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MATERIALS MANAGEMENT REVIEW

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CUSTOMER VALUE

From the Desk of The National President

Dear Members,

Greeting from National President!!

Last few weeks have been very crucial for India with respect to the ongoing border situation at LAC. As a country we have been fighting on multiple fronts viz. Pandemic situation, Chinese incursion from our norther frontier, falling GDP, stagnation in economic activity etc. Unitedly as a Country we are capable to withstand any challenge. Our Government has shown tremendous restrain in dealing with multiple challenges however still a lot remains to be done. There is a global sentiment building up against China as a result of the ongoing Pandemic which has brought the whole world to brink. Hence several counties are moving their manufacturing bases from China and shifting to other countries. Although India could get only a small pie of the business but still this is very significant. India has an unique advantage of skilled labour, young workforce, reasonably good infrastructure and we should strive hard to ensure that we make the best use of this opportunity.

Although it is quite early, but signs of economic recovery is slowly becoming visible. The unemployment rate which had peaked at the height of lockdown has drastically reduced and in near future it will further improve. There is a reverse migration of the laborers back to the cities as industries are slowly opening up. As hostility towards China is increasing, now there is a serious efforts on the part of the organization to boycott Chinese products. The onus is now on the SCM professionals to sources key inputs from Countries other than China. Organizations will also have to adjust to new normal since they will be compelled to switch over to alternate products which may not be cost competitive. As it is said, necessity is the mother of invention, attempts are being made to produce things locally. This will provide a big impetus to 'Make In India' initiative.

On the IIMM front a major milestone is achieved in terms of getting AICTE recognition of our courses viz. PGDMM and PGDSCM & L renewed for another one year period. Also the intake quota is changed to 400 seats per course taking the total to 800 seats. Let's put in our all-out efforts to enroll to avail the full quota of seats approved by AICTE.

As India is entering Unlock #2 we all need to be more cautious to keep our self safe. We should strictly enforce and practice social distancing norm, maintaining good personal hygiene, wearing mask in public places or whenever we are in group.

Stay healthy and stay safe.

With Warm Personal Regards

Malay Mazumdar
National President, IIMM
Email: Malay_mazumdar@yahoo.co.in

From the Desk of Chief Editor

Dear Members,

The continuous and ever-increasing use of natural resources has led us open to many foreseen and unseen events. Recent Examples are Australian Bush Fire, series of earthquakes in past three months around Delhi and Covid 19 Pandemic. The Covid 19 Pandemic has provided a preview of the disruptions to come and made people realise the fragility of Human Biology, if we do not address the climate changes.

This pandemic has also brought in positives for mother earth, as it found some time for self-regeneration, self-healing. Various Governments have spent Crores of Rupees in cleaning the rivers but could not succeed. However, during this lockdown, rivers get cleaned by itself, Air pollution was at lowest level and people were breathing fresh air.

Work from Home, setting up virtual offices, carrying out various activities of business virtually except the activities, where Physical Presence is required, have provided an opportunity to People to reunite with family and spend some quality time with them, which is rare in the normal routine life. It has resulted in least vehicular movement, least Power Consumption at Offices, least Industrial waste and least Greenhouse Gas Emissions.

However, lot more has to be done post this pandemic. As consumers and Organizations are becoming more aware of Environmental issue, introducing more ethical and sustainable supply chains will be a good practice for any business. It will improve regulatory compliance, enhance business branding and reputation, reduce waste and overhead, and reassure consumers on ethical environmental sourcing.

As a Purchase or Supply Chain Manager, we hold a key responsibility in bringing down the Pollution levels in Supply Chain. Consumer Packaged Goods Companies are one of the main sources of Environmental Deterioration and 90% of this is caused during the Supply Chain including 80% Greenhouse Gas Emissions.

Efficient Demand and Supply Planning to control production, Logistical Route Optimization to save Fuel, streamlining Supply Chain Process to reduce waste are key components of any supply chain, which can be controlled efficiently with the help of Technologies like Machine Learning, Artificial Intelligence, Blockchain Technology, Internet of Things and predictive analytics.

We are standing at a point, where we can choose to be with the changes suggested by Nature or we continue on the prior path, where existing ways of doing business survives. We should embrace the opportunity for change by accepting the new normal and a forward-looking supply chain strategy combined with the right technology solutions will help organizations build more sustainable, responsible and ethical supply chain.

(DR. M.K. BHARDWAJ)

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Correspondence :
MATERIALS MANAGEMENT REVIEW

Indian Institute of Materials Management
4598/12 B, Ist Floor, Ansari Road,
Darya Ganj, New Delhi - 110 002.
Phones : 011-43615373
Fax: 91-11-43575373
E-mail: iimmdelhimmr@gmail.com &
iimm2delhi@gmail.com
Website : www.iimm.org

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Phones : 011-43615373 Fax: 91-11-43575373
E-mail: iimmdelhimmr@gmail.com & iimm2delhi@gmail.com
Website : www.iimm.org

CHALLENGES OF IMPLEMENTING INDUSTRY 4.0 FOR EMERGING SUPPLY CHAINS IN DEVELOPING COUNTRIES IN PURSUIT OF REACHING THE LEVEL OF EXCELLENCE THROUGH THE PRINCIPLES OF TOTAL QUALITY MANAGEMENT

DR. GOUTAM SENGUPTA
VICE CHANCELLOR OF TECHNO INDIA UNIVERSITY
goutamsenguptacbs@gmail.com

Abstract

In today's world, the supply chain is a multi-faceted ecosystem linking product development, manufacturing and distribution networks into one fully transparent and digitised system. Modern supply chain tenets rely heavily on emerging technologies and out-of-box thinking. Industry 4.0 which is sweeping the globe today, naturally has its own impact on supply chains and terms like supply chain 4.0 has been coined.

The arrival of Industry 4.0 is heralding the next era in supply chain management, in which suppliers and customers come together in entirely new ways, blurring the lines between the digital and physical worlds and erasing traditional organizational boundaries.

While much progress to this effect has been achieved in western world, it remains a major challenge for developing countries to adapt to this new era of technological disruption given the level of workforce abundance and wasteful practices prevalent in industries of developing nations. But there is neither any alternative also in the future but to embrace it.

Industry 4.0 shall disrupt current state of Supply Chains for sure in developing nations. Question is how a company leverages the benefits to the fullest extent more so in a developing country not fully ready with 4.0 technologies as well as considering implementation in the given socio-economic environment.

This article attempts to draw the road map for implementation of Industry 4.0 keeping in mind the above factors to reach the level of organisational excellence through the principles of Total Quality Management.

Keywords : Industry 4.0, Supply Chain 4.0, TQM, Disruptive Technologies, Lean technology

Introduction : Over the last thirty years, Supply Chain Management has undergone a tremendous change: from a purely operational function that reported to sales or manufacturing and focused on ensuring the supply of production lines and the delivery to customers, to an independent supply chain management function. The focus of the supply chain management function has shifted to advanced planning processes, such as analytical demand planning, which have become established business processes. The supply chain function ensures integrated operations from customers to suppliers.

The arrival of Industry 4.0 is heralding the next era in supply chain management, in which suppliers and customers come together in entirely new ways, blurring the lines between the digital and physical worlds and erasing traditional organizational boundaries. Industry 4.0 creates a disruption and requires companies to rethink the way they design their supply chain. Several technologies have emerged that are altering traditional ways of working. The supply chain industry is also undergoing a transformation, adopting digitization, automation, and centralized business intelligence systems. The introduction of cyber-physical systems and the Internet of Things (IoT) is revolutionizing the pace of this transformation in supply chain management (SCM).

While much progress to this effect has been achieved in western world, it remains a major challenge for developing countries like India to adapt to this new era of technological disruption given the level of workforce abundance and wasteful practices prevalent in industries of developing nations. But there is neither any alternative also in the future but to embrace it.

The most relevant benefits the Supply Chain 4.0. shall provide:

- Unthinkable Levels of Customer Centric Flexibility
- Precise Customer Centric Quality Standards
- Superior levels of Efficiency and Productivity surpassing Customer's expectations
- Drastic reduction in "Time to Market"
- Accurate levels of optimisation of decision making

However, higher levels of collaboration between machines and humans could socially impact the lives of the workers in developing countries specially.

