

THE SUPPLY CHAIN STREET

MAGAZINE



AUGUST 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



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Preface

It's a wonderful feeling to share with all that the Alliance of Supply Chain Professionals in Bangladesh (ASCPB) is publishing the 4th issue of their magazine, which is known as "The Supply Chain Street".

The process of Supply Chain involves every aspect of business operations, including logistics, purchasing and information technology. It integrates materials, finances, suppliers, manufacturing facilities, wholesalers, retailers and consumers into a seamless system. The supply chain is a very complex yet super exciting field to explore as professionals.

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 a fast-paced supply chain management in the era of Industrial Revolution 4.0, ASCPB is playing a significant role every year by organizing several online trainings on various contemporary supply chain topics at a very nominal cost. I think these training sessions can allow our professionals to see things differently for future advancement.

It is a great pleasure for me to share that I'm also a member of the advisory board of The Supply Chain Street Magazine. The previous issues of Supply Chain Street have been widely acclaimed by supply chain professionals at all levels in Bangladesh.

I congratulate the entire Supply Chain Street team and wish them every success to continue their journey towards brilliance.



Mohammad Ashraful Islam Khan
Head of Supply Chain Advisory Services,
Management Consulting, KPMG Bangladesh

Message from President

“Great companies are built on great products. When the product starts to become shoddy and uncompetitive, so does the company.” ~Elon Musk.

“Supply chain.” These words can arouse the opposite emotion, depending on your point of view.

From many business angles, the supply chain is driving business operations and providing significant benefits to the end consumers because the law of comparative advantage guarantees the availability of the desired goods and services at everyone’s preferred locations. Supply chains also offer unprecedented potential for producers, opening their markets to a larger population.

From another perspective, the supply chain can hit the economy in various 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. Delays in the collection of these products are also a matter of concern.

According 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 in deep focus on all aspects of the company’s development, research and services and who can really help to make their organization effective and efficient.

Constantly, we provide experience and opportunities that are unprecedented. You shall read about some of the selected experiences and potential career fields in the supply chain sector in this astonishing 4th issue of “The Supply Chain Street”.

It is always a great pleasure and honor to be working with these winning alliances. I always believe in continuous learning and I’m learning every day from each one of you. A big congratulations to all the members and contributors & associates of “The Supply Chain Street” and best wishes for the future.

Thank You.



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Managing Agrichemical Supply Chain: Complicatoinis & Initiatives

In this article, briefly, we would like to talk about the agrichemical supply chain and its key challenges in Bangladesh and a few initiatives taken to manage its complex supply chain. We wish readers from other industries might get an idea of its exclusive supply chain model. In brief, agrichemicals refer to mostly pesticides, including insecticides, herbicides, and fungicides. It may include synthetic fertilisers, hormones, and other chemical growth agents.

The approximately market size in Bangladesh is around 2500 crore, and it is increasing every year mainly because of rice dependency, vegetable, potato & corn/other seed,s and it is a key market for pesticides & fungicides portfolio and also micronutrients.

To handle such large volumes, robust supply chain management will be required; otherwise, businesses and end users (farmers) will be impacted. Sustainability in food security is of paramount importance to the Bangladesh government, which is one of the most densely

populated countries in the world and highly dependent on rice cultivation.

In Bangladesh, our brands are one of the most prominent names across the farmer community when it comes to agricultural solutions and products (pesticides, fungicides, insecticides, herbicides, nutrients etc.). It has got a unique supply chain (more than 400 distributors and 11000+ exclusive retailers) with the ambition to contribute to sustainable agriculture and ensure food security in Bangladesh.

We import critical bulk materials from 10 different countries and 13 different production sites across the universe, including one Bangladesh factory and one toller factory. In a nutshell, the total portfolio includes Crop Protection-Pesticides, fungicides, herbicides, insecticides, and micronutrients approximately brands and 120 SKU and Field crop/Vegetable seed, totalling 90 SKU.

Global Supply Network Diagram



Figure 1: Global Supply Network

On such a note, I am going to share one of the situations recently faced last year about a supply shortage.

On a typical day in Mid Sept 2021 after coming to the office, I got to have some critical conversations with our commercial colleagues. There is a stock-out situation, and for supply chain planning professionals, it is a nightmare conversation, as we all know.

An ad-hoc meeting has been requested related to this stock-out situation of this strategic product of the Pesticide family. What happened is that there is a planthopper species called “brown planthopper (BPH)” that feeds rice plants. If it is infested, this species will take 3-4 days only to destroy the entire paddy field. The only solution is to apply chemicals in the paddy field whose supply we manage as per the demand forecasting.

It is important to say rice is cultivated in Bangladesh throughout the year as Aush, Aman or Boro season. Aman season is generally cultivated in December-January, Boro in March-May, and Aus in July-August cropping seasons. Among these cropping transplanted, Aman is most important and occupied about 46% of the rice cultivated land in 2009-10.

So, we have reviewed the situation and found that in last month’s S&OP, the business would be ok to have a certain amount of supply to support the demand. Now there is a significant amount of demand upside due to this sudden infestation of brown plant hopper in the northern area mostly.

We have immediately requested our overseas formulation plant to arrange some stock if they can. But unfortunately, the upstream supply chain is not ready, and this is a demand upside. Generally, demand from 5-6 countries

is combined and plan the formulation of a particular pesticide to minimise the cost & it is process industry and batch manufacturing. At this moment, the formulation line is occupied by other products. Changing the line to manufacture only for Bangladesh at this moment is not viable and will be a terrible loss & arranging other AI (active ingredients), and auxiliaries materials on short notice through an international chemical supplier are not feasible.

I have reached out to other countries if they give some stock to Bangladesh, which is not an option. Note that this industry is extremely regulated by a governing body. Before the importation of a pesticide or herbicide, etc., we need to obtain a registration which usually takes 3-4 years. Compatibility data after a sequence of trials to be obtained and shared with authority. If authority gets good results after trials and only then will registration be given.

After some persuasion, we have found some stock lying unutilised in the overseas production plant which is to be exported to other countries, but due to some reason, they can give us. Good news for us as we have proceeded to open a letter of credit (LC) and request the 4PL team to vessel booking. Again, luck is not on our side. There is huge delay & congestion in all the transshipment ports (mostly Singapore/ Colombo/Malaysia) in this pandemic context, and vessel sailing time would be taking 3-4 weeks additional time.

For these high-volume bulk materials, air shipment is not an option, certainly. Note that these types of products are mostly Dangerous class (spreading through 1- 9 depending on type & unique characteristics).

Finally, around four weeks later, we have managed to ensure supply to the local market, but the “Aus” season is over. Note that the demand window in this industry is seasonal and is extremely limited, unlike other industries. Nature is the ultimate decider in setting the demand pattern.

So the conclusion is that this stock will only be consumed in the next rice season resulting in higher inventory at this moment. At least, we will be complacent that next season has stock on our hands.

To avoid this kind of situation, we have approached to strengthen data-driven techniques and tools which help to connect the global supply chain to customers. We have increased our internal process through systems where our products are coming from and where they are going.

In such context, we have taken a few initiatives to work as a lever for supporting the business of the country & do the best collaboration and bring agility to the supply chain.

► Strengthening the country S&OP processes (dialogue - marketing & sales, supply planning, distribution, logistics & production sites).

SL NO	Key S&OP Activities at Syngenta Bangladesh	Now	Previous
1	Country Demand Dialogue	√	×
2	Generating statistical forecasting & prepare baseline demand projection.	√	×
3	Review by Marketing team	√	×

- ▶ Create SLA/KPIs based supply planning with all the factories.
 - ▶ Monitoring Forecasting accuracy & bias by portfolio/brand.
 - ▶ Inventory coverage tracking- weekly.
 - ▶ Empowered data analytics, creating the connections and increasing utilization of tools (SAP, APO, dashboards & IBP).
- ▶ Master data.
 - ▶ Adaptation of KPI monitoring tool (Qlik sense).

In a nutshell, below is essential if we want to manage agrichemical supply chain efficiently & support the business.

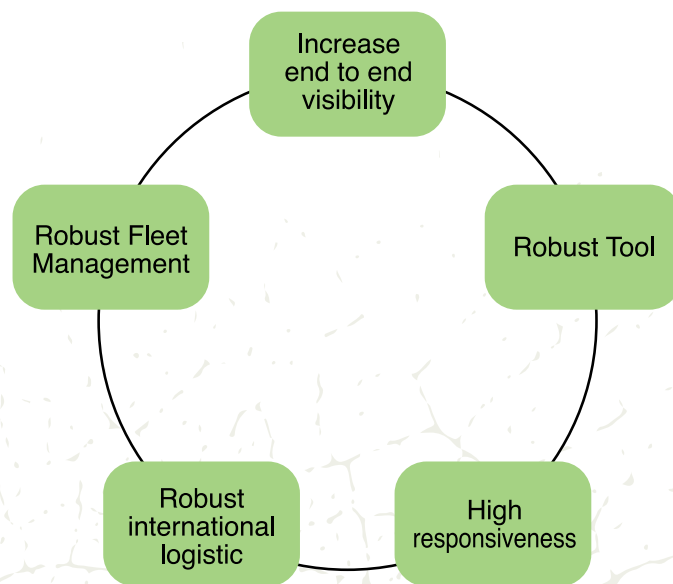


Figure 2: Pre-requisite of managing agrichemical supply chain.

Hope readers will have some idea of this kind of supply chain. If not, I can be reached out to help you out.

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Big Supply Chain Analytics: From Generating Big Data to Generating Insights

In the typical business, their supply chain generates nearly 80% of the data from functions including sales and distribution, manufacturing, and procurement. This makes it a popular area for analysis by data scientists. The current movement of digitizing supply chains has continued to encourage this trend as the amount of easily available data actively accumulates. In an era, where the importance of data is now understood, businesses that invest in building required infrastructure, governance, and processes set themselves up for long term growth. With this in mind, there is still work to be done in aiding businesses in optimising their uses of digital supply chains.

In the words of Peter Sondergaard, “Information is the oil of the 21st century, and analytics is the combustion engine. Businesses that are able to harness the true potential of big supply chain data continue to prioritize differently compared to their competitors. These Company’s focus on generating actionable insights over simple

data generation. As such the question must be shifted to asking how businesses can generate actionable insights.

The answer lies within the concept of big supply chain analytics.

Big supply chain analytics covers a range of supply chain applications that can be used to generate insights at different decision-making levels including strategic, tactical, and operations. Most of these applications are not new to the business. However, when these concepts are combined with big supply chain analytics, more accurate and efficient insights can be generated, thereby supporting supply chain stakeholders in becoming proactive decision-makers.

Let’s dig a little deeper into big supply chain analytics:

According to the Supply Chain Operations

Reference (SCOR®) model, supply chains can be examined through the following elements: plan, source, make and deliver. Below we examine these concepts and what they each bring to the formation of an overarching plan.

Plan: Based on experience, the plan element has the most untapped potential to be utilized in supply chain analytics. This is particularly true when looking at applications in the Sales and Operations Planning (S&OP) process. This is due to the collaborative process involved in designing an entire supply chain such that it works on a demand-driven approach; the goal being the creation of a single demand forecast across the supply chain.

exponentially; generating, storing, processing and forecasting begin to require the use of big data tools, technologies, and advanced analytical models. Additionally, as systems get more complex, manual overrides may need to be incorporated into the base forecast. For example, a brand manager may add an additional demand to the forecast based on the upcoming marketing campaigns.

Finally, it is imperative that the forecast is shared amongst multiple stakeholders in your supply chain including finance, procurement, manufacturing, and sales so that they are able to vet and verify its feasibility.



These requirements clearly make Sales and Operations Planning one of the most interesting big supply chain analytics applications for data scientists and supply chain professionals.

Source: The source element primarily covers the procurement function of a business. There are several big supply chain analytics applications under the source. One of its key applications is inventory management. Identifying the correct

When generating the demand forecast, a demand planner may have to deal with thousands or sometimes millions of demand patterns. For example, if your product master has 200 products selling to 500 customers, there are 100,000 potential bottom-level demand patterns. Plus you may have different product hierarchies (category, brand, sub-category, etc.) and sales hierarchies (area, region, sales manager) which further increase the number of demand patterns.

As the number of demand patterns grows

inventory levels requires running multiple scenarios. In a conventional supply chain, inventory levels are often defined using a linear formula. Even though this method is easy to use in a simple spreadsheet, it could result in unnecessary inventory buildups and poor service levels if not properly monitored.

Prescriptive analytical models such as optimization modeling and simulation modeling are used to avoid these issues arising in inventory management. With the use of big data tools and techniques, it is possible to run

thousands of simulations in a span of a few minutes, generating optimum inventory levels for a given SKU portfolio.

Spend analytics, category management, and supplier risk analytics can also be improved with the use of big supply chain analytics applications as one of the key challenges in these applications is the extensive use of unstructured and semi-structured data. For example, a procurement team sends and receives hundreds of emails to and from suppliers. While doing this, they are likely to refer to various types of product catalogs from web pages to pdf documents. Storing, processing, and analyzing these types of unstructured data sources requires big data technologies such as Hadoop, NO SQL, or Elasticsearch. c.

Make: The make element in SCOR® covers manufacturing operations. One of the most critical factors in manufacturing is resource planning and allocation. In the modern-day manufacturing environment, there are a number of constraints and factors that need to be considered in resource planning in order to ensure supply chain can function. Other than direct constraints such as capacity, labor, raw materials, and stakeholders also need to consider factors such as risk, weather, repair, maintenance, regulatory, and health & safety factors when planning.

Recent developments in Industry 4.0 and the Internet of Things have enabled real-time data generation in a modern manufacturing facility. Utilizing these new data sources to generate resource planning insights falls under the scope of big data. Both predictive analytics and prescriptive analytics are used in resource planning. For example, when scheduling machines, machine learning algorithms are used to predict, when a machine requires repair or maintenance. This information should be used as an input in a constraint-based optimization algorithm used for machine scheduling.

Delivery: This element refers to the order-to-cash cycle in the business. In terms of the material flow, this is where your distribution network becomes important. Big supply chain analytics can be used at different stages in the distribution network. In long-term planning, distribution network design is an application where a comprehensive analysis must be conducted in order to mitigate the sunk cost involved. Designing a distribution network requires visibility over many external factors to reduce uncertainty. These external data sources can include geospatial data, climate data, macro economical data, competitor data, and regulations.

One of the most critical steps in the design process is to predict the long-term demand for a minimum of 3-5 years. Compared to the demand forecasting that was discussed earlier which focuses on forecasting short-term requirements, such as the next month's demand for a particular product, this forecast aims to provide a long-term aggregate demand that allows businesses to identify the capacity requirement of their distribution network. Machine learning can be effectively used to build this type of forecasting model and combined with simulation modeling to assess risk in the design.

Once a distribution network is designed and implemented, the next stage of planning is route optimization. In order to ensure short-term success, a business needs to develop daily or weekly route plans to optimally allocate vehicles to the least cost route. Conventional route planning uses fixed routes and vehicle allocations which leads to underutilizing the network resources. As GPS tracking solutions, real-time traffic data, and other data sources have become more accessible, prescriptive analytics-based dynamic route optimization and vehicle allocation models can be effectively used to increase resource utilization of a distribution network.

There are multiple other applications under the “deliver” element where big data analytics

can be applied. Cost-to-serve calculations, customer service management, and reverse logistics planning are among other popular use cases. Further, depending on the industry a business operates, there may be several other important big supply chain analytical applications. For example, an e-commerce business, which is likely to collect significant amounts of customer behavior patterns. These can be used to improve customer service, reduce cost-to-serve, and improve sales.

To reiterate what has been said, supply chains are a big data gold mine for any business. The amount of value generated, however, depends on how focused an organization can be in generating insights from the data collected.

