-purposing of resources

Table 2: Adaptation strategies for supply chain reconfiguration capabilities (Ivanov, 2020)

Decision-makers need to adopt reconfigured SC strategies to make SCs more resilient and sustainable. Table 2 shows some examples of adaption techniques for dealing with large-scale SC disturbances for a viable supply chain. Based on Australia's supply chain disruptions, Figure 2 shows some changes to suppliers.

production capacity and expand their supply chain network to meet the extra demand of the consumers.

•Repurposing

Adaptive re-purposing strategy also works at the network and resource capabilities level of viable supply chains like the adaptive strategy substitution and

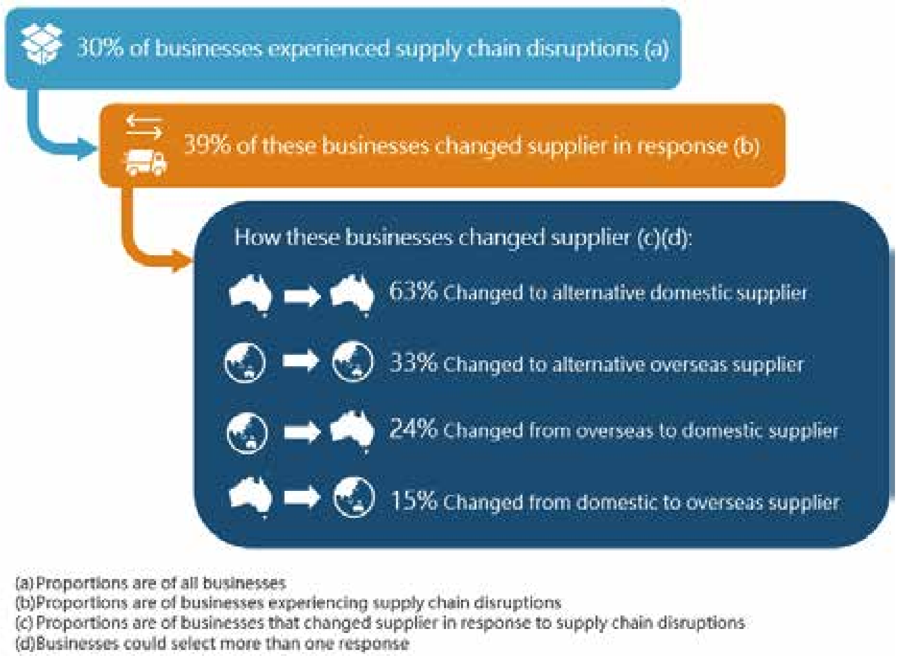


Figure 2: Changes in suppliers due to disruptions in the supply chain in Australia (ABS, 2021)

scalability (Ivanov, 2021). Ford Motor Company strategically utilized their production line to produce personal protective equipment i.e., face shield to meet the ongoing demand during the pandemic. Many garment factories that could not find enough order of the apparel items during the pandemic repurposed their production lines.

4. Future supply chains: Pathways to viability and resilience

In order to ensure the viability of their supply networks, decision-makers need to act quickly. Whenever disruptive events occur, decision-makers should use reconfiguration approaches to align supply chains for robust and viable supply chains. The supply chain manager must develop a set of reconfigurable, adaptable, and dynamic approaches to help supply chains recover from super disruptions. During mega disruptions, such as the COVID-19 pandemic, different tiers of supply chains are affected simultaneously. The effects are unclear. Adaptation strategies such as scaling, substitution, repurposing, and interweaving can help deal with the unknown-unknown uncertainties of a pandemic. It is, therefore, crucial to detect and measure uncertainty in supply networks. To ensure the viability of supply networks, a reconfigurable method that reduces the uncertainty caused by large-scale interruptions is needed. To put it simply, businesses (and governments) everywhere should integrate resilience into every critical supply chain on the planet; it is the only solution to large-scale, unpredictability. Recently, the supply side of manufacturing has been underrepresented in supply chain developments, and it should now be the focus and brought under more systematic and coordinated control. That's because disruptions largely begin on the supply side. As a result of the COVID-19 pandemic, the supply chain was affected initially on the supply side and later on the demand side. Procurement needs to begin segmenting their entire supplier pool based on skills, expectations, and different conditions, rather than simply focusing on compliance. Therefore, real-time information flow is essential among supply chain stakeholders using a secure, immutable, and trustworthy channel, which can be established using emerging technologies such as the internet of things (IoT), big data analytics, blockchain as well as reinforcement learning and artificial intelligence. These technologies can effectively identify the root cause of disruptions and offer solutions. In many cases, practitioners can utilize such technologies to enable reconfigurable solutions that increase supply network resilience and sustainability. They may put the technologies to the test and make significant changes to the strategy's dynamic in order to make supply chains more viable and robust.