Given an organisation and its vision - the market, the competition, the physical & social environment, state and complexity of Supply Chain, shall determine the phases of opportunities for implementation of Industry 4.0 technologies for disruption of its current state Supply Chains.

This research paper attempts to suggest a roadmap for implementation of industry 4.0 for emerging supply chains in developing countries aligning the organisational vision and needs with customer centric technology adoption.

Total Quality Management (TQM) : Total Quality Management is a concept which was authored by Quality Gurus like Joseph Juran and W Edwards Deming. It refers to the quality of the entire enterprise and differs from the concept of quality of products and services alone. To establish this concept, Dr. Juran has used the word "Big Q" meaning quality of enterprise vis-à-vis "Small q" meaning quality of products or services. It is argued that organization excellence is driven by the concepts of TQM. TQM practitioners conventionally uses the following quality technology tools (QTTs): Brainstorming, 5WHYs, 5W & 1H, 5S, Kaizen, PDCA, Flow diagram, Histogram, Ishikawa Diagram / Fish Bone Diagram, Pareto Diagram, Scatter Diagram, Poka-Yoke, SMED, TPM, Quality Circle, Glass Wall Management, Mini Company Technique etc.

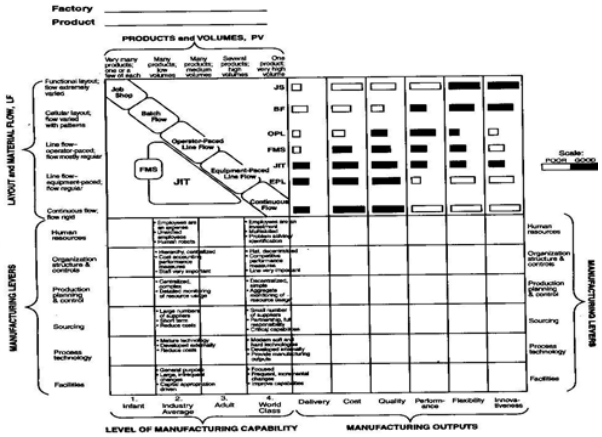
However, use of the above tools have become generic and we need TQM to be supplemented with newer concepts influencing the vision, mission and core values of the organization. Industry 4.0 implementation has to be blended with TQM approach in order that no resistance from people is envisaged during its process of implementation.

Evolution of the concept "Total Quality Management" : Traditionally, the entire onus of all the consequences of poor quality was vested on QA/QC department. Quality was treated as merely inspection job for which QA/QC department was held responsible mainly. Focus was only to segregate the bad products from the lot. Crosby (1986) strongly opposed the notion and argued that, quality problems are mainly symptoms, indicating the need to investigate the root causes which is the responsibility of all concerned departments. In fact, everyone is the contributor to poor quality and should be held responsible for the cost of poor quality. Quality should be considered taking the whole aspects of the organization into account. Failure to do so is one of the major reasons behind the unsuccessful implementation of TQM in many organizations. Deming (1988) advocated, extending the scope of quality beyond inspection. He strongly believed and argued for ensuring quality at the source instead of ensuring it through inspection. He proposed more proactive and comprehensive approach to ensure quality of the products and services. In fact, after his argument, concept of modern total quality management was actually put in place. There was a paradigm shift in the belief and perception from a very narrow scope to wider "everything" scope.

Methodology : This research article has been developed through primary and secondary research conducted jointly by a leading group of industry, supply chain professionals and supply chain operators from a developing nation (India). Respondents selected from a sample of twenty-five (25) organizations sampled through convenience sampling technique have been utilised for carrying out the research work and primary data collection.

Industry 4.0 initiatives may fail in a developing country like India if robust preparations are not undertaken as illustrated below:

- Organization Vision to be spelt out and is required to be linked.
- All the processes of the organization are to be re-visited to make those lean using lean technologies. Application of Industry 4.0 in a factory with wastes shall derail the initiative.
- Appropriate technologies of Industry 4.0 to be selected in phases based on an integrated template as shown below. Prescription of similar Industry 4.0 technologies in all organizational situations shall not work, particularly for MSME sector.



It is imperative for industries of developing countries like India to eliminate wastes in their systems employing lean technology and management before even attempting to introduce Industry 4.0 in their respective supply chains. Trying to implement IOT, AI and Analytics, Automation etc. in present state of things shall only make matters worse as inherent wastes present in the system shall be magnified and hence render the initiative ineffective and futile. So, the first step in Industry 4.0 implementation for supply chains shall be to employ and implement lean systems effectively, physically and in mind-set in order to prepare the platform for implementation Industry 4.0 technologies. With reference to the template (PV-LF Matrix) it is important to determine the current state of the emerging supply chain in a particular organization and thereafter to migrate to an appropriate level suitable for implementation of Industry 4.0 through rigorous process of lean implementation leading to reduction and possible elimination of wastes and wasteful practices through practising some very effective simple lean technology tools, like,

Kaizen (continuous improvement)
5S
SMED
Kanban

Just-in-Time (JIT)
Andon
Jidoka (autonomation)
Poka-yoke (visual signals)
Flexible manufacturing
Lean Quality Circle
Ishikawa Diagram (Fishbone Diagram)
Glass Wall Management (GWM)
Mini Company Technique (MCT)
Value Stream Mapping

Lean Six Sigma : After the organization has been successful in taking care of the waste elimination across its supply chain, the next phase would be to select appropriate technologies of Industry 4.0 to be applied to different domains of the supply chain in phases in an integrated manner. This is necessary for organizations in developing countries so that the technology most suitable and appropriate to the particular domain of supply chain suitable to the organization in question is effectively applied and implemented. Implementation of all technologies in an unthoughtful manner would not only be investment intensive but also impossible to absorb and adopt in the current system and context. Similarly, Industry 4.0 technology implementation may also vary across different kinds of industries or also amongst same kind of industries based on individual peculiarities.

A suggested roadmap for use of appropriate technologies in different supply chain domains for emerging supply chains in developing countries is presented:

Planning & Execution : The planning and execution phase in SCM focus on end-to-end process and maintaining a balance between supply and demand. Decisions are now more data-driven, and the integration of automated end-to-end data aggregation solutions will be a game changer in deciding more practical approach.

The integration and digitization of operations eliminates silos in enterprises, allowing decision-makers across functions to respond to disruptions in real-time. Whether it's a shortage of raw materials, adapting to a change in market dynamics or customer preferences, identifying (and nullifying) the root cause of inefficiency in day to day operations, or gathering market intelligence to plan for the future, a digital supply chain can be advantageous with minimal need for human intervention.

Supply chains with an effective ERP solutions and integrated monitoring and tracking solutions can handle day-to-day operations as well as strategic initiatives with ease, giving the intelligence and insight to be future ready.

Technologies appropriate in this domain may include Business Intelligence (BI), Artificial Intelligence (AI) and Big Data Analytics.

Procurement & Manufacturing : Customer demand, manufacturing and holding capacity, and the current supplier landscape are some of the factors that affect procurement and its operational overheads.

The integration of live demand data from points of sale, current performance and inventory data from manufacturing and holding facilities, as well as up to date information on in-transit raw material or inventory from suppliers can help streamline procurement and manufacturing operations to the point where buffer or safety stock is no longer necessary.

Industry 4.0 is all about digitization and the integration of monitoring, tracking, and analytics technologies to enable seamless SCM and improve operational efficiency — both now and in the future — for existing processes is extremely vital.

Technologies appropriate in this domain may include Big Data Analytics, Robotics, Simulation, Additive manufacturing – 3D printing, IOT, AI.

Logistics : Logistics & transportation management, by far, has the most to gain from supply chain digitization and Industry 4.0.

The automated real-time management of a large number of shipments and in-field assets like shipping containers is going to be the next big leap in improving productivity.

Real-time shipment tracking solutions will allow supply chain managers to optimize routes, fleets, and field asset utilization in real time, with the added advantage of automation to reduce the need for human intervention.