When they begin collecting such a vast amount of data, many organizations start questioning where to start. When first encountering this, there are several important things that must be remembered. First, even though technology plays a major role in big supply chain analytics, the initial requirement to implement big supply chain analytics should be business-driven not technology-driven. There are several real-world projects that failed to meet the expected value of their business because they were too focused on implementing advanced technology.

Second, implementing big supply chain analytics is a collaborative exercise. Unlike a typical BI exercise where you define the KPIs

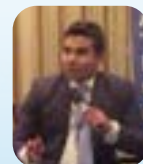
based on the HiPPO (Highest Paid Person's Opinion), big supply chain analytics requires a cross-functional collaboration from supply chain stakeholders, data scientists, data engineers, and your IT team. Only then is it possible to meet the expected business value from the analytics?

Finally, businesses need to prioritize their big supply chain analytics use cases before they proceed to implementation. Use cases should be categorized based on the business value generated and implementation feasibility. Use cases with high value and high implementation feasibility are those that offer the best return and therefore, should be implemented first.

In summary, big supply chain analytics is a broad area to explore and learn. Across the supply chain elements; plan, source, make and deliver there are huge opportunities to generate value by implementing big supply chain analytics. Big data analytics tools and techniques from predictive to prescriptive analytics are used to generate value. However, implementing big supply chain analytics should be a business-driven, collaborative, and well-planned initiative that ensures companies can generate the expected value from their supply chain improvements.

Thisara Watawana

Director, Boffin Institute of Data Science



**ACI Motors****Karnaphuli****NAVANA****RANCON
AUTOS****RANGS
MOTORS LIMITED**

Automobile Industry in Bangladesh

Even a few decades ago, only rich people could afford a car in Bangladesh. But compared to the last decade, the growth of the automobile industry has gradually increased due to the socio-economic development and purchasing ability of the middle-class and upper-middle-class of the country. According to Bangladesh Road Transport Authority (BRTA), 12942 Private Passenger Cars were registered in 2011, and 16049 Private Passenger Cars were registered in 2021. As COVID hit hard in 2020, the registered vehicles decreased by around 21%.

Type of Vehicles	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Upto Feb/22
Private Passenger Car	12942	9220	10456	14681	21029	20268	21952	18222	16779	12403	16049	3123
Jeep(Hard/Soft)	2141	1575	1303	1849	3564	4869	5419	5547	5627	4911	7602	1654
Microbus	4037	3031	2530	4302	5177	5789	5571	4131	3682	2779	4941	1325
Special Purpose Vehicle	391	225	228	174	298	613	994	1334	1179	703	518	64

Table 1: Number of Registered Motor Vehicles in Bangladesh (Year wise); Source: BRTA

However, compared to other Asian countries, the number of passenger car owners is still very low in Bangladesh. Only 2.5 people out of 1000 own a car whereas, in India, about 30 people out of 1000 own a car.

Vehicles per 1,000 Population

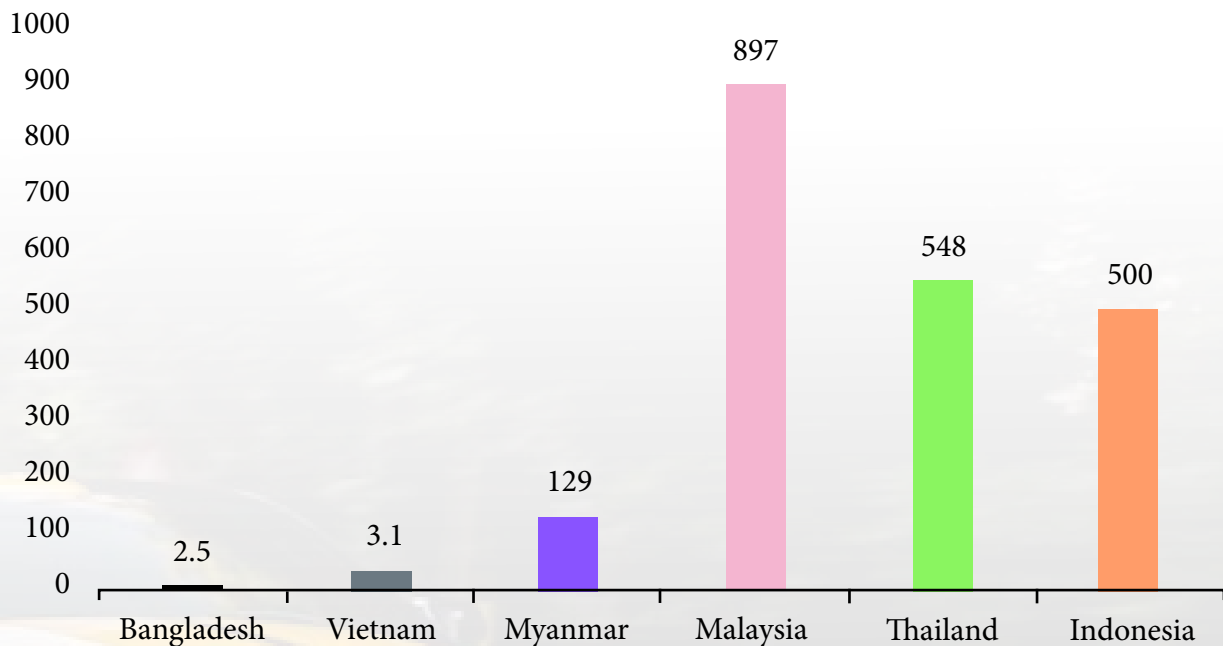


Figure 1: Vehicles Per 1,000 Population; Source: Policy Research Institute (PRI) of Bangladesh

Although cars are not yet manufactured in Bangladesh, many companies have assembled cars.

The first automobile assembly operation was started by Pragati Industries Limited in 1966. They started their journey by assembling trucks and buses of the Bedford company of England. In 1972, the government of Bangladesh nationalized 'Pragati Industries Limited.' They import CKD (Completely Knocked Down) parts from various countries and assemble them in Bangladesh. This plant assembles Mitsubishi brand's SUVs for government officials. In May 2019, Japanese automaker giant Mitsubishi Motors decided to invest \$100 million in Bangladesh to produce its branded vehicles. The company will invest the sum at the Mirsarai Economic Zone in Chittagong, initially for assembling cars, and will gradually upgrade the assembly plant to a full car manufacturing plant. Besides, Indian automotive giants Tata Motors and Mahindra recently showed interest in establishing similar partnerships

with local manufacturers to grab a bigger slice of the growing Bangladesh automobile market. Apart from that, some local private automobile assembling companies operate in Bangladesh, including IFAD Autos Ltd, Aftab Automobiles, Fair Technology Limited, Bangladesh Auto Industries Limited, Bangla Cars, Niloy-Hero Motors, PHP Automobiles, Runner Automobiles, and Uttara Motors Limited. But locally assembled cars have not attracted much market attraction because their build quality is not up to the mark. In 2020, among the newly registered cars, only 2% were locally assembled vehicles.

Bangladesh's automobile market has been dominated by Japanese Reconditioned Cars for a long time. In 2020, among the newly registered cars, 16% were brand new imported, and 82% were Reconditioned Cars imported from Japan. This number has decreased because of the higher tax imposed on Reconditioned Cars import.

Cylinder Capacity (CC)	Import Stage Tariff Rate, 2019-20							Domestic Stage Tariff Rate, 2019-20		
	CD	RD	5D	VAT	AIT	Trade VAT	TTI	SD	VAT	
<=1600	25	3	45	15	5	5	128	0	15	B6
1600-2000	25	3	100	15	5	5	212	0	15	156
2001--3000	25	3	200	15	5	5	566	0	15	284
3001--4000	25	3	350	15	5	5	596	0	15	476
>4000	25	3	500	15	5	5	B27	0	15	668
Electric Motor Car	25	3	0	15	5	5	59	0	15	28

CD=Customs Duty, RD=Regularity Duty, SD= Supplementary Duty, VAT=Value Added Tax, AIT=Advance Incom Tax, TTI= Total Tax incidence, NPR=Nominal Protection Rate

Table 2: Import Stage Tariff Rate for Reconditioned Cars; Source: Policy Research Institute (PRI) of Bangladesh

In addition to the customs and supplementary duties imposed on Reconditioned cars, various other duties and taxes are levied at various rates; Custom Duty (CD) at a 25% rate, Regulatory Duty (RD) at 3% rate, Advance Income Tax (AIT) at 5% rate and Trade Vat (TV) at 5% rate are charged to the importers at the import stage at the port of entry. In addition to these duties and taxes, VAT is applied at a 15% rate at the duty and tax paid value as the base. In total, a total tax incidence of 128%. This is based on a low value of less than 1600 cc car. The total tax incidence may go as high as 827% for cars with engine capacity above 4000 ccs. By any consideration, the overall duty/tax incidence on imported cars is outrageously high in Bangladesh. However, the popularity of reconditioned cars remains strong. These Reconditioned Cars are mainly called JDM (Japan Domestic Market) cars. The JDM cars are popular worldwide because of their Quality, Durability, and Reliability. Though there are options for Brand-New Cars

from China, Germany, India, Malaysia, South Korea, Thailand, the UK, and the USA, most people in Bangladesh prefer to buy Japanese Reconditioned Cars because of their Quality and higher resale value.

SUVs or JEEPs have always been available in the Bangladeshi market. But their use was limited to government officials and important corporate personnel. In recent years, following the global trend, SUVs are becoming popular among middle-class buyers too. A sporty look, higher ground clearance, ease of driving in Bangladeshi road conditions, and affordable options are the main reasons for this. Some popular JDM SUVs in Bangladesh are Toyota Land Cruiser Prado, Toyota Harrier, Honda CRV, Nissan Xtrail, etc. Chinese brands like DFSK, MG, and HAVAL are also bringing affordable SUVs.

Along with SUVs, Hybrid vehicles in the Bangladeshi market are growing significantly.

This growth may replace much of fossil fuel vehicles in the next five to ten years. People were reluctant to buy hybrid cars in the past due to lack of knowledge, unavailability of parts, and expert technicians. But with time, acceptance has increased due to a lower tax rate, affordable prices, authorized dealers, and service centers. Toyota Axio, Toyota Fielder, Toyota Aqua, Toyota CHR, Toyota Prius, Honda Grace, and Nissan X-trail are some of the popular hybrid models in Bangladesh.

A non-hybrid 1500 cc car can run 7-10 KM/liter, while a hybrid car with the same cc can run almost 15-25 KM/liter. In addition to engines, Hybrid cars have motors that provide extra BHP (Brake Horse Power) for the car. So, hybrid models provide extra power compared to gasoline versions of similar cc cars. As a result, hybrid cars have lower cc import duty rates but provide power similar to higher cc cars.

Car CC (Hybrid Car)	Previous Supplementary Duty	Revised Supplementary Duty
1500	30%	25%
1501-2000	60%	45%
2001-3000	150%	60%

Table 3: Changes in supplementary duty on hybrid cars; Source: National Board of Revenue

Following the hybrid cars, Electric Vehicles (EVs) are also entering the Bangladeshi market. Electric Vehicles are vehicles that are totally fueled with electricity. EVs are usually cost-efficient and greener compared to Internal

the vehicle's internal combustion engine. An official of the power department calculated that a petrol-powered car costs Tk 5,365 to cover a distance of 1,000 km. An electric car at the same distance will cost 1,250 Taka. That



means electric cars are much more affordable. And because it does not produce smoke, it does not pollute the environment.^[1] Electric cars already have the lowest TTI in Bangladesh among all imported vehicle categories at 59% [Table 2]. But again, unavailability of charging facilities on roads, inadequate power supply, unavailability of spare parts, lack of expert technicians, and poor quality of roads are some of the road bumps ahead in the adoption of EVs. But Bangladesh is

Combustion Engine (ICE) vehicles, which run on fossil fuels such as gasoline that heat

now nearer than ever to joining the global trend of switching to electric vehicles to save the



environment and cut costs. The government is currently formulating policies to promote wide-scale EV deployment. Bangladesh Road Transport Authority (BRTA) is working on a draft policy to expedite EV import, domestic manufacturing, and EV registration. Automobile Industry Development Policy 2021 is in place that talks about a 10-year tax holiday, financial incentives, interest waivers on loans for local manufacturing, and assembly of EVs.[2] Several large corporates have announced their plan to establish local EV manufacturing plants. Bangladesh Auto Industries Limited (BAIL) is setting up the country's first-ever electric car plant on 100 acres of land in the Mirsarai Economic Zone. They are planning to manufacture all sorts of vehicles starting from two/three wheelers, sedans, hatchbacks, SUVs, and pickup trucks. Nitol Motors is also setting up an EV assembly plant with the brand name "Suvare" in Ishwardi. They will assemble sedans that can cover 200 kilometers with just half an hour of charging. The government is also planning to introduce EVs in the public transportation system. Bangladesh Road Transport Corporation (BRTC) has

already taken the initiative to introduce 50 electric buses that will run on long routes like Dhaka-Chattogram.

The automobile industry of Bangladesh has developed a lot since 2000. But there are a lot of things to achieve yet. There must be a level playing field for everyone. Import of Reconditioned and Brand-new cars should be eased and continued. A variety of options should be available for the customers. Also, local companies should try to manufacture good quality cars to compete with the existing market. If we really want to have a vibrant domestic car industry, then we should be export-oriented and forward-looking. By overcoming the major challenges stated in this article, we might see "Made in Bangladesh" cars in other countries after fulfilling the country's local demands.

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Let Our Labor Law Be Digital Bangladesh Friendly

What I am going to discuss in this article is not from an expert end rather, I am trying to focus few points here from a user experience. Bangladesh Labor Law is still in the development process. The state did not declare the Labor law mandatory for every organization. There are different categories of sectors in Bangladesh. I have worked for Development organizations, Govt. organizations, and also in private sectors as well. Except for the government organizations, all private sector organizations practice as per their own company policies.

Being a Human Resource Professional, I have experience working with policy development for my organizations. From that perspective, I felt our Labor Law needs to be updated and adopted. Still, our laws are not Digital system friendly. We have declared our country as Digital Bangladesh, and the Bangladesh government is also emphasizing on digital service system in every sector. Even in Govt. the sector, the traditional approval process has almost vanished. Ministries are issuing

circulars to bring every approval process under automation. In the private sector, automation has started for a long. The manual filing system is outdated. Almost every organization, irrespective of the size of the employee, is now under automation, and everybody is trying to maintain data through the system (HRIS). But the irony is that our labor law still does not accept this automated database system. Still, the govt authorities from different departments are visiting the commercial offices and charging for manual service rules, register books like attendance register/leave register/overtime register, etc. I am not demanding that 100% of organizational processes are digitized but what I am trying to say is that our state rules and policies should acknowledge digitalization too. It is humanly impossible for an organization with more than 100 staff to manually maintain every record regarding employees. Considering the time, energy, maintenance, security, and authentication, manual record-keeping is the most costly manner.

Unless or until our mindset is changed, the system will not be changed. Bangladesh as a country is moving so fast. Our economy is now booming. Our Economic model is now recognized as an example by the world.

employers are empowered, and employees are deprived in many ways. Once our Laws are capable enough to uplift employment rights, our job market will also e in the system.



Economic advancement should be associated with modern technology, which we already have achieved a lot. There is a lack of coordination among the sectors. What we need is good coordination of technology and mindset. At the same time, revision of the policies and practices. Otherwise, it is creating a disruption for the private sector. I agree we cannot change all overnight, but we need to start the process. So many countries are 100% governed by their Labor laws. I believe Bangladesh will also in the coming days. Right now, different sectors are operating their systems in different ways. There is no synchronization. This is why our

So, our demand to our government is to acknowledge the digital and automation system in our Labor Law. At the same time, our government authorities should also be mentally and physically updated.