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Our Accomplishments

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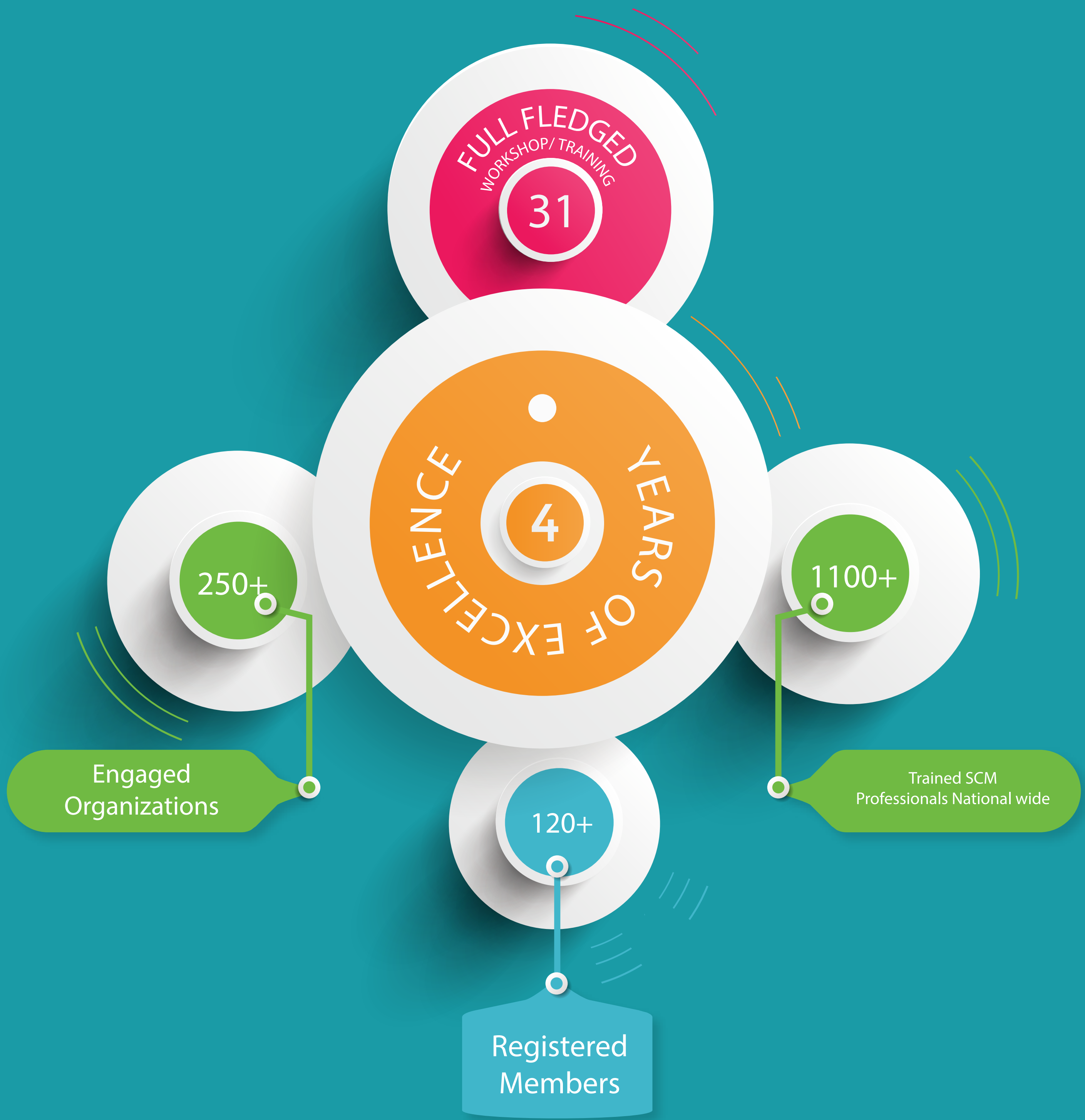

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Training on LC

Volunteers of ASCPB after closing a program

Workshop on Competitive Supply Chain

Website Launching Ceremony of ASCPB

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