Automated logistics management systems improve responsiveness to changes that affect throughput, ETA, unnecessary overheads like fuel costs, and the ability to narrow windows of delivery.

Technologies appropriate in this domain may include (Internet of things (IOT), Automatic Identification and Data Collection (AIDC), Radio Frequency Identification Device (RFID) and Business Intelligence (BI)

Warehousing : Industry 4.0 warehouses will function as an autonomous entity, with automation handling the majority of tasks like space management, inventory tracking, and order picking. Simplifying or reducing labour-intensive tasks can boost efficiency and reduced operational overheads.

When coupled with end-to-end supply chain visibility solutions for inbound or outbound logistics, smart warehouses can anticipate the inflow of goods and space requirements, requisition assets like personnel or pallets, and update enterprise inventory holding and throughput levels in real time.

Warehouse inventory tracking and management systems coupled with other emerging technologies like Augmented Reality (AR) could also be an option to increase process efficiency.

Technologies appropriate in this domain may include Virtual Reality (VR), Augmented Reality (AR), RFID, AIDC,

BI, Robotics and IOT.

Conclusion : Industry 4.0 shall disrupt current state of Supply Chains for sure in developing nations. Question is how a company leverages the benefits to the fullest extent more so in a developing country not fully ready with 4.0 technologies as well as considering implementation in the given socio-economic environment. The process of implementation, therefore, should be in synchronization with the principles of Total Quality Management (TQM).

There is no "prescriptive recommendation" and the recommendations needs to be worked out based on the supply chain environment of the organisation under consideration.

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COMMODITY INDEX

Commodities	Days's Index	Prev. Index	Week Ago	Month Ago
Index	3027.8	3026.4	3013.6	2792.3
Bullion	6347.7	6347.7	6313.9	5225.2
Cement	2547.5	2547.5	2547.5	2563.8
Chemicals	1785.9	1785.9	1827.9	1827.9
Edible Oil	2109.8	2110.4	2044.2	1880.3
Foodgrains	2512.9	2512.9	2526.4	2532.9
Fuel	3024.0	3017.7	2924.9	2642.3
Indl Metals	1918.9	1918.9	1918.9	1918.8
Other Agricom	2362.0	2362.0	2382.1	2324.1
Plastics	1625.9	1625.9	1768.7	1688.8

Source: ETIG Database dated 26th June, 2020

FORECASTING AND INVENTORY BENCH MARK STUDY (Forecasting handshaking with Inventory), LEADING TO understand - FORECASTING AS AN INVENTORY MANAGEMENT TOOL

MD.ZIAUDDIN, B.TECH (MECH)
CHAIRMAN IIMM HYDERABAD BRANCH,
ziauddin1948md@gmail.com

FOREWORD : To day, "on goings " are going on. In simple words , one will question, whats going on- The answer is – Every body , to day, thinking, talking, telling, listening-" SUPPLY CHAIN ", it's a wakeup call in this COVID19 Era . Therefore, SCM domain shall start to streamline all Supply Chains to go well with "after effects of COVID19" . But, how ? – its now through " Forecasting hand shaking with Inventory " and vice- versa too. Hence, dealt hereunder about SCM's foremost activities ie Forecasting as an Inventory management tool through Forecasting and Inventory bench marking.

FORECASTING : Forecasting is said to be powerful, because it provides an intelligent and model-based 'glance' into the future. There is a common belief today that improving forecasting accuracy should definitely improve inventory levels.

Following are some meaningful critical thoughts to understand about "Forecasting as an Inventory Mnagement Tool" , to prevent stockouts and improve inventory levels, to go on with all supply chains uninterruptedly, as known to all SCM managers.

Two types of forecasts : The term "forecasting" is generally confused with planning, but it is a model of historically monitored data. The model can be expanded into the future, thus enabling to do predictions. However, with some level of **confidence** within every model, the evaluated predictions have a non-zero probability, being wrong.

Demand instability : Forecasting algorithms are based on minimizing residuals. However, this does not mean that the model explains the behavior of demand variability ie stable or with instability. It is also a fact that, that past events may not define the future, and vice versa. Actual demand may not be related with historical tendencies. Further , it is difficult to understand about what is the real demand potential in supply chain strategies.

Data restrictions : As predictions are closely related to historical data, there is no way to model the required quantity of incoming goods with **inadequate** historical data. Extreme events are also part of any business. However, forecasting is not tuned to include extremes, as such events are treated as outlier data, not to be ignored to avoid adverse impacts on forecasting.

It is enough., when? : Usually items tend to be segmented by seasonality, lifecycle spans, promotional scope, coherent specifics (demand of one item influences/ generates demand for the other item, e.g. printing machine and toner) and many more factors. Since there is no unique forecasting model to describe various fluctuations, the systems use many of them in order to support different combinations of factors.

Integration into Inventory strategies : There are many vital, critical reasons leading to serious disruptions in business, due to stock out: some changes in lead times, loss of a supplier or bulk discounts. In such situations, inventory works as a buffer to absorb these interruptions when the risk of a stock out arises. Hence, it is very important that inventory strategies are properly designed to have a structured inventory strategy.

Therefore, keeping in view the complex network and demand forecasting, one need to oversee inventory measures and supply-side insights on manufacturing followed by distribution performance and connected studies which reflected end to end planning and execution capabilities. Such study, generally uses data to explore strategies, decisions and implications related to growth, agility to resiliency and profitability. The analysis spans functional supply chain areas including design, plan, make and deliver, and across all planning horizons from strategic to tactical, operational and executional.

Following are the recognized **few takeaways ,** related to growth, agility/ resiliency and profitability- Supply Chains :

* Add and Cut Innovation : This is an important source of revenue , representing about only 20% of annual sales , but each new product has only half the revenue productivity of existing items. Balance growth through innovation strategies with strong governance, otherwise degrades item productivity, erodes planning, manufacturing and distribution performance, necessisitating more investments in inventory to keep the supply chain running.

*** Raise Performance of Existing Products :** This is very vital and not to neglect operational excellence initiatives that increase the sales productivity of existing items. Hence to adopt demand sensing capabilities to improve the productivity of existing programs of demand planning .

*** Drive Profitability :** Invest in improving agility, efficiency and resiliency as a catalyst for profitable growth. Agility better capture sales opportunities, maximize innovation strategies and increase item productivity across the entire

portfolio. Improved efficiency lowers cost to serve — including operational, capital investment and asset management costs — and raises item profitability across the entire portfolio. More resiliency enables better responses to any type of supply chain disruption.

*** Embrace AI :** Accelerate the use of AI/ML and receive more demand signals (including external data) as a key enabler of agility, efficiency and resiliency. For short-term horizons, sense demand by using real-time data so that forecasts reflect current realities on the ground. Make sure any investment in AI/ML for planning can encompass full business and solutions chosen, automatically publish forecasts to supply planning without human intervention — otherwise, meaningful benefits ca not be realized.

*** Make Inventory Work Harder:** Multi-echelon inventory optimization is said to be a proven way to improve inventory productivity and return on working capital, across the entire portfolio. If , one is serious about making capital investments in inventory work harder , it is advisable to use the combination of inventory optimization and demand sensing/ forecasting.

*** Think New :** For those on the demand side , to stop debating, which lag to measure and consider adopting the more appropriate measure of forecast error over lead time. This is the best practice by leading manufacturers for supply decisions at every horizon. This measure becomes possible once , one gains access to accurate daily forecasts from demand sensing.

*** Think Big :** To make SCM tools to proceed further without stopping at any level for End to End planning, which encompasses both operations and eco systems partnering . Agile and resilient planning starts by understanding external signals from distributors, retailers, B2B customers and consumers. On the supply side, it extends to understand the capacity and materials availability at all tiers of suppliers and contract manufacturers — for expected demand and big swings in either direction. Holistic, end-to-end planning that incorporates ecosystem partners is now recognized as best-in-class and is the key to unlocking the next level of profitable growth.

Forecasting bench mark and Forecast accuracy : The first step - for any meaningful forecasting benchmark program is to establish how easy or hard each business is to forecast. This is done using a naïve forecast, which is a simplistic, seasonally-adjusted forecast that does not require any investments in people, process or technology related to demand planning.