Aleya Pervin Leena
Head of HR at Agora Limited





Digital Transformation: Optimizing Supply Chain Drivers

1. Introduction

The application of digital capabilities to processes, goods, and assets to improve efficiency, provide customer value, manage risk, and navigate through new income creation opportunities is known as digital transformation. This is a worldwide transition that necessitates the adoption of digital technology for both internal and external activities, including sales, marketing, and support. Companies must fundamentally restructure how they function, accept cultural change, and reconsider their status quo in order to adapt. The transformation and exploitation of new business strategy possibilities require digital talent and competencies. The post-pandemic environment we now inhabit is fostering a digital fever mindset. Companies that build smart experiences and customer journeys that facilitate and/or complement people's lives will prosper. Companies that fail will be those that do not attempt to profit from emerging AI technologies and do not use data to predict demand patterns and make workforce-improvement decisions. 90% of businesses

are now operating in the cloud. Many firms are replicating old services in a digital version as they shift data to the cloud. On the other hand, true digital transformation entails much more: The creation of a technological framework to funnel these services and data into actionable insights that can enhance just about every aspect of a business may be revolutionary for a digital transformation.

Every supply chain has three basic elements: supply, demand, and logistics. If one of these is affected, it can lead to broad disruption throughout the supply chain. Supply, demand, and logistics are all facing disruptions in global supply chains right now. Due to COVID-related closures and lockdowns, factories have been functioning at a fraction of their full capacity (Paul et al., 2021). Never before have the stakes been so high to ensure timely and effective execution of projects with a proper marriage between project management and supply chain considerations. The research direction of considering integrated material ordering and project scheduling under a

resource constraint situation has recently attracted scholars' attention (Asadujjaman et al., 2021a). The fundamental concern of this integration is to select the right supplier of the right material by placing an order at the right time so that the materials' ordering, purchasing, and holding costs are minimized, which finally maximizes the project's profitability. A new method for selecting suppliers was addressed in Mohammadivojdan et al. (2021); however, they did not include characteristics of multi-project scheduling and resource transfer time. Recently, I, along with one of my PhD students, developed a new model (Asadujjaman et al., 2021b) by considering material ordering and project scheduling characteristics with discounted cash flows. Notwithstanding, none of these existing approaches has considered both supply chain drivers and project schedule attributes (e.g., supplier selection, make or buy decision, subcontracting or overtime option, project compression or project crashing, inventory handling, number of orders, lead times, supply uncertainty, lead time uncertainty, product availability, etc.) together for complex and high-dimensional multi-project environments. Considering these, this article will explain the need for a digital transformation via integrating both supply chain and project management concerns.

2. Why do we need a Digitalized Integration?

The need for a digitalized integration can be explained in two ways; the need for an integrated digitalized framework and the need for a robust framework that can handle uncertainties and risks and better understand ambiguous information.

a) The need for an integrated framework

Meanwhile, project schedule has been considered one of the critical tasks in project management, which predominantly assumes scheduling project activities by satisfying precedence and resource constraints. By virtue of proper project scheduling, a project manager can determine the timeline, allocate resources, plan for the budget,

and, most importantly, get a sense of the reality of delivering the project (Chakraborty et al., 2019). Nevertheless, blaming the COVID-19 epidemic and its subsequent impacts, traditional project management, and scheduling are now characterized by volatility, uncertainty, complexity, and ambiguity. Thus, to sustain Australia's economic growth and remain competitive in the new reality, it is vital not to cancel but to optimize affected or vulnerable project portfolios (Chakraborty & Ryan, 2020). To do so, embedding business reforms, speeding the digital transformation of classical projects, and implementing advanced technologies and automation programmes (e.g., artificial intelligence-based approaches) in supply chain and project management problems can encourage better business agility, which is potentially the shortcomings in the current literature (Rahman et al., 2021). Moreover, in practice, while scheduling the activities of multiple projects in dynamic environments, project managers face challenges that are typically due to the lack of timely, accurate, and consistent information, finite resource transfer times, and interdependencies among activities of different projects; and uncertain activity interruptions. Therefore, to avoid such shortcomings, an integrated framework that considers both project management features and supply chain drivers, advanced solution approaches, and better ways of dealing with uncertainties (e.g., artificial intelligence-based) can lead to an optimal decision support system for the whole business. Despite a few discussions on the coordinated supply chain and project schedule frameworks in the construction industry, there is an unfortunate dearth of existing work in the literature that considers detailed project schedule characteristics (e.g., activity, resource usage, resource availability, resource transfer times from supplier to project manager, makespan, etc.) during potential supplier selection.

b) Shielding against Known Unknowns and Unknown Unknowns

Inarguably, due to mass customization, volatile

market demands, and sudden supply chain structural changes (e.g., due to the COVID-19 pandemic), traditional ways of dealing with supply chain management and project scheduling have changed dramatically. Now, the 'unforeseen' and 'unknown unknowns' are prevalent, which led to data ambiguity, parametric uncertainties, and data dynamicity. However, there is no careful planning to

project scheduling domain. Moreover, how a combination of data/information ambiguity and a decision maker's lack of confidence can be incorporated into a proactive mitigation strategy is another untouched and cutting-edge research direction. Unlike data ambiguity, data uncertainty and data dynamicity have been well-considered in the RCPSP and SCM literature. However, consideration of data ambiguity, parametric uncertainties, and data dynamicity in a single complex and embedded framework has not been introduced in the literature lies a significant research gap in this domain. While the whole country and its supply chain ecosystem have been affected in such penultimate time, there is no proper decision support system to embed supply chain considerations in a project framework. Therefore, more research is needed to bridge the gap between project management and supply chain management to address these shortcomings. Defining an efficient supply chain embedded project scheduling problem (SCEPSP) and its parametric analysis, and consequently designing an advanced evolutionary algorithm for solving the deterministic **SCEPSP** can be an important research direction. That deterministic model should further be extended to deal with data/information ambiguity.

c) Some major trade-off issues related to the Integrated framework

Resource Buy or Hire: For example, let assume you need to bring one lathe machine from Dhaka to Mymensingh, while that lathe machine will only execute 2 to 3 activities. Now, as a project manager, two binary decisions need to be taken: (i) should we need to bring that Lathe machine from Dhaka, or (ii) should we buy that one and place it in Mymensingh. There will be a high acquisition cost in the second option, affecting the overall supply chain cost. On the other side, if someone picks option 1, he may need to wait for that machine to come instead of paying subcontracting costs. And others. You may also think about resource

tackle the current literature's 'unforeseen' and 'unknown unknowns' while designing an integrated project framework. Although there is a very small number of attempts to tackle such ambiguity in the project management domain, there has not been any attempt to apply such methodologies in a supply chain embedded

holding vs not-to-hold option. If that lathe machine is needed for multiple activities, then the second option may be better. So, based on the number of activities, resource demands, and relative position in a project schedule, we need to take this resource to make a buy or hire decision.

Resource Transfer: Let's assume a machine needs to be carried to the point of execution for the relevant activity, while we need to consider resource transfer time, how many we are transferring, which transportation mode (e.g., truck, UAV) are we using and how frequently are we transferring those resources. We need to derive an equation representing all these factors to calculate transfer delay, which then will be added to activity duration. Meanwhile, we will also calculate cost parameters too. Multi-objective optimization techniques (minimize cost and maximize profit) should be more appropriate, which will also be my future direction.

Whom distribution centre or third-party to pick: Say, one (or Q-number) lathe machine can

be a procedure or subcontracted or brought from Dhaka but from three different parties. Now, another strategic decision is to decide whom to buy or subcontract. If we can allocate this decision parameter and just resource acquisition or transfer, this may also lead to a good research spectrum. So, we should amalgamate at least two of these features in the supply chain integrated project scheduling framework.

3. A possible look for the integrated framework

Like any other work, to implement and define, at first, the initial model, a decision-maker should filter out some fundamental assumptions. These assumptions can help them to shape the scope to avoid any overfitting and ambitious tensions. Some of the fundamental assumptions can be:

- The initial focus is on the supply chain incorporating suppliers, raw material warehouse (i.e., cross-docks or distribution centres) and the location for project execution
- The warehouse or distribution centre is geographically dispersed

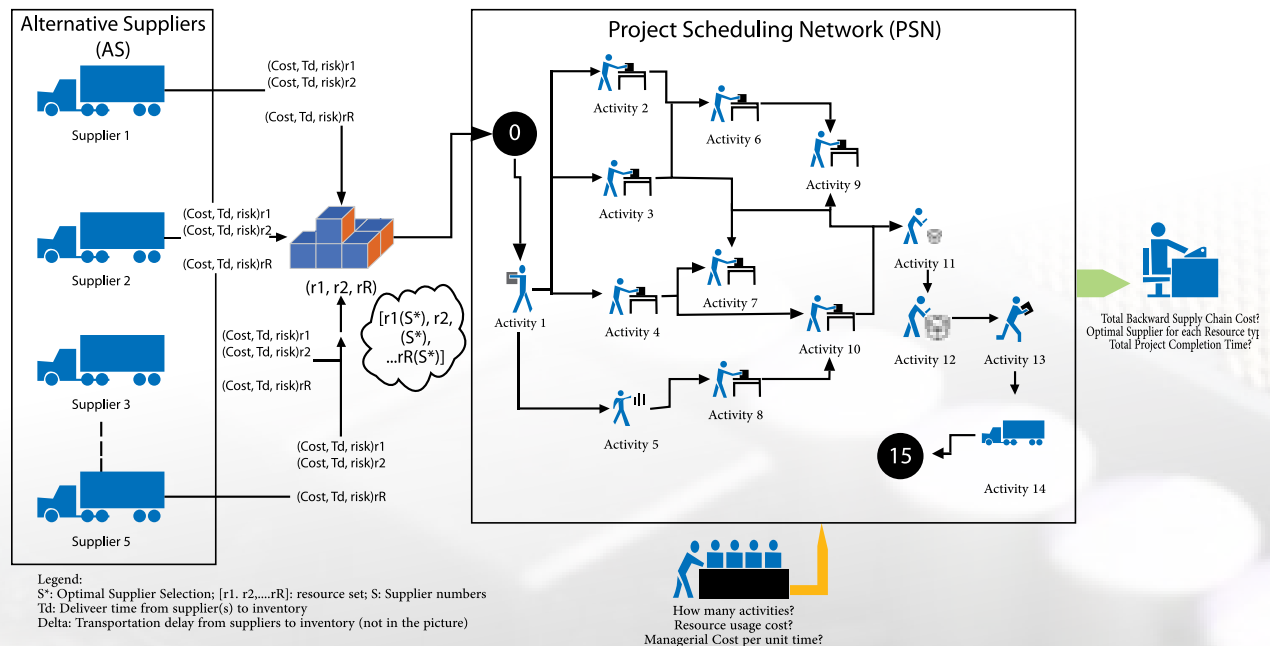


Fig 1: The overview of the Supply Chain Embedded Project Scheduling Problem (SCEPSP)

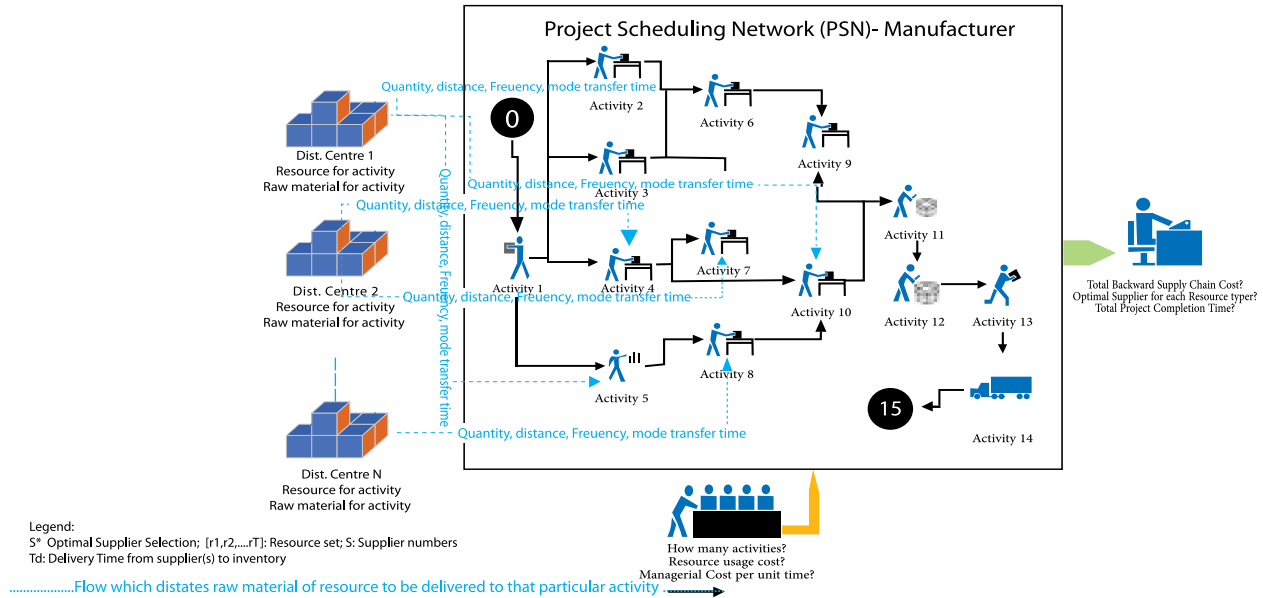


Fig 2: SCEPSP extending from distribution centres to manufacturers

and should have “X” units of distance while carrying resources or raw materials T_d should take amount of time.

- Lead time to delivery should be considered
- Resources are only renewable type, i.e., they will resume their original capacity once released by the occupied activity (e.g., machine, manpower)
- Raw materials are non-perishable and non-fragile. They should be in a lot and customized based on the demand patterns of activity from the project scheduling network
- All orders are placed at the same time for the same type of product to the same supplier. Here, we are avoiding order-lot complexity, which can be another possible extension.
- There is no dependency on the raw material delivery patterns. Therefore, a selected supplier can deliver all resources at the same time, depending on his truck capacity and availability
- The first shot does not explicitly consider how much to store in the distribution centre. This can also be a future extension, while we will propose strategies to minimize inventories or optimize the number of orders or delivery. A simplistic representation of these parameters can also be

welcomed, if possible.

Figure: 1 highlights the overall framework of the proposed robust SCEPSP, while Figure: 2 demonstrates key supply chain considerations within distribution centres to the manufacturers. Although the initial interpretation of this proposed SCEPSP relates primarily to manufacturing environments, this is just a generic representation. This model should be robust enough to fit any real-life manufacturing or construction projects. Here, both supply chain drivers and project attributes (for example, supplier selection, make or buy decision for a resource, subcontracting or overtime option, project compression or project crashing, inventory handling, number of orders, lead times, supply uncertainty, lead time uncertainty, product availability) will be considered during the development of this embedded problem. Figure 1 depicts a pictorial view of the proposed SCEPSP. This proposed model will consider multiple projects and will integrate information and material flow across multiple suppliers, distribution centres, retailers and customers.

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Enhancing Industry-Academia Collaboration in the Supply Chain Sector

Bangladesh has passed all the benchmarks to graduate as a developing country by 2024. It is strategically located with maritime access as the gateway for landlocked regions of Northeast India, Southwest China, Nepal, and Bhutan. The country has shown a strong economic growth rate of around 7% over the decade. Even during the Covid-19 pandemic, the country has shown greater resilience than most countries. The bulwark of future growth of the country is expected to be the supply chain and logistics sector. However, the key question that needs to be asked is, “Are we developing quality graduates in supply chain and logistics that can meet the demand of the future?” The answer, unfortunately, is negative. A supply-demand imbalance in terms of quality human resources will bog us down in the future. The sector that is responsible for the supply of quality human resources is the Higher education sector or universities. In

total, 53 public and 107 private universities in Bangladesh (UGC 2020). Private universities in Bangladesh came into being after the institution of the Private University Act of 1992. Bangladesh has made commendable progress in enrollment in higher education institutions, and it has been predicted that this will continue to grow as the share of the youth with tertiary education is expected to increase (World Bank 2019). Total enrollment in the local higher education institutes increased to 3.96 million in 2017.

Despite the commendable economic development, there appears to be low labor productivity, unemployment, and underemployment due to a lack of overall adequate quality among our graduates (Rabbani, 2016; UGC, 2018). To solve this problem, there is no alternative to industry-academia collaboration.

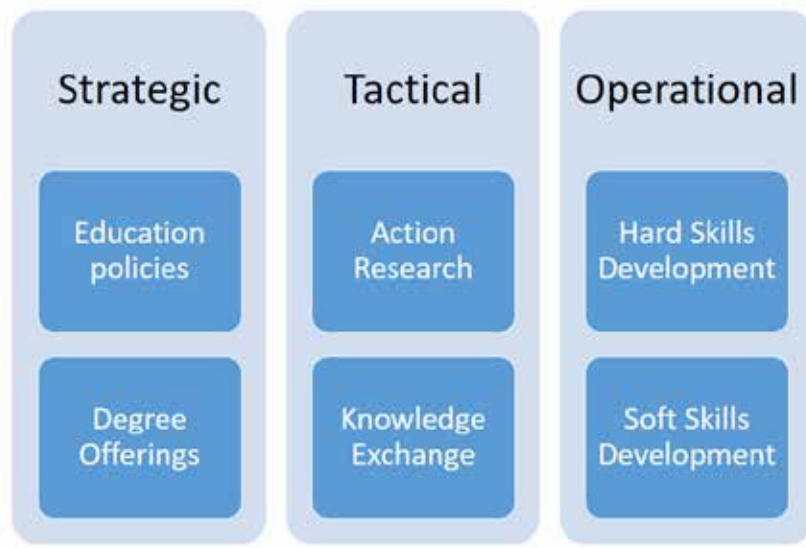


Figure: Framework for enhancing industry-academia collaboration in supply chain

Framework for enhancing industry-academia collaboration in supply chain

This article proposes a framework to enhance industry-academia collaboration in the supply chain and logistics field in Bangladesh. The framework has three pillars, namely 1) Strategic, 2) Tactical, and 3) Operational. Each of the pillars consists of two elements.

Strategic

Policy: Bangladesh Government introduced the National Education Policy in 2010 (Ministry of Education, 2022). Objective 4 in the national policy states, “To adapt higher education with the realities of the country in all possible areas and to identify the problems of the society and state and to find solutions to them.” This implies that government strategy is right to focus on applied education/discipline like supply chain management, keeping in mind the industry, societal and national needs. One of the cornerstones in implementing the objective is improving the quality of higher education to reduce unemployment. Hence, a four-year bachelor’s degree was fixed in this policy as the acceptable higher educational qualification for most disciplines. However, despite the timely policy adoption, it has yet to translate to an increase in the overall

quality of education that fresh graduates exhibit. This means authorities must go far beyond setting policies and focusing on implementation. It is perhaps the right time to facilitate the establishment of technical universities focusing on the supply chain domain. Furthermore, private stakeholders should also be encouraged to set up technical universities related to supply chain and logistics. In the

context of Bangladesh undergoing a massive transformation in infrastructure and connectivity, specialized universities in applied sciences such as logistics and supply chain will ensure that the country has the necessary skilled human capital to sustain the transformation.

Degree Offerings: The higher education institutions in Bangladesh offers degrees in various discipline. The range of degrees offered is particularly varied in public universities, which ranges from domains such as arts, sciences, law, medicine, social sciences, business studies, biological sciences, environmental Sciences, engineering and technology, education, etc. These universities offer a variety of degree programs, including Bachelor’s and Master’s. In addition, private universities also offer degrees at the master’s and bachelor’s levels in domains such as social sciences, business, engineering, and science and technology. It should be mentioned that most of the students enrolled in programs in private universities are in faculties such as science, technology, and business administration. Most students studying business in private universities are in bachelor’s in business administration (BBA) and master’s in business administration (MBA) programs at undergraduate and

graduate levels, respectively. These degrees teach and train students in generalized business areas with some courses as part of major concentration in areas such as supply chain, finance, marketing, etc. For example, if a student studies BBA with a major concentration in supply chain management, he or she needs to complete around six courses related to supply chain. Degrees such as BBA and MBA are appropriate for producing graduates who can contribute to different functional areas in an organization, but the current business landscape of the country demands that universities also focus on producing more specialists in applied areas. Universities should consider offering Bachelor's and Master's in Science degrees in supply chain management and logistics-related discipline. University



Grants Commission (UGC) should encourage and facilitate universities to undertake such programs.

Tactical

Action Research: The country's march towards materializing its vision of 'Digital Bangladesh' has brought impressive growth, but there is a long way to go to meet our goals. Organizations need to develop competitive advantages through innovation and research in the current knowledge-based society. This is particularly true for applied areas such as supply chain management. The mandate for innovation and research falls in the purview of universities. The beneficiary of such research is

expected to be the industry partners. However, academic researchers have limited funding available to conduct effective and meaningful research that can benefit the industry. The results of the limited research that is conducted are most often not applied by the industry. This is primarily due to the lack of synergy and absence of a research ecosystem between universities and industry. Industry stakeholders, including organizations in the supply chain domain, must seriously realize that native and localized solutions through research and innovation will be key to future success and primary enablers of competitive advantage. The ready-made imported solutions may be adequate in the short term but cannot meet the demands of the future when Bangladesh is expected to be a developed country. The supply chain and logistics industry must show foresightedness and invest in research programs in partnership with universities. In this regard, action research should be pursued in the supply chain domain. Such research has evolved over the years and can be defined as "orientation to knowledge creation that arises in a context of practice and requires researchers to work with practitioners" (Bradbury-Huang, 2010). Hence, such research endeavors are likely to solve problems faced by the industry and will have a much wider scope of impact.

Knowledge Exchange: The key to successful collaboration between universities and industry is a mechanism for information and knowledge exchange. A university-industry landscape involves multiple stakeholders with multiple, and often contradicting, objectives and organizational mindsets and cultures. At the same time, it has become clear that universities need to play a more dynamic role in their relationship with the industry to create market-ready graduates. The onus is also on the industry to develop channels for knowledge transfer. To materialize such knowledge transfer, trade bodies such as FBCCI, DCCI, etc need to play an active role. The trade bodies can create sub-committees to investigate and promote affairs of knowledge

transfer with universities. The trade bodies should encourage their member organizations to engage with universities actively. There should be regular interaction between university management, policymakers, and industry representatives through seminars, conclaves, and symposiums. The university authorities should pay heed to the industry's demand and develop course curricula and teaching methods based on the industry's requirements, especially for applied subjects such as supply chain management. It should be mentioned that there are encouraging signs of greater interaction between industry and academic institutions, as seen by signings of MOU etc, in recent years. Unfortunately, many of these efforts run out of steam after the initial phase and do not materialize into tangible benefits for either party. To mitigate such problems, trade bodies, interested industry partners, and academic institutions should assign specialized staff and contact points to manage the process and relevant resources.

Operational

Hard Skills: Universities should focus on imparting hard skills to their students, such as specific abilities or capabilities that individuals need to flourish in supply chain-related jobs. These are solid skills such as using tools in project management, technical understanding of supply chain and procurement process, analytical and presentation skills, etc. These can be done through teaching based on real-life case studies and extensive training on relevant tools. Unfortunately, there is a lack of quality case studies based on the local context in Bangladesh. Quality case studies and educational materials focused on the Bangladesh context can only be materialized with active collaboration and participation of academic institutions and the industry. Furthermore, universities should make

available relevant software and tools used in the industry to their students and emphasize developing students' proficiency in these tools and software.

Soft skills: Graduates also need personal qualities that will help them thrive in the workplace. These skills include communication, teamwork, coherent and logical thinking, managing time, leadership, self-confidence, quick thinking, and most importantly, willingness to learn. Universities need to introduce their students to the corporate world not just through internships at the end of a degree but rather gradually during the degree. This can be done through industry attachment, placement, study tours, casework, etc. However, this is not possible without the active support of the industry. It is unfortunate that there is often reluctance among some organizations and managers to mentor and provide opportunities to students to learn. This mindset needs to be abandoned considering the long-term benefit and overall value addition to be made by students in the future.

Conclusion

Famous American writer and publisher Elbert Hubbard once said, "One machine can do the work of fifty ordinary individuals. No machine can do the work of one extraordinary individual." This is true in the context of the available quality of human resources in Bangladesh. If Bangladesh as a country is to reach the lofty goals of being a developed country within this century, the supply chain and logistics have to perform the role of the engine that drives it. For that to happen, we need quality graduates in the supply chain and logistics field. This means greater industry-academia collaboration, as explained in the framework proposed in this article

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Are We Practicing the Right Supply Chain in Construction Industry?

Supply Chain Management is the most heard/ written/ spoken three words in the current business world. Lockdown during the Covid-19 and post-Covid global logistics crisis increased focus on this key business function.

In Bangladesh, structured supply chain management is very common in industries like FMCG, Pharmaceuticals, and Garments, which cover a significant portion of our economy. However, till now, it lacks in construction industries primarily due to its defined life cycle. The construction of buildings, tunnels, roads, bridges, railways, power plants, airports, flyover, metro rail, EPZs, and many infrastructure developments are ongoing in our country like never before. Many foreign companies, as well as nationals, are also working on ongoing mega projects. All kinds of modern state-of-the-art construction equipment are now available in the Bangladesh construction industry and are currently engaged in different projects. Despite manifold increases in construction projects across the country, proper supply chain management seems to be standing at

a distance. The primary focus of Companies executing these projects is on purchasing at the lowest.

Numerous construction projects in Bangladesh contribute significantly to the economy, and this trend is expected to follow in the coming years as well. 10 mega projects, road and bridge construction across the country, and government investment in multiple infrastructure projects are key places to implement construction supply chain management. The approximate budgeted amount for ongoing mega projects - Rooppur Nuclear Power Plant (BDT 113,092.91 crore), Matarbari Ultra-Supercritical Coal-based Power Plant (BDT 35,900.84 crore), Metro Rail Line-6 (BDT 21,985 crore), Third Terminal of Shah Jalal International Airport (BDT 20,598 crore) are financed by both Bangladesh govt. and foreign countries. Bangladesh govt. expects to get into an agreement with the Japan International Cooperation Agency (Jica) to get USD 2.80 billion within the Japanese fiscal year 2021.

On the other hand, in our country, projects are always far behind the completion deadline; there is an example of 36 months project which was later finished after 120 months due to materials shortages, lead time variation, resource availability, and so on. An extension of the project timeline often results in an additional budget. Though, efficient logistics management could bring down the project cost by 10% to 17%. For the last ten years, many companies have developed and introduced an in-house management system that only acts as a purchase management system. Some are linked with the inventory/ store/ warehouse. The

system and top management are missing the main benefit of total supply chain management.

Basic Supply Chain for A Construction Project

If we consider the right operational approach for any construction project from small to large, **E2O** - engineer-to-order would be the right one. Engineer-to-order requires unique engineering design and significant customization, which we can relate to any construction project. Construction starts with a design followed by completion of the works as per the requirement of the customer/ client.

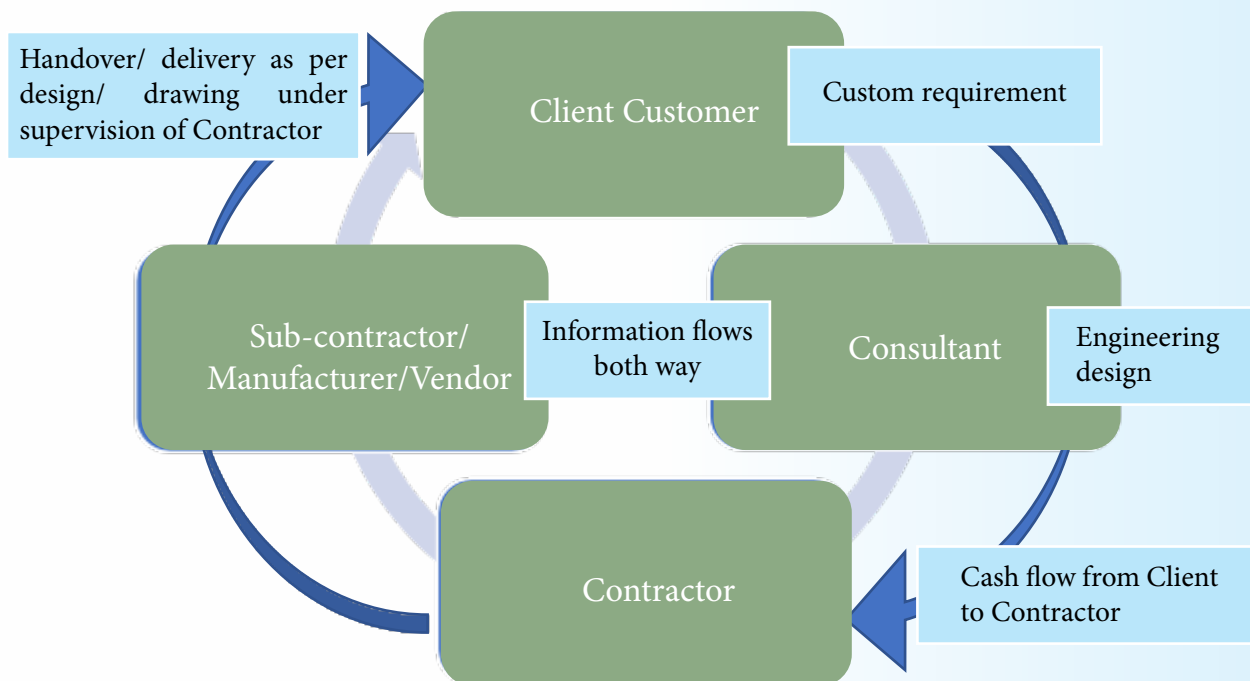


Figure 1: Basic supply chain for a construction project

The above figure is a preliminary idea of how the construction project environment runs. Initially, the client/ customer will specify the requirement, and the consultant will prepare the engineering design/ drawing and take approval from the client. The main contractor will allocate the required manpower, equipment, and machinery along with the sub-contractor (where applicable), manufacturer/ supplier/ vendor,

and supervise to carry out of the construction as per the approved design/ drawing. During execution, information flows both ways - the client specifies the requirement to the contractor through the consultant and carries it out accordingly by the contractor through sub-con/ supplier/ vendor. This goes reverse as well; sometimes, the required product/ design might have some constraints during

execution or be unavailable at the market. This information is then passed to the client through the contractor for further changes. Regarding cash flows, as per requirement, whenever part or full construction is being handed over to the client, payments are made to the contractor, and the contractor pays their sub-contractor/ supplier/ vendor.

Other than the client, consultant, contractor, sub-contractor/ manufacturer/ vendor, there are many stakeholders in a construction project. Starting from the engineers/ resources involved, the community people/ places where the construction is ongoing, the local law enforcement authority, and government authorities who look after the different kinds of utilities like water, electricity, etc. – all are project stakeholders. Most importantly, which is often neglected in our country, is the environment. During construction, water, air, and sound/ noise pollutions are very common, but no measures have been taken to mitigate these issues. The practice of reverse logistics or recycling or responsible use of natural resources is still missing around the construction site.