In the supply chain, however, forecast accuracy matters — especially for fulfillment of activities that depend on demand predictions. Given the scale of supply chain operations, even a small improvement in accuracy at this level can improve profitability by avoiding stockouts, reducing inventory overhead. Forecast Accuracy Depends on Business Context (Strategic/Tactical/Operational)- some findings are :

STRATEGIC-90%: Quarterly-Category-National { • Financial projections }

TACTICAL-82%: Bimonthly-Base Code-National {• Production planning, • Materials purchasing}

TACTICAL-71%: Monthly-Base Code-Location { • Inventory planning,• Production & packaging sequencing}

OPERATIONAL- 52%: Weekly-Item-Location { • Fulfillment, • Deployment, • Logistics execution}

The second step - In benchmarking forecast performance is to understand what time horizon and aggregation level is appropriate for the business decision at hand. As a best practice, leaders in manufacturing, establish strategies to have the best forecast possible for all horizons and consistently achieve the best business outcomes for any decision by any department at any level.

The third step - Forecasting- Demand planning : There is large disparity in the demand planning error between top-performing and lowest-performing companies. Some companies are better at forecasting because their business models make it easier. The demand planning forecast error is based on time-series analysis of historical shipments.

The fourth step – Forecasting -Demand Sensing : There is a lot of buzz about demand sensing, and for good reason. It is an essential part of building a more agile and efficient supply chain and an important step in the journey to forecast excellence. The term demand sensing is used liberally by vendors, which can make it challenging to understand the expected actual performance . The demand sensing solution matches all the following criteria:

- Use of multiple, real-time signals to create daily forecasts, reflecting current market realities.
- Use of AI/ML pattern technology, to process masses of big data and extract meaningful information.
- Fully automated system with self-tuning algorithms publish daily forecasts directly to the supply system for execution

SUPPLY CHAIN AGILITY AND INVENTORY PERFORMANCE : Increased portfolio complexity arising from constant innovation also has implications on manufacturing, distribution and inventory performance. Understanding the supply-side dynamics provides valuable insights to help companies build more agile and responsive supply chains. Supply Agility Cycle time is an important factor for production agility. It represents the time between production runs for a particular product and provides a measure of manufacturing flexibility. Shorter cycle times help companies better respond to unexpected changes in demand and more effectively use production capacity to capture new upside opportunities, avoid stockouts and reduce the overall cost to serve. It's an important supply-side capability in the agility toolkit.

Distribution Agility : Similarly, to ensure distribution agility, it is important to manage replenishment lead times, which represent the time it takes to replenish customer-facing distribution centers with finished goods either stocked at central locations or manufactured on the next run. Replenishment lead times also provide some understanding of fulfillment efficiency. Shorter lead times help companies better respond to volatile customer demand, capture growth and meet service commitments. Frozen schedules are typically many times greater than transportation and are therefore more important to shrink. Where to stock goods is a strategic decision with structural implications on agility and efficiency. Longer lead times

increase the likelihood of stockouts and expedites, which undermines revenue and profitability.

Inventory Productivity : Inventory is the lubricant that keeps supply chains running smoothly, buffering against uncertainties to ensure service. Safety stock is the largest component of inventory. This inventory protects against volatility in demand and supply.

Different Types of Inventory in simple words:

- **Safety stock:** Minimum inventory required as a safety margin or buffer to prevent stock-outs while meeting target service levels
- **Cycle stock:** Inventory required to fulfill normal demand over a specific period
- **Transit stock:** Stock in transit from one location to another
- **Ground stock:** Stock on hold for quality assurance, order picking and similar reasons
- **Excess stock:** Excess inventory arising from overly optimistic forecasts (positive forecast bias)

Inventory performance – Immediate way to get a step-change inventory performance — for all items, including those in the tai, is to reduce forecast volatility by sensing demand and using -Multi-echelon inventory optimization (MEIO), a proven way to improve the inventory productivity and return on working capital across the entire portfolio. MEIO using demand planning forecasts yields about a 17% reduction in safety stock compared with traditional single-echelon inventory management. But,using the combination of MEIO and the more accurate demand sensing forecast almost doubles the performance, cutting safety stock by about 28%. However, for improving inventory productivity it is worth to do both, ie, the combination of MEIO with demand sensing.

Having dealt MEIO above and its weightage on inventory productivity, it is apt to provide a brief on Multi-Echelon Inventory Optimization (MEIO)- The conventional way to set target safety stock levels is to use a simple rule of thumb for all items that is often based on a days-of-supply target. In contrast, multi-echelon inventory optimization creates mathematically optimal stocking levels for each item, raw material or component at each node of the end-to-end supply chain to determine the lowest possible system-wide inventory. Multi-echelon inventory optimization provides the same performance for new items as well. With innovation as the primary engine of growth for many companies, waiting months, quarters or even years to refresh inventory targets goes against best practices for creating a resilient and agile supply chain.

Having dealt all above, it is pertinent to have record of following Glossary to understand the concept of looking the Forecasting as Inventory management Tool (although the terms look, as well known):

Base code : A set of items that share a Universal Product Code (UPC) or Global Trade Item Number (GTIN).

Bias : Factor arrived by dividing the difference between total forecasts and shipments by total shipments. Positive and negative bias represent over- and under-forecasting respectively.

Cycle stock : The portion of inventory that is replenished in a warehouse periodically for fulfilling downstream orders

Cycle time : A key driver in the safety stock calculation. The average time between replenishments for warehouses and distribution centers, or the average time between manufacturing runs for plants.

Demand planning: Planning solutions employed by participating companies to create forecasts using a time-series analysis of historical data and augmented to reflect promotions as well as planner insights

Demand sensing : An advanced forecasting technique, uses machine learning to predict near-term daily demand based on current demand signals. Demand sensing is automated and self-tuning.

Excess stocks : Extra inventory carried due to over-forecasting actual demand. Excess stock is calculated based on historical forecast bias measured over total lead time.

Extreme oversell error : Percentage of volume for which shipments exceed forecasts by more than two times

Extreme undersell error : Percentage of volume for which forecasts exceed shipments by more than two times.

Forecast value-added (FVA): Difference in Mean Absolute Percentage Error (MAPE) between a planning system forecast and a naïve forecast, divided by the naïve forecast. Forecast value-added represents the percentage forecast improvement attained from investments in people, processes and technology.

Forecastability: Degree to which demand can be accurately predicted.

Lead time : A key driver in the safety stock calculation. Total replenishment lead time representing the average amount of time required to replenish inventory when an unexpected need arises.

Mean absolute percentage error (MAPE) : A common way to measure forecast accuracy. MAPE is the sum of absolute errors divided by the sum of shipments. MAPE is always positive.

Multi-echelon inventory optimization (MEIO) : Advanced technique that reduces inventory by mathematically determining the minimum amount of safety stock required at all stocking echelons in the extended supply chain to achieve customer service targets.

Naïve forecast : Forecast based on a seasonally-adjusted moving average. The naïve forecast provides a means to measure forecast value-added.

Safety stock : Inventory maintained to mitigate the risk of stock-outs due to uncertainties in demand and supply.

Shipments: Quantity of items shipped in physical cases.

Transit stock: Inventory in transit from one location to another.

Velocity: An item's rate of sale is its velocity. Sales velocity separates top movers from the tail.

(REF: Internet sourcing/ Study reports/ Research noting/ Net working discussions etc.)

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ASSESSING THE MATURITY LEVEL OF PROCUREMENT FUNCTION IN SUPPLY CHAIN

PALLIKKARA VISWANATHAN
N.C. MEMBER OF IIMM BANGALORE BR. vid_shy@yahoo.com

Procurement considered as a key partner in an organization, with dimensions, covering areas, which cover specific practices, policies,process, methods in supply chain. Procurement has the challenges of sourcing, strategy process, and organization structure, procure to pay, reporting, documentation, systems supporting of the supplier relationship management of the procurement department in supply chain.