Supply Chain Functions in Construction Industry

There are many functions of the supply chain involved in construction projects. However, in our country, procurement is primarily focused on the supply chain operation. Other functions which are also integral to construction are not well organized and formalized yet. The supply chain function starts with the requirement raised by the concerned technical/ user department. Followed by sourcing of that particular product/ service – procurement – transportation – inventory are several functions that are also crucial to the construction project. There is another important commercial function; if any product is required to import from a foreign country, then commercial takes the necessary steps to carry out the task.

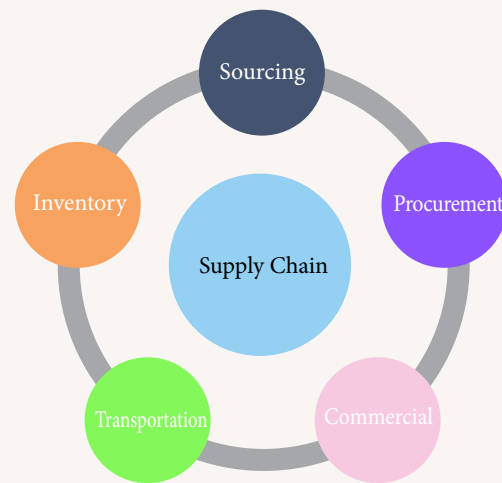


Figure 2: Supply chain functions in construction industry

Based on the requirements, products/ services are being sourced considering the specifications. After getting preliminary source confirmation, the procurement function jumps in to ensure efficient purchase at optimum cost. Procurement approaches like Request For Quotation (RFQ)/ Bidding/ Open Tendering are seldomly followed in construction projects. The subsequent process for selecting the right vendor in terms of low price, desired quality, lead time, and payment terms is given less priority than it should have. After procurement, products are delivered at the site and received by inventory/ store. During delivery of the item, transportation is arranged by the client/ supplier depending on the contract's terms and conditions. On the other hand, during sourcing, if any product is required from abroad, commercial steps in, communicate with the supplier, calculates preliminary import duties, communicates with the C&F agent, and takes necessary actions to import the required products.

Often the construction site/ project faces numerous challenges due to the lack of best practices in supply chain management in the industry. Materials shortages, poor quality of materials, poor workmanship, and excess materials post completion – are very common

bottlenecks a construction site/ project faces daily.

Components of Efficient Supply Chain Management

Now if we look at the basic components of supply chain, we will find that below components are at the core of the process.

Planning: Planning is an essential element of supply chain management. The purpose is to manage and plan resources to produce/ provide products and services as per the requirement of customers.

Sourcing: Identifying the key products with origin, finding the right source for the desired product/ service, finding right supplier at right price are the main consideration in sourcing.

Inventory: Inventory refers to all the items that are in stock and considered as major expenses of a company. Inventory includes raw materials, finished goods and materials/ product required to provide the expected service. Inventory in construction industries also include equipment and machineries, those are used in the project/ site construction.

Making / Construction/ Execution: In this stage, all the supply chain components are in sync to produce/ make the desired product/ service. Production/ service schedule, inventory availability, required manpower and capacity are kept in balance to maximize the required production/ service.

Delivery/ Transportation: During procurement of materials/ products and after production, transportation plays a vital role in the supply chain. Without transportation, supply chain has got no value. Transportation is required in every single stage of any supply chain. From raw materials to warehouse, then to manufacturing unit and after production from warehouse to distributors, retailers or customers – in each segment transportation plays a crucial role.

Returning: If customer wants to return the product after delivery, supply chain should

have the adequate infrastructure to receive. Sometimes the product might need some repair works, if its within warranty period. Returned product could be remanufactured/ recycled and could be ready for resell in the market.

Benefits of Efficient Supply Chain Management In Construction Industry

Increase Profitability: Getting more profit is the key benefit of practicing supply chain management in construction industry. Profitability can be increased through ensuring integration and communication between all stakeholders, sharing technical as well as real-time information on market prices or services, which will help the management to adjust the budget beforehand.

Lower Equipment Maintenance Cost: Supply chain planning will offer lower equipment maintenance cost, as the planning will be derived considering the master schedule. According to master schedule supply chain professional can plan the work distribution / engagement of construction equipment for designated work.

Price Benefit On Material/ Product: Supply chain material planning will help to determine when to purchase, from where and the purchased quantity. If there's planning - material/ product forecast could be shared with strategic supplier and economies of scale could be achieved during procurement contract.

Responsible Usage of Material/ Product: In order to keep inventory accounting record accurate, the usage of material/ product will be optimized and requisition for site use will be more at actual.

Product/ Service Quality Improvement: Supply chain management always considers integrated operations between stakeholders and feedback from end customer, hence before receiving the product, the technical team along with concern stakeholder can give their feedback on the quality of the products/ raw



materials. This is also applicable for the service as well; customer can give their feedback during final inspection.

Optimization of Transportation: During sourcing, which transportation mode will be most cost effective for the project that need to be determined. This is also correlated to lead time/ timeline as well as FTL/ LTL, all are closely associated with the cost of the transport.

Strategic Supplier/ Vendor/ Sub-Contractor Development: Supplier relationship management which is one of the parts of supply chain management. Building long term relationship and development of strategic supplier/ vendor will bring cost efficiency as well as quality of the product/ service.

Reduce Waste and Reuse: Supply chain management deals with environmental considerations by reducing usage of natural resources, using low hazardous materials, use of non-toxic substances in construction works. Construction sites use various types of

equipment and machineries which require fuel, usage of fuel is also regulated as fuel inventory is responsible to monitor the receiving and distribution. Reduction of wastages of raw materials like cement, rebar etc. are closely monitored. Various types of hand tools, small equipment and machineries are reused often in a construction site.

All the benefits of supply chain management will result in overall profitability of the project. Development of long term strategic supplier/ vendor eventually results in cost reductions.

Implementing Efficient and Effective Supply Chain Management In Construction Industry

Understanding the needs and impact of supply chain management in construction project. Determine and adopt the right supply chain management process for the construction works.

Finalizing the stakeholders in the process, starting from supplier to client. There should



be an organizational structure which will help to determine the operating procedure in the project.

Technology or ERP software system should be introduced. It will help management to get all data in a single place. These types of integrated system could be customized based on the nature of the project. And all stakeholders can give their input ranging from quantity requirements till receiving of raw materials at inventory, this system should bring the transparency and visibility of the materials' status real time.

Supply chain awareness session should be conducted among all stakeholders. How the supply chain management will work to overcome the project challenges, how development of strategic partners will help the project to bring cost efficiencies, how ethics and integrity should be maintained while dealing with external stakeholders – overall, communication and sharing information among all stakeholders are vital to a successful implementation of supply

chain management.

Risk analysis and management is one of the key factors for supply chain management. Work schedule, materials forecasting, consumption, delivery lead time, route map, mode of transportation all are considered during supply chain planning. Supply chain management helps to look at the bigger picture and helps to find out the risk factors beforehand.

The future of construction industry in our country is getting bigger and bigger each day as government seeks more and more foreign investment in different major infrastructure. This is the high time, we should bring changes in our construction management system. Introducing collaborative and integrated supply chain management in construction should be the first step to overcome the initial barriers. The supply chain management system will not only bring cost efficiencies but also the environmental sustainability by responsible consumption of materials and environment friendly material selection. We have already faced and learned the importance of supply chain management from covid-19 outbreak. During that time all construction projects were also faced materials shortages and price hike. Organization now a days trying to come up with more enhanced planning, forecasting, strategic partnership with suppliers/ vendors, visibility, real-time data sharing among stakeholders, optimized inventory, keeping logistics partner at arm's length – all are under different components of supply chain management. Now is the high time we embrace the changes and welcome the practice of supply management in construction industry.

Md. Minhaz Rahman Chowdhury
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The Art of the Supplier Relationship Management In Supply Chain Excellence

Today's business world is highly CROWDED and COMPETITIVE. Every organization is striving hard to find an appropriate strategy to gain competitive advantages over the rest of the competitors. In this complex business context, organizations don't compete nowadays but it's **SUPPLY CHAIN DOES**. In a world today that is described as VUCA (volatile, uncertain, complex, ambiguous), an AGILE end to end (E2E) supply chain is the condition of SUCCESS.

All supply chain processes of the manufacturing and service industry can be classified into the three macro processes.



Supplier Relationship Management (SRM) is one of the 3 key pillars of any E2E supply chain. But often many organizations don't pay much attention toward this important pillar of the supply chain. Neglecting the significant benefits offered by effective supplier relationship management can lead to impact on the deliverables of the supply chain adversely. It's like trying to sit on a three legged stool, where one of the legs is far too short.

Supplier Relationship Management (SRM) is a comprehensive approach to manage an organization's interactions with the other organizations that provide goods & services the

organizations uses. The goal of SRM is to streamline & make more effective the processes between an organization and its suppliers of goods & services for supply chain EXCELLENCE.

The organizations maintain a pool of suppliers to get the needed goods & services. Some organizations work with many suppliers for similar goods & services to promote competition & manage risk. Whereas some other organizations maintain few suppliers for better COLLABORATION and ease of management. The challenge is to find the RIGHT BALANCE of these two opposing strategies. The key is to have the **RIGHT NUMBER** of suppliers and the **RIGHT** suppliers to maximize the NET VALUE creation of the total supply chain. It's important to have different & **UNIQUE** roles to play by each supplier in the pool for the organization. The pool of the suppliers is DYNAMIC and changes according to strategies, performances & context of the industry.

It's very clear to the organizations that there are limits to the value they can generate by focusing purely on the price of the products and services they buy. These organizations understand that when buyers and suppliers are willing & able to cooperate, they can often find ways to unlock significant new sources of value that benefit them both. Closer relationships between buyers and suppliers could create significant value and help supply chains become more resilient. This realization is taking the supplier relationship management to the next level; strong collaboration with the key suppliers through the corporate partnership project.

Partnership is a win-win business relationship among organizations that share common values & purpose. It's the transformation of relation from buyer-supplier to collaboration to grow together. The challenges facing the business world today require collaboration & **transparency** among **people & organizations** sharing the same visions. With the strategic alliance of **partnership** with the suppliers, organizations can be prepared better to face the challenges and leverage competitive **edge** in their supply chain.

Successful partnership program adds various values in the supply chain as:

Best of breed: Only the best suppliers from the pool should be selected for the partnership program. So the organization can concentrate the efforts with the best suppliers and overall cost of SRM decreased even with better yields from the complete supply chain.

Power of Procurement: Partnership drives for the consolidation of purchase. As a result the purchase volume becomes significant with the key suppliers. And the organization gets the leverage to collaborate strongly with the suppliers to build customer centric, digital & sustainable supply chain.

Cost of Ownership: The approach here from both the organizations & its partners is to drive collaboratively for the cost reduction of each stage of the chain. Each player focuses to maximize the surplus of the complete chain. Organizations get a better total environmental cost of ownership (TECO) as a result of cost killing actions from each player of the supply chain.

Development of Autonomy: The business world is evolving as well as the supply chain. Many new skills will be needed tomorrow to better manage the complexity of SCM. Organizations in the partnership program work together to anticipate & build the skills needed in the future. Some jobs of the chain can be delegated to suppliers also to increase the efficiency of the supply chain.

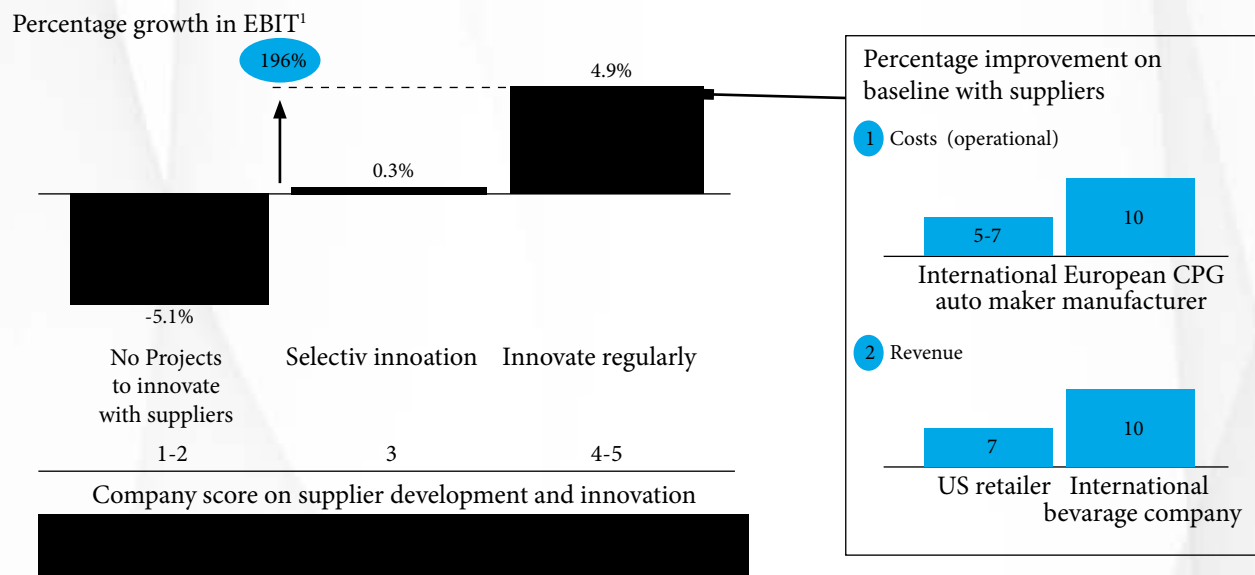
Sharing of Information: Partnership enables the integration of the system with the suppliers implementing supplier network collaboration (SNC) tools in the supply chain. Sharing the long term business projection helps the supplier to prepare the means economically. Exchange of live data seamlessly will minimize the bullwhip effect in the supply chain.

Operational Excellence: Through partnership programs, buyers and suppliers can work together to develop innovative new products. Focus strongly on boosting revenues and profits for both parties. They can take an integrated approach to supply-chain optimization, redesigning their processes together to reduce waste and redundant effort or jointly purchasing raw materials. Also they can collaborate in forecasting, planning, and capacity management—thereby improving service levels, mitigating risks and strengthening the combined supply chain.

Several studies have shown that supplier collaboration really does move the needle for companies that do it well. In one McKinsey survey of more than 100 large organizations in multiple sectors shows that companies that regularly collaborated with suppliers demonstrated higher **growth**, lower operating **costs** and greater **profitability** than their industry peers.

Outperform their peers.

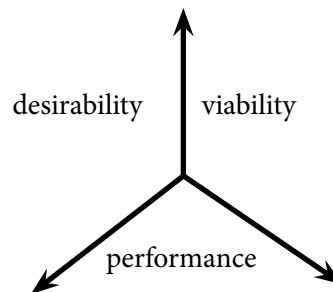
Leaders in supplier development and innovation tend to beat industry trends by ~2x in growth and other metrics



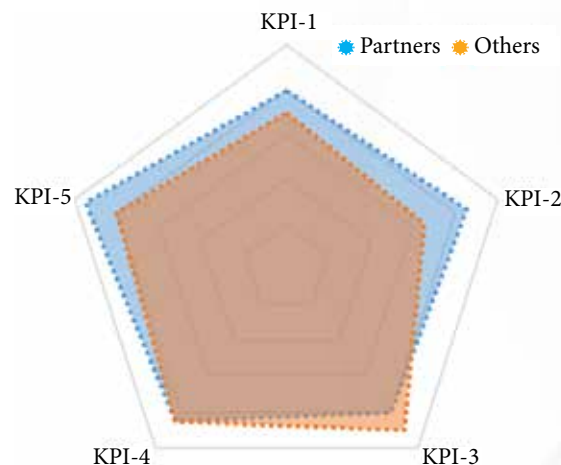
Partnership is a tested strategy for many organizations and lots of other organizations are focusing a lot nowadays to build new partners. There are some leading retailers of Europe & America with a very strong strategy to accelerate partnership and targeted to reach 70%-80% of products sourcing only from partners in the next 5 years. But the supply chain will get the benefit only after successful implementation of the partnership strategy. 3 key point of consideration on partnership;

Selecting the Right Partner: The intention of the partnership is to share the biggest business stake by the partners. Also the organizations should have long term business growth projection

and other strategies planning with the partners. So it's the key to choose the right partner to ensure organizations are putting the stake in the right basket. Organization should follow concrete category management & evaluation procedure to filter the right partners. Focusing more on corporate culture, operating style & business practices in selecting partners is really vital. A simple 3 dimensional matrix as below can be used in this process.