Procurement is a function undergoing constant change, ideas methods, brings developed in cooperation with customer, consumer, and various suppliers in supply chain. Procurement maturity has to create a value for the organization, providing the necessary contingency across the organization, through a common barrier, raising the goodness of supply chain, performing through better leaning, and critical supply chain, providing a convenience, continuous improvements in supply chain, to address the changing in the workforce, in supply chain.

Procurement aim is to provide with an overview of the maturity level in procurement, with the input that make the work to be performed by procurement, with more efficient, highlighting the potential of future in values of development, with an inspiration of ideas for improvement through benchmarking with similarity of procurement of other organization. Procurement overview input inspiration is a form of platform forwarding of the potential improvement, improvement in areas that are highlighted with initiatives, objectives, which can substantiate procurement to bring to higher maturity level in supply chain.

Procurement implementation maturity level is also based on data base, the benchmark that propagates the maturity level in the field of procurement. Procurement benchmark is based on the analysis, compared with the understanding of the organization's maturity level in supply chain. Procurement in purchasing maturity level is to create, a driving value on business actively managing the standard by best practices, continuity in supply chain, using standard documentation, process, for easy accessibility across the organization, by the emerging with description, also increasing the responsibility of accessibility of process, of performing the activity, in an ad-hoc uncontrolled, and reactive manner in supply chain.

Procurement undergoes a type of maturity level, in which ad-hoc (necessary) level of procurement becomes the un-managed without a defined proposition strategy, since each of the organization, have considered to have their own approach toward the process in supply chain.

Procurement in supply chain should be on repeated level of maturity, with the experience being uniform process based on the practical experience, with the need for improvement in supply chain. Procurement should also be documented level, at the maturity level, confirmed with standardized, uniform system, with procedure, policy matters, to be documented in supply chain.

Procurement should be at the managed level, with a good maturity level, with the organization responsible for the placement of vision, goals, that are defined by the management of the organization in supply chain. Procurement should also be at the optimized level of management focus on achievement, at the best practices through a continuous optimization, reporting for attaining a maturity level in supply chain.

Procurement strategy is improving performances, eliminating unnecessary waste, spending, streamlining, the operations in procurement, trying to improve relations with supplier, increasing the negotiating power, with supplier strengthening supplier relationship, assigning purchasing decisions assisting maturity level, with the corporate goals as objectives in attaining maturity level in supply chain.

Procurement measuring the maturity level is to find out how close the achievement of the factor, and each of the aforesaid mentioned results in supply chain, the maturity level, saturates at the levels, novice (new performance), intermediate stage, advanced stage, expert stage, thus developing the relationship between the company size of procurement maturity level in supply chain. Procurement organization have a greater means to measure the performance, customer satisfaction, surveys conducted, vendor development surveys, employee feedback surveys, achievement of business goal, as internal performance, as the performance becomes measurable at the maturity level in supply chain. .

Procurement in order to gain organizational performance should best measure to compare an organization against another organization, considered as best-in-class, as an objective of such comparison will constitute to identify a bench mark in supply chain, which is likely to represent the standards, as the best practices for measuring the maturity level such as quality, value performance, in supply chain, thus comparing, and adopting the identified benchmarks to achieve improvement of maturity level in benchmarking in an organization in supply chain.

Supply chain sourcing in procurement process for projects, planning, may not have much effect, as they are handled on an ad-hoc basis, Supply chain sourcing has a maturity level, as projects are managed on a central based planning, as sourcing are strategically planned, which is considered to be a continuity, updated

of the category knowledge, spend information, with necessary feedback on sourcing process in supply chain.

In procurement sense sourcing maturity level is the progress of executing sourcing projects, as and when it becomes necessary, to be used in supply chain, as the organization establishes standard sourcing strategy process in procurement, as it becomes a necessary on the part for the organization in supply chain. Supply chain cost optimizations in projects, the purchasing or the procurement organization, are measured against the performance indicator, savings. Project cost reduction is to reduce cost, improve performance level, with organization, keeping the objectives of business sustainability, quality, time delivery, innovation, in supply chain.

Procurement maturity level is the best level of efficiencies, effectiveness in procurement organization, has at a given point of time, with an important detailed assessment of procurement functions, considered as a path for improvement, with comparison to the best practices, benchmarks, standards in supply chain. The purpose is to help organization to understand improve efficiency, effectiveness of the procurement maturity level function which can turn into a significant efficient savings in supply chain.

Procurement process maturity measurement, focuses on the concept of process capacity maturity, to access measure improve the organization, critical process, development of software, project management. Process is the ability to produce planned results, maturity is the effectiveness or capability in the specific process, which is usually described as the levels of effectiveness, or capability, also created by transformation of one or more domains of the organization process in supply chain, as it is an ad-hoc practice to a state of continuous improvement for implementing ritual practices for one or more domains of organization process, as it contains essential elements of effective process in one or more disruption, in supply chain.

In supply chain performing procurement maturity level assessment will give a realistic appraisal, towards procurement in supply chain for the organization. Traditional procurement was in the category of using bid-in-buy process procurement, where purchasing the consideration was mainly the price, most of which consists managing the inventory, processing purchase order, renewing contract in supply chain.

Procurement is augmented with adding value to the organization, as the strategy of sourcing, which give importance to pricing as a concept in supply chain, thus optimizing the relationship with good supplier, resulting in better visibility, by getting in more data, setting up profit measures to reach the maturity level in supply chain.

Procurement today operates under a better strategic role in the organization, operating under a continuous improvement which allows staying at the cutting edge, emerging technology, bringing better coordination in supply chain, by reaching the maturity level, with realistic goals, in the area of improvement, thus transforming the procurement function in supply chain.

Procurement evolution undergoes maturity level, at the basic level; it is the quality with longer term contracts, leading to higher volume with inventory, transportation measurement in supply chain. Procurement undergoes maturity level, at the moderate development level with ad-hoc supplier, better customers, cross functional work force, optimization of suppliers, customers having cross location of international locations in supply chain.

Procurement undergoes maturity level at the limited integrated level that will go into global sourcing, distribution, supplier development, standardization, having full demand over the flow of inventory systems in supply chain. Procurement at the fully integrated maturity level, supply chain focus on customer more externally, with more information being comprehensive, to fulfill service, suppliers, involvement of suppliers, with in sourcing, outsourcing, to minimize core complexities in supply chain.

Procurement in supply chain in information technology becomes associated with maturity level in synchronizing the domain maturity in stages, based on capability, as developed by the software in information technology. Synchronizing at the maturity level is listed as organization, the process, structure, workforce, monitoring, control, which the management process in an organization with the type of culture, the type of people, thus forming a part of the human resources management with information technology application in the organization in supply chain.

Supply chain procurement function is being considered as main domain is identified with factors of implementation of information technology, procurement, identifying management commitment process, re-engineering, as per the conditions to discuss the impact, and anticipated benefit of e-procurement for the organization, through process, re-design, with e-procurement integration to maintain maturity level in supply chain. Information technology is taken into account in the procurement business, in planning, structural organization, process organization, human resources controlling to maintain the maturity level in procurement in supply chain.

The measurement of procurement is also considered to be an important in procurement performance with proper identification, operational performance, indicators like cost for acquiring quality of purchase of goods, services, delivery time, which include supply chain with wide benefits partnering for smart new rates increasing the effectiveness of communication as it becomes more prospective to maintain maturity level in supply chain.

Supply chain recognizes procurement function increasingly strategic, with an improvement function arising out of alignment, framework based on the performance of the procurement activities in supply chain, and also a single maturity level strategy, policy, monitoring, controlling, organization process, people with culture, information technology with the respect to performance attaining the complete maturity level in supply chain.

Supply chain is found to correlate with maturity alignment of business on one hand, procurement on the other, which can be used by the organization to move the function of procurement to maturity level in supply chain.

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INDIAN INDUSTRIES FACES MANPOWER SHORTAGE AFTER UNLOCK

LALIT RAJ MEENA
meenalalitraj1@gmail.com

COVID 19 started its impact on Indian Industries in Mid- march 2020. To curb the impact of this deadly disease, the Government imposed Lock down 1,2,3 &4 . In european and other countries the impact of COVID 19 started little early in end of december 2019 or January 2020. World wide all industrial, educational, health, hospitality, travel & Tourism were closed down world wide including India. Labor like casual and daily workers were the most affected financially. Due to closure of Industries and other Institutions most of the manpower was jobless and were facing the problems of two time meal. In-spite of the Instructions from the government to provide meals and payment of wages, most of the industries specifically MSMEs were not in position to pay the wages for the closer time.

Actual problem started a few days after the lockdown. The Labour wanted food, wages and movement from their workplace to the home town. All the mode of transportations were closed. A fear came in the mind of the labour that they will die out of hungry as no one is there to take care of them. With this fear they started movement in masses by foot with a targeted journey of 1000 to 2500 KM, which was not an easy task.

Government of India and states did not kept this kind of situation in mind before the imposition of lockdown and no arrangements were planned for such a mass movement. By the time the government started planning, it was too late. Finally the state government as well as the central government with the help of Indian railways provided the transport for movement of labour to their native state. Though it was a difficult task but the Indian Railways completed the task successfully.

By the time the movement of Labour completed to their native place, the Government of India started the unlocking process and Industries were asked to open with certain restrictions and guidelines. The large scale industries started its operation in one shift or more as they were having a permanent workforce . But they are also unable to operate up to their full capacity due to lack of trained manpower , which has left their native place and reluctant to return back due to fear of CORONA. Further no conveyance to return back to their workplace. Though in India we have lot of unemployment but still we are short of trained and skilled manpower.

Locally a lot of unemployed youth are available in large numbers, but all are untrained and it is very much difficult for industries to train them and put them on work. By the time their training is completed, industry will not be able to work with its full capacity.

The state governments are enrolling the nigrents to provide them job locally, even some states started imposing certain norms if the residents of a particular state gos out for work in other state and at same time they are not in position to provide employment to all the work force returned from other states.

Now its is assumed that even after opening of the mode of transports ie. rail and road transport will take another six months to return the trained manpower to the place of work with an uncertain future, whether he will get the employment with his previous employer or he has to search for the new job. After the closer certain industries are closed, some do not find the market to sale their products, some do not get the raw materials. Our travel, tourism, hospitality, education and MSMEs are the most sufferers.

Now the state as well as the central government are required to act together to bring back the trained workforce to their place of work. Further it is a supply chain process. In the state of Rajasthan the Marble Industries, Mineral powder and cement industries are the most sufferer. The construction activities are stand still due to lack of manpower . Cement industries are working on their 50% capacities, Marbal industries are at all time low of 20% production, Mineral industries are at about 35-40 % of their capacities, with three reasons.

Shortage of workforce

No customers to by the products

Export of Mineral products is at stand still.

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SPUR CREATIVITY AND THINK DIFFERENTLY TO TURN A NEGATIVE GRIPE SESSION INTO A POSITIVE BRAINSTORMING SESSION

SN PANIGRAHI, PMP, PROJECTS, LEAN SIX SIGMA, GST & FOREIGN TRADE CONSULTANT & TRAINER
snpanigrahi1963@gmail.com

Brainstorming is a creative group problem-solving technique and a great way to gather ideas that involves the spontaneous contribution of ideas from all members of the group. This Technique is sparingly used in almost all Projects.

Reverse Brainstorming, on the other hand, flips traditional brainstorming techniques upside down, allowing you to **approach complex problems from a different perspective**. Instead of trying to solving a problem, **Reverse Brainstorming generates ideas to make the problem worse**. **Then, you reverse those ideas to discover new ideas for solving your original problem**.

Ordinary brainstorming asks participants generate Ideas to solve problems. Reverse brainstorming asks participants to come up with great ways to **cause** a problem or **Create Obstacles to the Objective**. It Start with the problem and ask "how could we cause this?" Once you've got a list of great ways to aggravate problem, you're ready to start solving them.

Regular brainstorming will often take you in many different directions at the same time, which often leads to wasted time as it is easy to drift away from the original problem. Reverse Brainstorming, however begins by clearly defining the problem and writing it down on a sheet of paper. The '**reverse**' aspect comes from the next step which is to phrase the problem or issue the **opposite way around**, that is **reverse the problem to focus on the opposite of what you want to do.** This Triggers **Negative Comments to Find Positive Solutions.**

Reverse Brain Storming - Process:

Following Steps are Involved in this Process

- **State the Problem**
- **Reverse the Problem**
- **Generate Ideas on the Reverse Problem**
- **Reverse the Ideas**
- **Evaluate the Ideas & Find Solution**

Example of How to Reverse the Problem : For Example the Problem Statement (Objective) is "How to Increase Sale", in the Reverse Brain Storming it is "How to Decrease Sales"

Some more Examples are :

Once you stated Reverse Statement, then brainstorm the reversed problem in order to come up with as many ideas as possible, even though they will have the an entirely detrimental effect on the original problem. After you have a list of ideas on Reverse Brain Storming, you then reverse those as well and apply them to the original problem.

Reverse the Ideas: Next Step is to Reverse these Ideas and Apply them to the Original Problem. Once you've Collected all those great ideas for Reverse Problem Statement, work with your team to reverse each of the Ideas to find Solutions for Original Problem. Some Examples are Exhibited here:

Once you've done your **bad ideas back into good ones**, you can now analyse them to determine which are the best. With your team, go through each idea and prioritize them in whatever way you see fit.

Reverse Brainstorming is a Powerful Technique to **spur Creativity and Think Differently**. It is a great way to tap into Negative Feelings & Comments, Hostility, Frustration, and Anger, Deficiencies & Defaults as a tool for Positive Problem Solving. The opposite of the answers you found during your Reverse Brainstorming session is likely to be something that can be seen as a Creative Solution to your original problem. By deliberating on Reverse Problem around, you can see the issue from a **New Perspective** – then, when you return to the actual issue, practical solutions may be clear. It can also be a good way see a process, product, or service from a **new and different point of view**.

When you find that you are stuck on an issue that is particularly Tricky, Complex and Difficult to find Solutions through traditional methods, try putting this Reverse Brainstorming into action to see what it reveals. It can become a process of discovery, as participants begin to raise Issues and Problems that may have been invisible to management but are major roadblocks for Achieving Organizational Goals. Reverse Brainstorming is the best tool available that can **turn a Negative Gripe Session into a Positive Brainstorming Session**.

The Details are Available on YouTube @ below Link

https://www.youtube.com/watch?v=UUFfWl_AarI

Also can be Viewed on SlideShare @

https://www.slideshare.net/SNPanigrahiPMP/reverse-brainstorming-a-creative-group-problemsolving-technique-for-complex-problems-by-sn-panigrahi

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DGFT to launch new digital platform for import-export code related services on July 13

THE USERS WILL BE ABLE TO MONITOR THE STATUS OF THEIR APPLICATIONS AND THE PENDING OBLIGATIONS THEREOF. THESE NUMEROUS FEATURES SHOULD SIGNIFICANTLY BENEFIT THE TRADE COMMUNITY.

KIRTIKA SUNEJA

The Directorate General of Foreign Trade (DGFT) will launch a new digital platform on July 13 the first phase of which will cater to the services related to the issuance of Import Export Code (IEC), modification, amendment processes along with a Chatbot (a virtual assistant).

The IEC is mandatory for companies and businesses to start a business that deals with import and export. The platform is aimed to help traders electronically file their application related to IEC, various . exports schemes such as advance authorisation and Export Promotion Capital Goods (EPCG), monitoring the status of the application and raising queries among other services related to the Foreign Trade policy.

"Other online modules relating to Advance Authorisation, EPCG, and Exports Obligation Discharge which are part of next phase will be rolled out subsequently after the first phase stabilizes," DGFT said in a trade notice.

The users will be able to monitor the status of their applications and the pending obligations thereof. These numerous features should significantly benefit the trade community.

Source : DGFT

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EARNED VALUE

RISHI RAJ, IIMM MEMBER
ME IN INDUSTRIAL MATERIALS & METALLURGY
rishi_jangra@yahoo.co.in

A. Introduction : Top management of the company is not interested in lengthy daily progress reports or minute to minute updates. They need key information to help them visualize the money spent on the project and the value of the work completed.