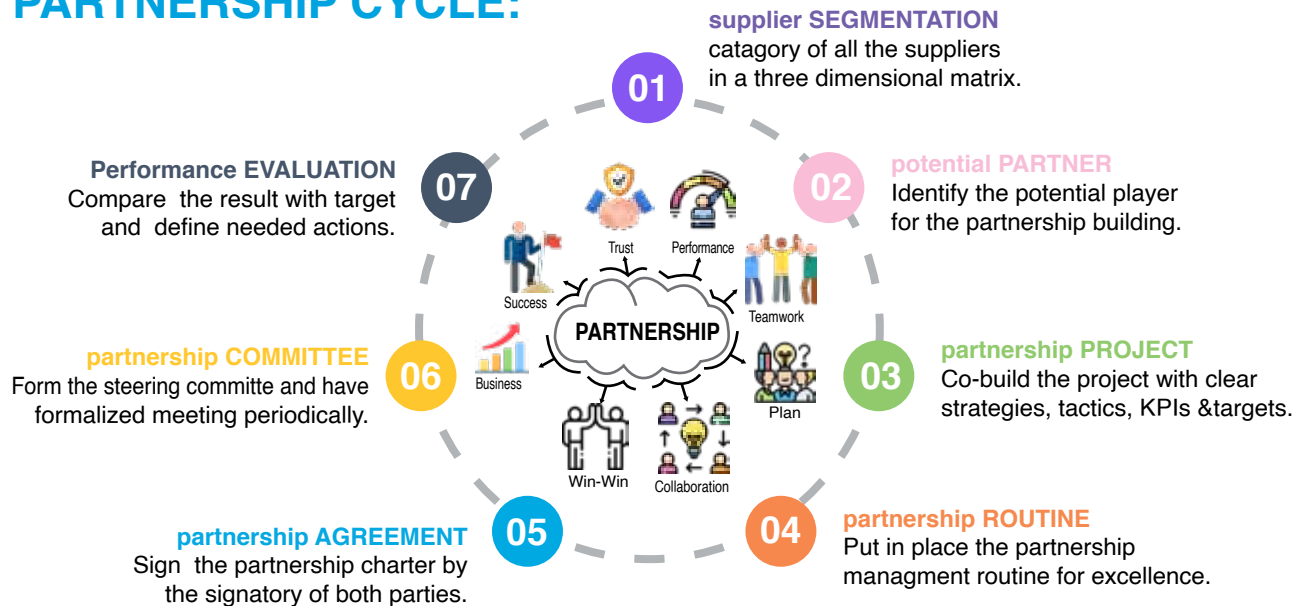


Performance Based Management: Partners should perform better than other suppliers for the organization. But the supplier may drive less for the performance in the belief that partnership will confirm the business growth. So co-build long term performance trajectory & follow up the performance progress through steering committee is the key. Continuously reviewing the performances of partners against others/ overall organization/ targets and among partners is needed to have a picture of the situation & take right actions to guarantee partners are performing at expected level.



Animation of Partnership: The organizations should put the right team to manage the partnership relationship appropriately. It's a both way relationship with interdependency & sharing of the profit created from this collaboration. The partners are only as good as the organization let them be.

PARTNERSHIP CYCLE:



In conclusion, partnership is undoubtedly a wonderful strategy for supply chain excellence. But it needs trust & commitment from both organizations. Careful selection & animation are very critical to enjoy the benefits of this strategy. Partnership will continue to contribute significantly in supplier relationship management to build a resilient supply chain.



Jaidur Rahman
Process Manager
Decathlon Bangladesh



Supply Chain

Challenges Faced in the Tyre Industry



Background

Bangladesh's vehicle sector is booming, fueled primarily by two-wheelers. Additionally, the nation is establishing itself as a key trading hub in South Asia with increased number of vehicles, and infrastructure projects and road development. Infrastructure development and the formation of heavy industries are expected to increase demand for commercial vehicles, consequently increasing the country's tyre consumption. The total number of vehicles registered in Bangladesh is 4.47 million units, up from the 2.88 million in 2000.⁽¹⁾ The country has 369,105 km of roads developed (paved 110,311 km and unpaved roads 258,794 km),⁽²⁾ While only in 2010, the Local Government Engineering Department (LGED) reported that number was estimated at 133,514 km (64,691 of km dirt road and 68,823 km paved roads).

The annual domestic demand for tyres is estimated to be 25 lakh pieces.⁽³⁾ The current market for tyres is expected to be worth Tk

5,000 core, with a 15 percent growth annually.⁽⁴⁾ An comparison, the market size was Tk 3,000 crore back in 2015.⁽⁵⁾ The commercial vehicle tyre category dominates the tyre market in Bangladesh, accounting for around 80% of total demand. The majority of this is met, however, by non-branded Chinese tires, which are generally low-quality but cheaper in price.

The increased number of vehicles and increased road infrastructure has created a market for tyres that is still untapped. Therefore, an opportunity presents itself to the investor to capture this market. However, several hurdles need to be overcome for investors to set up factories, both locally and as foreign investors.

The tyre business is one of Bangladesh's most import-dependent sectors. Despite the rising demand for tyres, local companies have only captured 10 percent of the market. In comparison, the remaining 90 percent is satisfied by imported tyres.⁽⁶⁾

Segmentation

The commercial tyre market is dominated by MRF India, holding 30 percent of the market share in the commercial tyre market. On the other hand, non-brand Chinese tyre makers have 51 percent of the market. While the Korean Hankook holds 1 percent, CEAT 3 percent, Birla 10 percent, and Apollo 5 percent.⁽⁷⁾

Manufacturing commercial tyres requires a higher capital investment, costing as much as BDT 1,500 crores minimum to set up a factory capable of producing such tyres. The demand from the domestic market, especially for the heavy tyre segment, is not at the level to utilise such factory's full capacity. For example, in 2019, right before the pandemic, the demand for such heavy tyres was 480,000 units.⁽⁸⁾ Almost all of it was met by using imported goods.

However, consumers were willing to spend more on quality brands from Japan and the US for private cars. As a result, brands such as Dunlop, Yokohama, Bridgestone make up the lion's share of the private car market, accounting for 70 percent of the private car market. One of the reasons may be that the consumer prefers to spend more on perceived quality, and thus is willing to spend more on more expensive branded tyres. The Thai Maxxi's makes up 20 percent of the market share, which is the mid-tier price. The Chinese non-brand makes up 8 percent, and the Korean supplies to the niche premium market, holding 2 percent.⁽⁹⁾

Rahimafrooz is the official distributor of the tyre brands Apollo and Dunlop.⁽¹⁰⁾ MRF, CEAT and Goodyear also rely on distributors.

Conditions Affecting the Demand for Tyre

To correctly estimate the total demand for tyres and its development trends, it is necessary to analyze some elements that can significantly influence such demand.

Road Network

While transport acts as a catalyst in the socio-economic development of a country, socio-



economic development in return generates demand for transport. Therefore, an adequate and efficient transport system is a basic requirement for both initiating and sustaining economic development.

-Transport facilitates the domestic market expansion by transporting surplus goods and services from production to consumption centres. Similarly, imports and exports are facilitated by efficient transportation.

-The transport system of Bangladesh consists of railways, roads, and inland waterways as well as two seaports for international shipping and civil aviation, catering for both domestic and international traffic.

-While railways and inland water transport continue to bear the main burden of long haul traffic, road transport has been assuming an increasingly important role in the movement of short-haul traffic, particularly manufactured goods and perishables.

-This trend will be further intensified with the expansion of the road network, both arterial and local.

-While infrastructural facilities in the road sector are provided by the government, operation in this sub-sector is dominated by the private sector.

-Because of the growing importance of the road transport system, a considerable amount of resources has been increasingly allocated during the Third and Fourth Five-Year Plan.

-The above data shows that around 2/3 of allocations to the transport sector are earmarked to promote road transport. Most of the investments are for the construction and maintenance of paved roads and bridges.

-Particular importance was given to the Padma Multipurpose Bridge Project. To support the economic integration of the potentially productive but relatively isolated Southern region of the country with the central markets and energy sources located in the Western

part, and to generate economic activity by substantially reducing transport costs across the Padma, the government has decided to build a multipurpose bridge over the river and has attached a very high priority to this project. The end of construction is scheduled for June 2022. The Padma Bridge will foster transport by road, and transportation of freight and passengers along this route is expected to grow by around 50%.

Supply Chain Challenges Faced by The Tyre Industry in Bangladesh

The raw materials required to produce tyres, such as rubber, carbon, yarns and chemicals, are not available locally. The raw materials such as rubber must be imported, mainly from Vietnam.⁽¹¹⁾ Therefore, local manufacturers face a number of disadvantages when competing in the domestic market, such as:

Import duties on raw materials are high, leading to the local manufacturers experiencing a 30-40% rise in production costs.⁽¹²⁾ However, the import taxes faced for finished tyres are only 10%. However, the government is starting to provide support by lowering the import duties faced by the tyre industry.⁽¹³⁾

Alternative sources of rubber are available from countries such as Thailand and Indonesia.⁽¹⁴⁾

Furthermore, a lack of raw materials is a barrier to local tyre production in Bangladesh. However, the situation may soon change as rubber, the primary raw material used in tyre manufacturing, is gaining traction in the country. According to some sources, the country's rubber production has been increasing at a pace of 20.61 percent every year. However, there are serious issues faced which are discussed in more detail below.

MRF Tyres, an Indian company, controls a significant portion of the Bangladesh tyre market. However, some private automobiles use more expensive products from Japan, Thailand, and the United States, such as Yokohama, Dunlop, and Maxxis. Bangladesh's

tyre imports are more than \$11.78 million, with more than 1.5 million tyres coming from various nations around the world.

Impact of COVID-19 on Global Supply Chains

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

Cost-Price Squeeze

The cost of production has been rising in numerous industries as a result of rising capital goods costs, rising wages and salaries, and rising utility prices, among other factors. The rising cost of production, along with low selling prices, has resulted in a cost-price squeeze and, as a result, underutilization of production capacity, which has a negative impact on the local tyre sector. Because it is already burdened by the high cost of raw materials.⁽¹⁵⁾

Inadequate R&D Activities

They are non-existent in the public and commercial sectors, as well as in industrial businesses and organizations. New processes/products, as well as market/trade knowledge, are difficult to come by. Despite the huge demand for large tyres, big local companies



have refrained from entering the market since it

requires large capital investments and reliable power supply. Two prominent names—Rahim Afrooz and Nitol—moved to create car tyres almost a decade ago, but their plans fell through due to significant capital investment needs and reliance on raw material imports.

Several investments made by foreign and local investors have been put on hold. For example, in 2014, CEAT invested over BDT 770 crores in the tyre industry in partnership with the local Bangladeshi conglomerate: A K Khan & Company. However, that project has been on hold due to unclear doubts about its production feasibility.⁽¹⁶⁾

Input Constraints

Import dependence of raw materials, and shortages in machinery, and spare parts from domestic sources, challenges with inland transportation and shipping especially due to the bulky nature of tires, and a limitation of local raw-materials supply owing to natural disasters all hampered the effective and proper operation of industrial units.

The country's yearly rubber requirement is roughly 30,000 tonnes, of which 18,000-20,000 tonnes are produced locally.

Rubber farming was expanding because the labour cost is less than half that of tea. Rubber was Tk 260-320 per kg in 2010-2012 but decreased to Tk 130 in 2013-14. In 2021, the price per kg of rubber was sold at Tk 90 to Tk 150. As a result, plantation owners are cutting down the number of rubber trees and switching to better yielding plants, decreasing the local supply of raw materials and forcing manufacturers to source raw materials from imports.

Rubber used to be around Tk 350 on the international market, but now it is under Tk 200, increasing import dependency.⁽¹⁷⁾

Along with import dependency and authorities' complacency, the rubber business suffers from a lack of effective planning and advanced

farming methods and machinery, repelling prospective investments from the industry.

Labor Productivity

In most industries, the IT sector remains underdeveloped and under-skilled. Overstaffing, a lack of required expertise and training in the specified sector, and other factors all contribute to low industrial labour productivity. This means that staff need to be developed from the ground up, which requires a large investment.



Staff development options include on-the-job training, coaching, mentorship, rotation

through numerous jobs, and training based on on-the-job training, in addition to a formal training curriculum. All of this aids personnel in comprehending not only how processes work, but also how they affect the value of the product.

Due to the lack of experience in tyre manufacturing, skilled staff and managers are yet to be developed in this sector, and the prospective entrant faces the challenge and cost of bearing the cost of developing the workforce from scratch.

Investment in technology and labor productivity in the supply chain will be key.

Poor Maintenance

Plant and machinery are poorly maintained due to severe financial limitations, a lack of sufficient experienced and trained staff as highlighted above, and the use of outdated technology, resulting in low production rates and capacity utilization of industrial units caused by frequent machinery breakdowns.

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Abid Ahmed
Management Trainee, Management Consulting,
KPMG Bangladesh

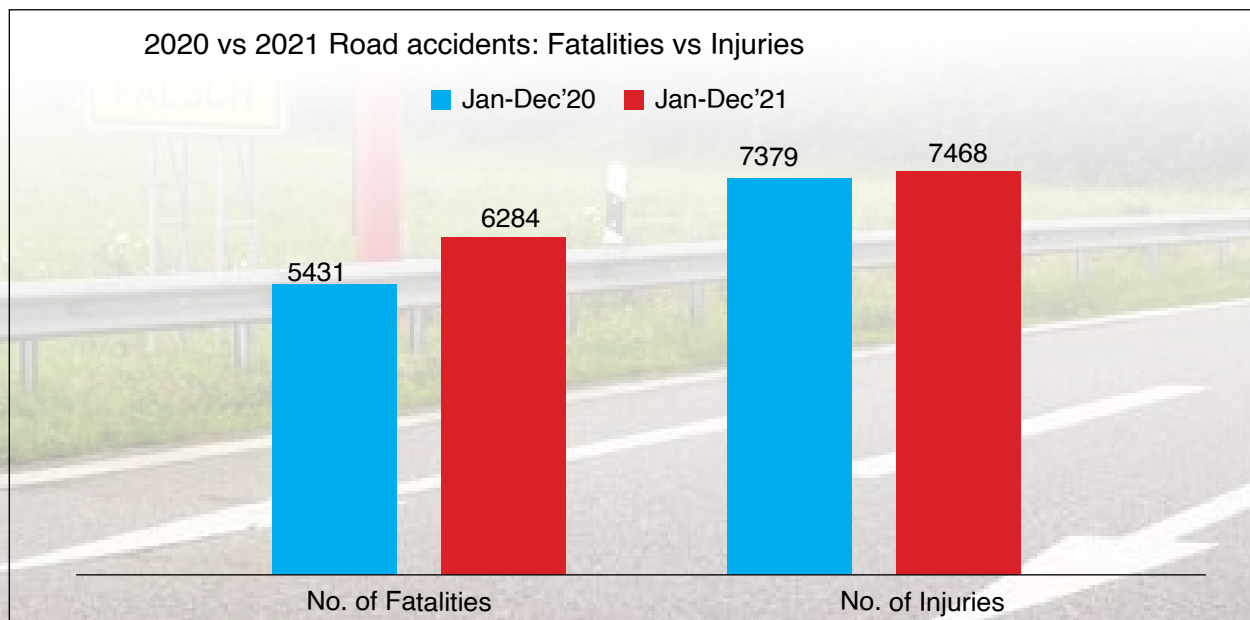


Road Safety as an Enabler for Supply Chain Performance



“At least 1,674 children (between one month and 18-year-old) died in road accidents across the country between January 2020 and April 2022, according to the Road Safety Foundation. “News from The Daily Star on 19th May 2022. Can you imagine how road accidents are killing our future generation?