According to the NASA Headquarters Library, the first version of Earned Value Management (EVM) was developed by the Defence Department (DoD) to track its programmes. Since 2005, EVM has been a part of general federal project risk management. These days Earned Value Management is a requirement for US government contracts.

The traditional method focuses on planned and actual expenditures, while Earned Value Management focuses on actual accomplishments and gives an insight of the project. Through the traditional method, it was not possible to understand the relationship between the completed work and the money spent.

In Earned Value concept, the data is converted to a single unit of measure so that planned and 'actual' cost and schedule data can be compared literally side by side.

EVM keeps an eye on deviations from any of the mentioned performance measurement baselines. It tracks project's performance and finds the potential risk areas. **EVM** can answer analytical and forecasting questions such as:

- Is the project ahead of or behind schedule?
- When is the project likely to be completed?
- Is the project currently under or over the budget?
- How much is the project under or over the budget at the end?
- What is the remaining work likely to cost?
- What is the entire project likely to cost?
- How efficiently resources are used?
- How efficiently are project team members using their time?

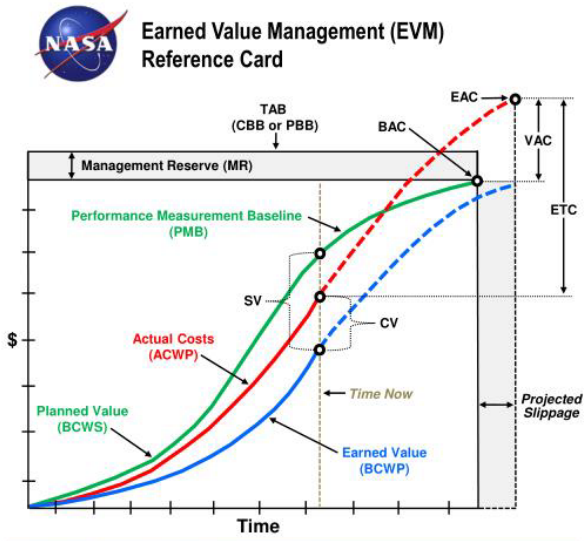
EVM is designed to integrate cost estimation, schedule development, system development oversight, and risk management. It compares the value of work accomplished in a given period with the value of the work planned for that period. It serves as a means of analyzing cost and schedule performance. By knowing what the planned cost is at any time and comparing that value to the planned cost of completed work and to the actual cost incurred, analysts can measure a project's cost and schedule status.

B. Analysis

The first step is to define the work and breakdown the activities involve. The second step is to assign a value, called planned value (PV), to each activity. This value can be in units of currency or labour hours and is a part of the total budget allocation of the project for that particular deliverable. The third step is to define "earning rules" for each activity. This simply means how the progress of each activity is measured. The final step is to execute the project according to the plan and measure progress.

Earned value is used to analyze the project performance, calculate the variance for schedule and cost and indicates where the project stands in comparison to the estimates calculated earlier for this point in time.

In common practices, EVM also involves plotting the values on a graph in order to help stakeholders concerned to visualize the progress and the health of the project.



C. Terminologies & Methodology

1) **Planned value (PV),** also known as **Budgeted Cost of Work Scheduled (BCWS),** is the approved budget for the **work scheduled to be completed** by a specified date.

2) **Earned Value (EV)**, also known as **Budgeted Cost of Work Performed (BCWP)** is the approved budget for the work actually completed at site by the specified date.

3) **Actual cost (AC)**, also known as **Actual Cost of Work Performed (ACWP)** costs actually incurred for the work completed by the specified date.

4) **Variances (Favourable is Positive, Unfavourable is Negative)**

- **Schedule variance (SV):** The difference between the amounts budgeted for the work you actually did and for the work was planned to do. The SV shows whether and by how much work is ahead of or behind the approved schedule. If the schedule variance (SV) is negative, project is behind schedule.

Schedule variance (SV) = BCWP - BCWS

- **Cost variance (CV):** The difference between the amount budgeted and the amount actually spent for the work performed. The CV shows whether and by how much project under or over your approved budget. If the cost variance (CV) is negative, project is over budget.

Cost variance (CV) = BCWP - ACWP

5) Performance Indices (Favourable is > 1.0, Unfavourable is < 1.0)

- **Schedule performance index (SPI):** The ratio of the approved budget for the work performed to the approved budget for the work planned. The SPI reflects the relative amount the project is ahead of or behind schedule, sometimes referred to as the project's schedule efficiency. You can use the SPI to date to project the schedule performance for the remainder of the task. e.g. SPI = 0.8 means the project 20% behind schedule.

Schedule performance index (SPI) = BCWP / BCWS

- **Cost performance index (CPI):** The ratio of the approved budget for work performed to what you actually spent for the work. The CPI reflects the relative value of work done compared to the amount paid for it, sometimes referred to as the project's cost efficiency. You can use the CPI to date to project the cost performance for the remainder of the task. e.g. CPI = 0.9 means the project is 10% over budget.

Cost performance index (CPI) = BCWP / ACWP

Performance Measures		Schedule		
		SV > 0 & SPI > 1.0	SV = 0 & SPI = 1.0	SV < 0 & SPI < 1.0
Cost	CV > 0 & CPI > 1.0	Ahead of Schedule Under Budget	On Schedule Under Budget	Behind Schedule Under Budget
	CV = 0 & CPI = 1.0	Ahead of Schedule On Budget	On Schedule On Budget	Behind Schedule On Budget
	CV < 0 & CPI < 1.0	Ahead of Schedule Over Budget	On Schedule Over Budget	Behind Schedule Over Budget

6) Predicted future performance

- **Budget at Completion (BAC)** — also known as the project/work budget, that is the total amount of money originally planned to spend on the project/ work

- **Estimate at completion (EAC)** — as the project goes on, there may be variations into the actual final cost from the planned final cost, EAC is a way to project/ estimate the planned cost at project finish based on the currently available data. The following formulas can be used to calculate EAC based on which information and conditions given in the question:

o **EAC = BAC/CPI :** If we believe the project will continue to spend at the same rate up to now

o **EAC = ACWP + (BAC-BCWP) :** If we believe that future expenditures will occur at the original forecasted amount (no more delays of the same kind in future)

o **EAC = ACWP + [(BAC-BCWP)/(SPI*CPI)] :** If we believe that both current cost and current schedule performance will impact future cost performance

- **Variance at Completion (VAC)** — the variance at completion, i.e. the difference between the new estimate at completion and original planned value

o **VAC = BAC – EAC:** Negative if over budget, and positive if under budget.

- **To Complete Performance Index (TCPI)** — the efficiency needed to finish the project on budget, it is the ratio between budgeted cost of work remaining and money remaining

o **TCPI = (BAC-BCWP)/(BAC-ACWP) :** Use this equation if the project is required to finish within BAC

o **TCPI = (BAC-BCWP)/(EAC-ACWP) :** Use this equation if the project is required to finish within new EAC

- **Estimate to Complete (ETC)** is a measure of the cost you now expect to spend, in completing the project.

o **ETC = EAC – ACWP**

- **Variation at Completion (VAC)** The variance of total approved budget for the work and expected cost.