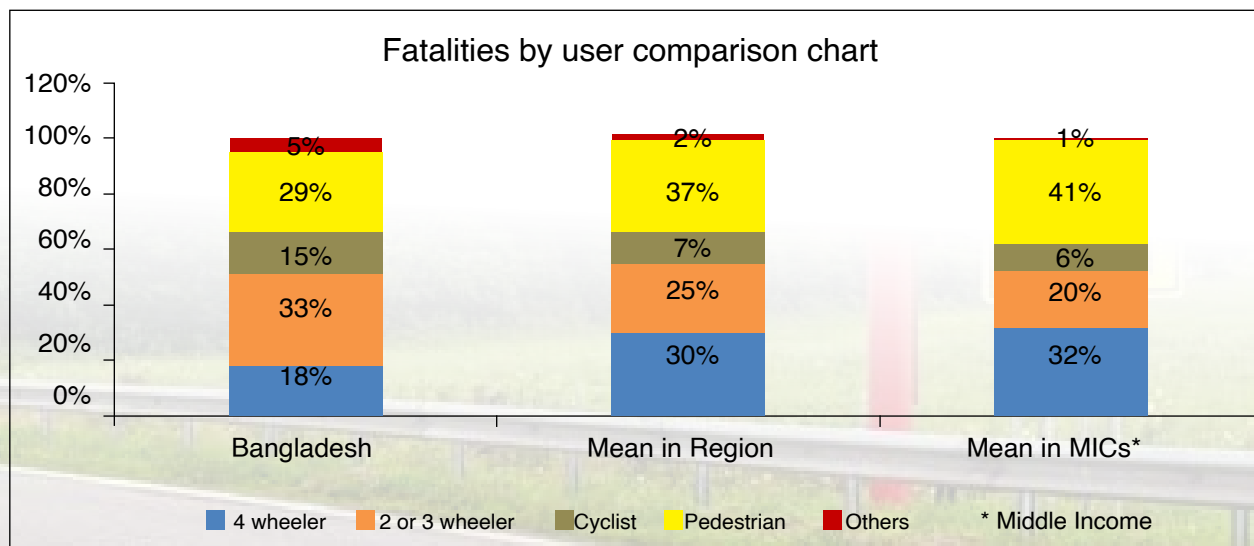
What supply chain is also known as Logistics, people can do? Are we doing enough to ensure road safety from our side? The graph below shows the increasing trend of road fatalities and injuries.



Source: Bangladesh Road Safety Foundation (RSF)



And according to the road safety country profile by the World Bank Group below is the fatalities comparison chart by user.



The above data indicates that low speed vehicles/pedestrian are the main victims of road accidents. And here comes the effort from supply chain leaders to contribute to reducing the rate of incidents.

The following initiatives can help to reduce accidents as well as their direct impact on improving supply chain/logistics KPI.



Implementing “Defensive Driving” Policy for Transport Management:

Defensive driving describes the practice of drivers who consciously reduce the dangers associated with driving. Defensive driving techniques reduce the likelihood of a collision or incident and can even save costs related to vehicle maintenance and fuel consumption by driving smoothly and steadily. Normally, we missed the cost-saving part and focused more on the training and other costs to adhere to the defensive driving policy. This benefit should be calculated and presented to the higher management for their on-boarding.

Proper Consequence Management Policy:

Normally in our country especially for drivers we talked about Punishment first and almost no reward. We need to start taking on a reward policy as well. Almost every company in Bangladesh provides a trip allowance; can we add a safe trip allowance? This means if a driver makes a certain number of trips safely in a month, he will be rewarded. This will eventually improve truck turnaround time and minimize idling time on the road.

Vehicle Maintenance: improve on timely maintenance, which eventually will increase vehicle availability. Thus, accidents due to vehicle malfunction (i.e.: Brake failure) will reduce and the number of trips will increase. And ultimately, the number of trips in a month will increase.

Drivers Working Time: A very common malpractice is drivers’ continuous working hours without proper rest, and a very strong argument is normally placed by fleet managers’, if we do not increase the working time, it will increase the cost of drivers. Did we ever think of the cost of one accident?

Driver Licensing and Vehicle Documentation: It is a must to abide by the law. We can also avoid a penalty from the law enforcement authorities.

Deabasish Paul
Deputy General Manager
Abul Khair Group

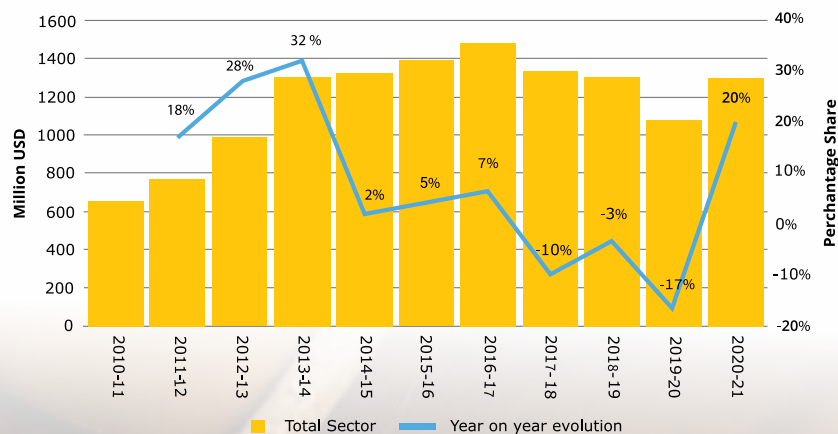


Five Lessons from COVID-19 for Bangladesh's Footwear Industry Supply Chain



The Bangladesh footwear industry is one of the fastest growing industries in the country, growing 25-30% year on year in the last decade. According to the World Footwear 2021 Yearbook, in 2020, Bangladesh was the 8th largest footwear producer (423 million pairs)

and the 9th largest consumer market (366 million pairs). Most of its production supplies the domestic market: only 72 million pairs were exported in 2020 (making it the 16th largest exporter of footwear). Bangladeshi exports have been growing consistently and sharply for years. They dropped in



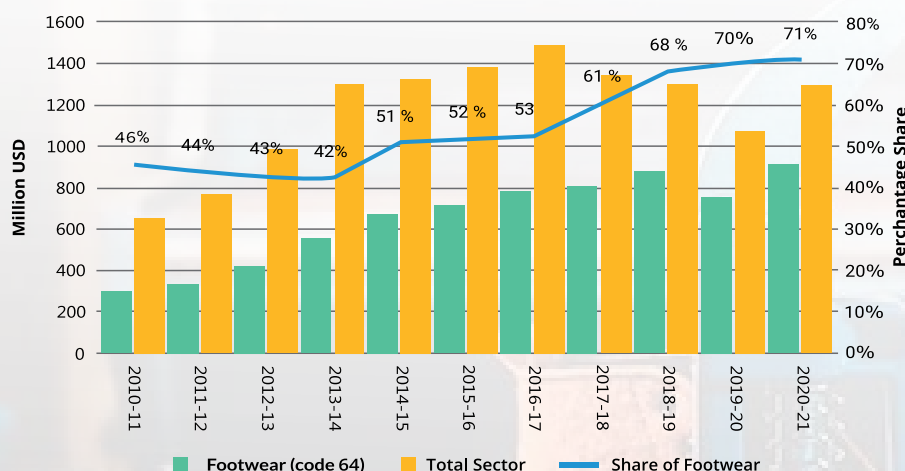
Bangladesh Leather Sector Export 2011-2021

Source: Footwear Exchange Report – A decade (2011-2121) of Bangladesh Leather Sector Export

2020 for the first time in a decade, off-course for COVID, but bounced back strongly in the 2021-22 financial year. As per the report of the Bangladesh Export Bureau, in the first nine months of FY 21-22, 877.84 million USD of footwear (both leather and non-leather) were exported from Bangladesh, and that is 71% of the total export from the leather sector, which is the 2nd biggest after garments. Some industry experts believe footwear is one such sector that has tremendous potential to significantly boost the country's exports while diversifying the economy's export basket. We have been observing some positive momentum in this

This is even more true for Bangladesh's footwear industry supply chain. In reality, Bangladesh's footwear industry depends heavily on imported raw materials (both for export and the domestic market). Our very own "leather" is struggling in image building on compliance issues (most big importers use imported leather), and modernization of the supply chain is still far away, both from people and technology perspectives. From the pandemic, it has become even more relevant to look at those big issues. The world will not go back to the same as before the pandemic. So, what were the greatest lessons the Bangladesh footwear

industry learned from the pandemic? Here are some.



Export Trend of Footwear Vs Total Leather Sector Export 2011-2021

sector recently, both in export and investment, but at the same time, we see some challenges that could hold us back from this growth and here come the supply chain challenges as well.

Not only in footwear but in all sectors, the last decade was a decade of globalization. It is a fact that we are now living in a world where the largest shoemaker does not produce shoes; they only design and sell them. We are not living in that period when big companies or manufacturers have all their backward linkage industries under one roof or premises. Now everyone is "global", so they think and source from global sources. It went very well in the pre-pandemic era but has now become a risk to the supply chain.

needs to be started. We have already seen some initiatives at an individual level, but the greater benefit will come if we move on a consolidation approach. An analysis of our need for different raw materials, based on a clear long-term strategy, should be implemented immediately. By the time we develop our own raw materials hub, we need to diversify our current raw materials sourcing. Right now, like other industries, Bangladesh's footwear industry also depends on Chinese raw materials suppliers. That could also bring a new investment opportunity if we can have a holistic approach with them.

Lesson 2: By any cost, the image of our own "leather" needs to be rebuilt. No negotiation on sustainability

After the pandemic, we are in a process where the concepts of sustainability and circular economy gain more importance. All major clothing and footwear brands have become more important than before by taking even more measures to ensure social compliance conditions wherever they make products in their supply chain to cope with such a new crisis. There will be no negotiation on this. For the last couple of years, Bangladesh's leather industry has been



going through a crisis over environmental and social compliance issues, which have pushed export earnings down. The crisis deepened with the slow relocation process of tanneries from Hazaribagh to the Savar Leather Industrial Park. Rebranding the country's image as a compliant and genuine leather supplier by ensuring social and environmental compliance in the sector is a must.

Lesson 3: *Buyers can't have control of everything. They need us as much as we need them. Partner based relationship is a reality now*

In the pre-pandemic era, Bangladesh's footwear industry was "buyer-driven," and it still is. But during a pandemic, all parties realize that it is not possible to go alone. Buyers can't take their suppliers for granted. Suppliers have become more important than ever to ensure speed to market, competitive pricing, and a lot more. They clearly need suppliers just as suppliers need them. It is now a golden time to be equal partners on a shared journey towards business

success and sustainability. Both parties need to be sensible and understand each other's concerns.

Lesson 4: *Investment in people and modernization of the supply chain is more relevant than ever*

The traditional way of managing people in the Bangladesh footwear industry is concerning now and was concerned before. As soon as we understand that we are going to manage the "most advanced generation" as our workforce, they expect us to give them full attention. The availability of a workforce will not be granted anymore. Diverse opportunities are around them. We need to keep them. Our approach to them should be smarter than they are. During the pandemic, we have learned the importance of technology. We are embracing new tools without fear of failure. We realized how backdated we were.

Lesson 5: *Adapting elasticity and flexibility in supply chain is key*

We have seen a lot of up-down of our order flow. Online is going higher than ever. That impacts our production plan as we must manage small orders. The large volume order for continuous one line production has gone out already. A pandemic has pushed supply chain players to prioritize resilience over efficiency, cost over speed. As soon as we adapt to those changes, we have more chances to succeed.

The biggest lesson for the pandemic after 2 years is that changes that happened forcefully will not change very soon. They will stay and will be the new norm. We need to challenge pre-pandemic norms and past practices. It teaches us that we can change quickly, so it will demand quicker in the future.

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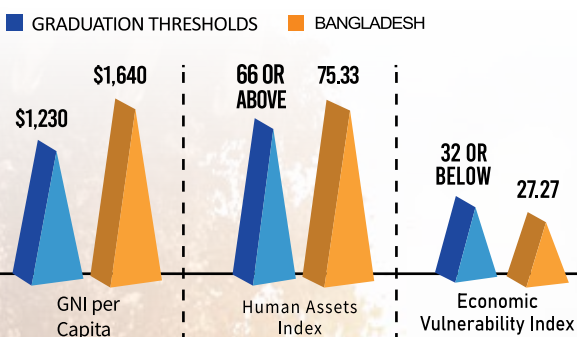




LDC Graduation: Challenges and Opportunities for Future Bangladesh

GRADUATING CRITERIA OF LDC: BANGLADESH PROFILE 2020

Source: UN CDP



LDC STATUS



Inclusion:
1975

Fulfilled
eligibility
criteria:
2018



Recommended
for graduation:
2021

3 COUNTRIES THAT MET LDCS CRITERIA



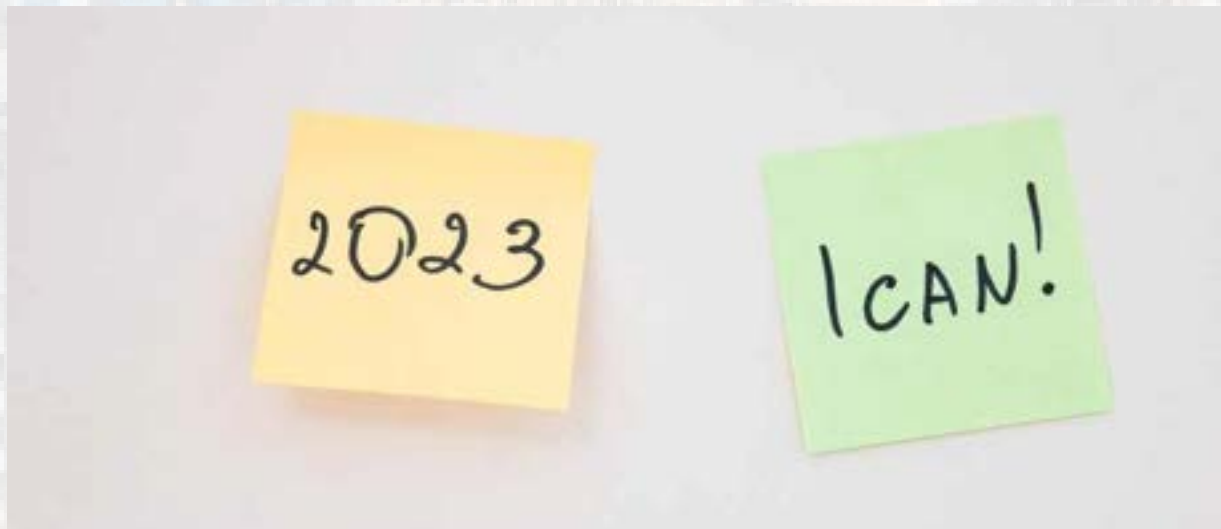
At the 40th general assembly of the 76th session of the UN, Bangladesh was officially declared as a Least Developed Country (LDC) to a Developed Country. Despite the possibility of exiting the LDC group in 2024, virtually three years after the announcement in 2021, UN-CDP's response to the intervention of the Bangladesh government during the Corona epidemic has extended this transition period by two more years to 2026. The country has met, for the second time, all the three eligibility criteria for LDC graduation involving Gross National Income (GNI) per capita, the Human Assets Index (HAI)*, and the Economic and Environmental Vulnerability Index (EVI)*. Undoubtedly, this is one of our greatest national achievements after the victory in the war in 1971.

The economic potential of the countries that

have crossed over from LDC is considered to be high. There will be no badge of a poor or least developed country. It will be considered a fully developed country, which will be a manifestation of its social and economic potential. Due to its economic capacity, Bangladesh will be able to borrow more from international lenders at higher interest rates. Bangladesh will be able to spend more on infrastructure and human resource development if it can borrow more. Again, foreign investment will be attracted as it has sufficient capacity to deal with economic fragility. Hopefully, the World Bank, the Asian Development Bank, most United Nations system agencies, GAVI - the Vaccine Alliance, the Global Fund, and most official development aid are not likely to be affected by LDC graduation.

markets. According to a recent WTO report, these tariffs could reduce exports by 5.36 billion dollars a year.

The pharmaceutical industry may face major challenges. Withdrawal from the LDCs will lead to stricter intellectual property regulations in the pharmaceutical industry. As an LDC, pharmaceutical companies in Bangladesh do not have to pay for the intellectual property rights of the inventor. This is because the price of the drug may go up if the patent is paid. For this reason, the poor citizens of LDC will not get medicines at low prices. The prices of Bangladeshi medicines will go up even in the countries where Bangladesh exports medicines. As an LDC, Bangladesh has got more of this facility. Bangladesh's pharmaceutical industry stands on a solid



On the other hand, exiting the LDC will be the biggest problem in the export sector. Because, as an LDC, Bangladesh gets duty free trade facility under the World Trade Organization (WTO). The European Union also receives such tariffs on a regional or bilateral basis (e.g., India and China). According to the existing rules, these facilities will be closed in 2026. However, under the GSP in the European Union, this duty-free facility will remain until 2027. After leaving LDC, tariffs will be levied on Bangladeshi products at regular rates in these

foundation. The pharmaceutical industry will not have this advantage if any country gets out of the list of least developed countries before 2033. According to the existing rules, this facility for Bangladesh will end in 2026.

So, some trade and other benefits of Bangladesh will be automatically canceled if it is removed from the list of LDCs. There will be some benefits, but they will have to be achieved. Needless to say, our export products need to survive the intense competition in the

world market. The benefits we used to get in the world supply chain may not be the same anymore. Various exclusive access and one-sided trade advantages that we have so far received will no longer be possible to maintain; we will have to export to maintain the standard of world trade.

Due to the high economic potential of LDC graduation countries, easy access to loans from international aid agencies may be limited. In addition, as an LDC, any country can provide cash assistance and subsidies on goods or services produced in its country. Bangladesh now subsidizes various products or services in the agricultural and industrial sectors. There may be pressure to stop providing these subsidies and cash assistance. International organizations and developed countries also provide various types of scholarships to students from the least developed countries. With the passage of LDC, the number of such scholarships will be reduced.

We know that these challenges may come, and we have worked tirelessly to overcome them. So now it's our turn. In the new reality, our pace should not slow down in the middle. It is not enough to just fall with the export hit, we have to widen our eyes to see. The Daily Star's Debapriya Bhattacharya, a member of the United Nations Committee for Development Policy (UN CDP) and a distinguished fellow of the Centre for Policy Dialogue (CPD), told The Daily Star in an interview that the LDC exit trajectory has been finalized, so Bangladesh must develop a solid "LDC Transition Strategy" for the next five years and beyond. Therefore, the five-year plan of our country may be amended, and the Delta Plan 2100 may have to be matched with the LDC transition plan. This means that the whole plan needs to be redesigned to make it easier to get out of the LDC, minimizing the losses and maximizing the benefits. Early signs of this process's activation may have already been detected. To combat the predicted trade shock, Bangladesh,

for example, is already investigating alternate trading arrangements through bilateral (and regional) free trade agreements. In this way, the adverse effects of increasing domestic tax collection can be mitigated.

According to a source published in the Business Inspection BD on June 7, 2022, although all sectors except RMG have so far paid 30% tax for exporting goods and services, at present the government intends to introduce a 12% corporate tax rate at the same rate as



RMG for export diversification for all export sectors. Massive business tax cuts will ensure that all other industries have equal access. Furthermore, with this export-friendly effort, the trade imbalance with other nations will be reduced. Again, green industry export tariffs will be set at 10%, and the government is prepared to decrease a 10% levy on internet service

providers for sourcing internet services. This decision would reduce bandwidth fees made by international corporations with no presence in Bangladesh from 20% to 10%. There will be a 10% tax instead of a 12% tax on advisory, consultant, professional, credit rating, technical services, and technical support costs. The government is to be commended for this kind of great initiative in the export sector, as well as the government has to take steps to expand the domestic market. Work needs to be done to create easy opportunities for domestic

entrepreneurs.

Our greatest strength is our energetic workforce. After the population boom in the '70s, the number of working people aged 15 to 64 is said to be the highest in Bangladesh at present, which is called the demographic dividend. The benefits of this demographic dividend will not last a lifetime in Bangladesh. This means that such a large labor market has to be turned into highly skilled labor; they have to be taught to operate heavy machinery; and they have to invest in the large industrial sector so that maximum benefit of the demographic dividend can be achieved. In this era of the Fourth Industrial Revolution, we need to increase the training opportunities to enhance the skills of all workers, including middle managers. We need to expedite the implementation of our special economic zones, paving the way to attracting foreign investors. Efforts to win the confidence of foreign investors need to be intensified by simplifying trade rules. The use of technology will increase. So we have to give our manpower a chance to acquire suitable skills. Besides, the education system has to make arrangements to supply manpower as per the demand of the new age. We must make it a priority to ensure that our limited resources and foreign investment grow in the productive sector and create jobs.

So we have to be optimistic. Don't be afraid of LDC graduation. Bangladesh has always proved itself to the world. So this time too, Bangladesh will prove itself by overcoming all obstacles.



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The metaverse is experiencing a worldwide boom, fueled by the impact of COVID-19 on technology businesses and interruptions to offline business activities. The development of crypto currencies, digital assets, and no fungible tokens (NFTs) stimulates demand for the metaverse even further. The metaverse, defined as a virtual environment in which people can interact, is increasing into a progressively vast and rich ecosystem that includes metaverse gateways, platforms, and infrastructures, as well as a diverse variety of service providers to enhance the customer experience with identity, social, gaming, and financial infrastructure. By 2026, 30% of the organizations in the world would have products and services ready for the metaverse. To understand the metaverse properly one needs to understand the elements of the metaverse.



Apparel Industries

As we integrate the digital and real worlds, the metaverse redefines how we utilize technology. Apparel companies are participating in the digital revolution by developing digitized apparel. The introduction of virtual fashion will abolish physical constraints. With the usage of Digital Fashion, there will be no size or material restrictions. As a result, consumers may dress freely and use materials they would not be able to wear in the real world. The garment business is becoming more accessible for sellers and buyers, as well as addressing the need for sustainability, thanks to Metaverse.

In creating a digital platform for nearly everything, there will be virtual helpers doing virtual tasks and wearing virtual clothing. Because this is new to both the market and consumers, everyone is attempting to get a taste of it, resulting in a lot of excitement around digital fashion. Many well-known companies, such as Nike, H&M, and Adidas, have already begun to capture the digital market using NFTs, allowing them to have a virtual assortment of fashion with no financial investment.

Retail and Consumer Brand

In the world of digital ingestion, firms' approaches to developing direct contact channels with customers are evolving. The metaverse now offers a new notion for firms to play with, from the early days of constructing a website to embracing e-commerce, opening social media profiles, and even live to stream.

In recent years, the popularity and rising relevance of virtual characters or avatars have presented a variety of commercial options in the retail sector. Many customers today demand

a mix of in-store and digital experiences, and the metaverse allows them to interact with companies and goods through a customized avatar. The possibilities are unlimited, whether it's putting on clothes, everyday essentials, test-driving vehicles, or simply improving the shopping experience in a virtual store.

Brands have planned or engaged in interactive activities with customers in addition to selling products. The metaverse has become the new playground, particularly for premium fashion designers, with some releasing their new collections there and others collaborating with developers to build their own unique games.

Financial Service

Aside from retail, Metaverse technology is reshaping the future of employment, with instances seen in the financial services industry. VR and AR have enabled coworkers to interact efficiently when not in the same area, thanks to remote working circumstances catalyzed by COVID-19, employing capabilities such as chatting, annotating, and screen-sharing. These tools are also very beneficial for analyzing financial risks in an individual capacity for data visualization. The Metaverse's practical applications' crown jewel, however, is its capacity to deliver more ease to professionals

and clients alike, with VR and AR being applied in client-facing scenarios.

The incorporation of digital technology into conventional areas such as

banking has fueled customer expectations for the services they wish to be provided with. Once these services are accessible, rivals that want to stay relevant must keep up with improvements. The spread of the Metaverse is regarded as the next inexorable technological advancement,



with millions of dollars being invested in virtual experiences and infrastructure, as well as continual financial incentives for innovation and competitiveness.

Real state

Property and real estate are valuable assets in the real world, which calls their worth into question in the metaverse. We anticipate that

purchasing habits have spurred heated debates over virtual real estate investing.

We foresee more marketers breaking down the barriers between virtual and reality shortly to develop more inventive, meaningful experiences with customers.

Impact in Industrial Manufacturing Sector



the metaverse will mimic and acquire real-world features and that the notion of supply and demand will influence the value and price of virtual land and real estate.

Like in the real world, location influences the value of land in the metaverse. The distance from the metaverse's center and the quality of neighbors are the two elements that define the worth of a place. Many worldwide celebrities'

Teach staff more quickly and safely

Several organizations have begun employing VR headsets to train employees on how to use and maintain equipment, rather than having them utilize physical equipment that can be unsafe or difficult to use in training settings. Furthermore, rather than having employees sit in classrooms all day reading textbooks, the notion of immersive learning blends the feel and presence of VR with learning theory, data science, and space design, increasing

the learning experience for employees. Unlike on-the-job training with heavy equipment or in dangerous locations, learners can make mistakes in virtual environments with no real-world consequences. Because of these advantages, many businesses are turning to VR training as a first step in educating new personnel, particularly in the industrial and heavy industrial sectors.



Innovations can be determined using simulations prior to practical deployment. The virtual world includes a method known as digital twinning, which involves digitizing all components of a physical place (or product) to create a virtual twin. Digital twins can be used in manufacturing to compare product designs to physical copies of items, such as discovering product faults, or virtual environments can be created for simulation. Many self-driving car designers, for example, are already using simulations of real-world places to fine-tune and better train cars how to work.

Product design cooperation can take place almost everywhere in the world:

Another important area where the epidemic has pushed VR activity is product design by manufacturers. Engineers can collaborate on designs in a conference room while everyone is in the office, but when everyone is working from home, they need a different solution. Design engineers may interact remotely and build virtual designs from anywhere on the globe using virtual reality.

The team can start with a clay model that one person can produce visually and then proceed to design it with CAD software. When considering cooperation, consider using mixed reality (AR and VR) to produce 3D models and allow teams to participate in automotive design and development.

Create tangible things based on virtual designs and digital materials derived from physical projects:

Connecting the real and virtual worlds will provide manufacturers with several options and may open up new revenue sources. While virtual-to-virtual trade has been around for a while, video game gamers may now purchase digital things for real money. However, new ideas are developing in which tangible things might be made using designs inspired by virtual places.

The future may consist of having a virtual experience and purchasing something that can be delivered to your home. Physical objects can be purchased for a physical experience, unlocking something in a virtual realm, and vice versa.

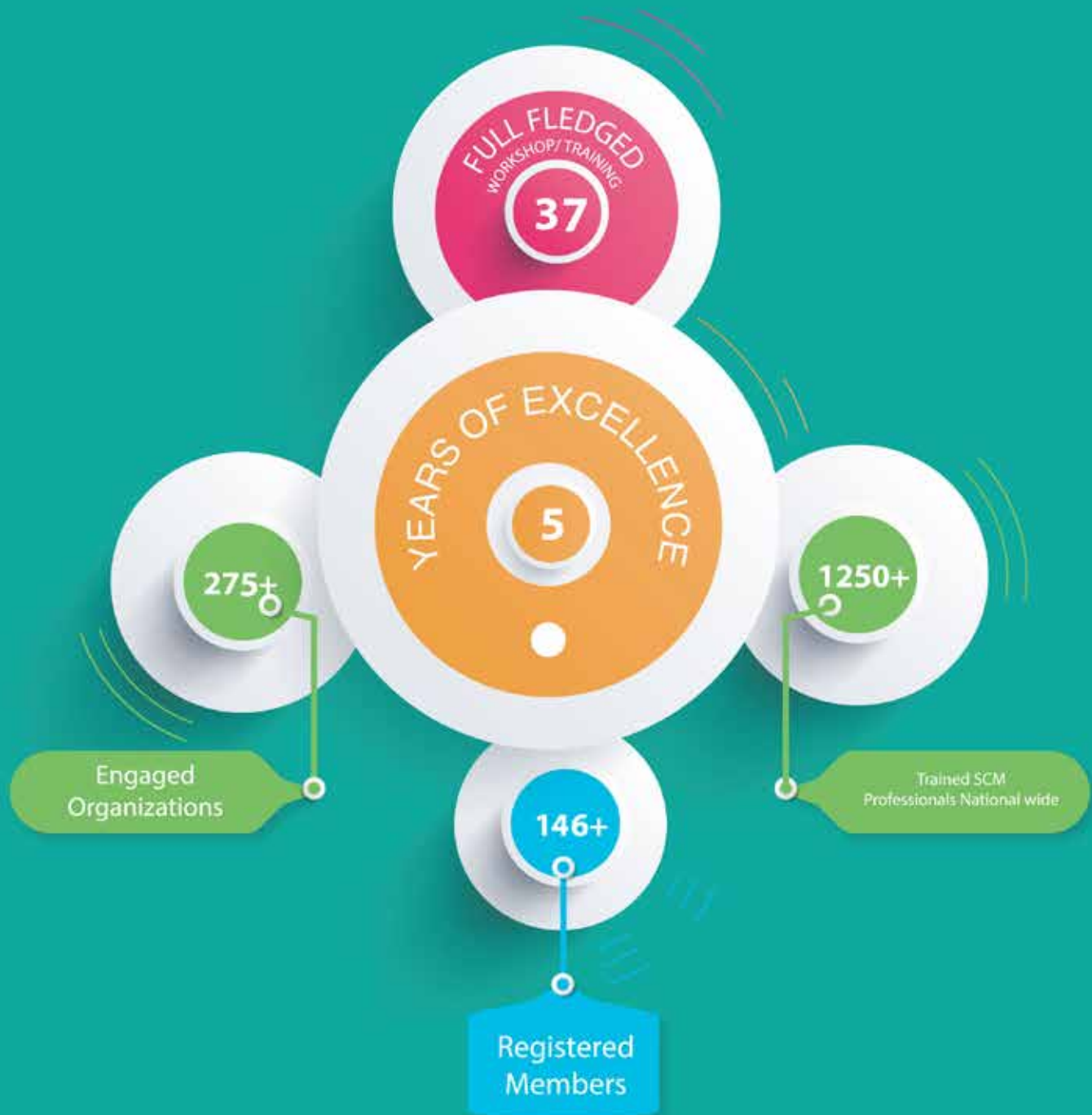
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