o **VAC = BAC – EAC**

D. EXPANANTIONS

Definition	Calculation	Analysis
Total budget	BAC = ☐4000	The total planned cost for the project is ☐4000
Value of the work that should be done	BCWS = ☐3000	After 3 day, 3 Boards were to be completed
Value of the work that is done	BCWP= ☐2500	2.5 Boards are completed (each Board is worth ☐ 1000)
Actual spend to complete the work	ACWP = ☐3250	Total spent each day (☐ 850, ☐ 1200, ☐ 1200)
Amount that the project is ahead/behind schedule	SV = BCWP - BCWS SV = ☐2500 - ☐3000 SV = - ☐500	Negative SV indicates that the project is behind schedule
How efficient the team is in completing the work	SPI = BCWP / BCWS SPI = ☐2500 / ☐3000 SPI = 0.83	SPI less than 1 indicates that Ne team is less efficient in completing the work than projected
Amount of budget deficit or surplus currently	CV= BCWP - ACWP CV= ☐2500 - ☐3250 CV= - ☐750	Negative CV indicates that the project is over budget
Cost efficiency of the work completed	CPI = BCWP / ACWP CPI = ☐2500/☐3250 CPI = 0.77	CPI less than 1 indicates a cost overrun
Expect total cost at the completion of all project work	EAC = BAC/CPI EAC = ☐4000/0.77 EAC = ☐5200	If the current cost efficiency is maintained, the total spend will be ☐5200, exceeding the BAC
Expected cost to complete all remaining project work	ETC = EAC - ACWP ETC = ☐5200 - ☐3250 ETC = ☐1950	☐1950 will have to be spent to complete the remaining work
CPI that must be maintained to complete on plan (BAC)	TCPI = (BAC-BCWP) / (BAC- ACWP) =(4000-2500) / (4000 - 3250) =2.0	TCPI of 2.0 indicates that team's cost efficiency must improve from 0.77 to 2.0 to complete on plan. Significant increase unlikely
Amount that the project variance	VAC = BAC – EAC = ☐4000 - ☐5200 = - ☐1200	☐1250 will have to be spent more

E. Conclusion

Earned value is a fundamental tool that significantly helps to understand how the projects are performing. EVM contributes to Preventing scope creep, Improving communication and visibility with stakeholders, Reducing risk, Profitability analysis, Project forecasting, Better accountability, & Performance tracking.

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VUCA – A WAKE UP CALL FOR SUPPLY CHAIN

CHIRAG KALARIA, PROCUREMENT PROFESSIONAL - AMUL INDIA
chiragkalaria@live.com

Introduction : The world has become a global village where demands and supplies are continuously changing and sourced from multiple locations. Such dynamic situation can be termed as VUCA. It stands for Volatility, Uncertainty, Complexity and Ambiguity. This word has been coined by military post cold war and used by them to describe the conditions in the world which are VUCA. Later on this word has been adopted by industries and Supply chain professionals as well.

The VUCA term became increasingly interesting to the leaders who seek to operate their businesses efficiently and effectively. It also relates to the geopolitical landscape evolving on an international scale, while as Brexit unfolds in the UK and EU, it's hard to gauge what's going to happen in either the near or long-term future. The 4th industrial revolution is taking hold, transforming the nature and pace of our working environment and processes. We are seeing an increasing number of disruptor businesses that are changing traditional supply chain models and relationships.

You can very much relate the same as the world is passing through one such critical VUCA phase in the form of COVID-19 outbreak wherein all conventional rules of industry, economy, globalization, inventory management, supply chain management and almost everything have been changed or stands irrelevant.

Supply chain operations are already complex in nature and quite interdependent. Further, VUCA has added new challenges in the same and that's why VUCA is a new wake-up call for Supply Chain fraternity.

Reference to previous articles : For detailed understanding on Volatility, Uncertainty, Complexity and Ambiguity (VUCA), refer my article namely "VUCA – The basics of dynamic global mindset" and to understand what leadership qualities required to leading the organization in VUCA world, refer my another article on "Leadership – The VUCA Perspective" It will help you to understand VUCA concept and its requirement in better manner.

Brief of Supply Chain : Conventional organization charts were initially having departments like Planning, Procurement or Purchase, Inventory Management, Stores, Warehousing, and Logistics on the board, but there was no "Supply Chain" phrase was there. The phrase 'Supply Chain Management' was originally coined by Keith Oliver in 1982 and later it gains popularity as an umbrella term which encompasses the end-to-end aspects of Finance, Operations, Development, Sales, Manufacturing, Distribution, Customer Management, Supplier Management, Technology and IT departments.

In simple terms, Supply chain management is an important tool for managing product or services from its raw state to finished state and managing after sales services. It is principally concerned with the flow of products or services, funds and information between supply chain partners. Companies are thinking about how they cope with this volatility and uncertainty in the supply chain so that they can respond profitably. Doing so means not only product innovation, but supply chain innovation too; focusing on how new products are brought to market.

How VUCA world affects Supply Chain?

1. **Challenges to Conventional approach:** The industry's conventional approach of predicting future demands by observing past trends by applying tools like statistical modelling and forecasting techniques are not as accurate as it used to be. At the same time, business and consumer expectations are changing; stakeholders across the wider production and distribution supply chain want things to happen more quickly and efficiently than ever before, and there is little room for failure.

2. **Demands Initiative and Innovation:** The changed scenario means the indicators around how we operate are moving – and it's putting Supply Chain function in centre position. **Initiative** and **innovation** are now essential for businesses to meet these challenges and evolve their commercial strategies in line with the new operational landscape.

3. **Wise use of Social Media and Communication**: In today's digital era where social media allows opportunities and risks to be shared across regions and time zones. Consumers and stakeholders can therefore see and react to changing circumstances within seconds. As much as possible, we need to be ready to deal with their reactions, and make sure they are aware of the changing world. It's about managing expectations. There should of course be a continual focus on developing new ways of working that allow you to maintain service levels and keep up with the pace of change. However, there should also be clear communication around how changing trends and seasonality are affecting the business, to help ease pressure.

4. **Preparedness for consequences of unpredictability:** It's also important to encourage a sense of reason. It's about accepting that even the most advanced new forecasting methods won't provide the same level of accuracy as we could give

in a more stable context. Instead, businesses should adjust their strategy – focusing less on the relative importance we place on forecasting as a skill, and more on the tools you have within your business to help deal with the consequences of unpredictability.

VUCA demands insights on the possible room for opportunities and then undertaking respective measures to reduce, reorganize, rethink strategies on how to operate profitably in dynamic environment. It is to insulate organization's processes to make them more reliable and produce desired results while it scales up in its operations.

Common Problem of Supply Chain Manager in VUCA World: Facilitating operations at the optimum level of inventories, reduction in landed cost of materials / services and improve variable lead times through global outsourcing/multi-sourcing. The need of an hour is an increased transparency and visibility into processes which are required to make informed decisions while integrating manufacturing and external trading partners like third-party delivery vendors, stockists, retailers etc.

Amongst all 4 components of VUCA, Volatility is the active ingredient whereas uncertainty, complexity, and ambiguity are largely effects of the same. Though complexity can add to the volatility, uncertainty, and ambiguity. Globalization is the driving force of demand volatility… which is in turn driving product complexity… which, coupled with outsourcing, is driving supply chain complexity.

Supply chain managers love predictability. Unfortunately, today's global market is anything but—it's VUCA (volatile, uncertain, complex, and ambiguous). Companies in all industries have to carefully strategize to be ready for changes in the market and keep everything moving forward.

What shall be possible response from Supply Chain Expert to tackle VUCA?

Empower frontline SCM Managers for decision making: One of the ways to tackle this new world order would be to permit frontline managers to make fast-track decisions instead of waiting for approvals. Management shall ensure increased bandwidth and authority without the need to escalate through formal time-consuming channels. Real-time monitoring and alert-based decision making will be a key to achieve the same.

Adoption of Innovative Technology: Technology has been one of the biggest disruptors in this sector which lends an important hand to a largely scattered and unorganized industry especially in India where players like Sendit, Rivigo, Blackbuck finding traction and have shown market value through a renewed focus on technology concerted decisions by infusing it in the supply ecosystem to develop proprietary solutions using data analytics, cloud chain computing for forecasting and tracking systems to revolutionize logistics which benefits the entire value chain by making the whole process leaner. According to research conducted by QY Research Reports the increased adoption of cloud technology by various enterprises is the prime factor for the significant growth of the market for supply chain analytics around the globe and implementing an emphasis on digital data-driven decision making.

Supply chain analytics: The key aspects of the supply chain would be impacted include machining, insights, visualization and security which will help in capturing and integrating supply chain data to obtain meaningful insights and provide business intelligence required to flourish and contribute to the economic growth of the organization and our country. This leads to a cascading effect which not only benefits the supply-chain but the clients associated with the value chain seeking similar services to invest in product diversification or open up new markets.

Restructuring Logistics to improve service levels: Logistics is going to pave the way for the future with customer delight heavily dependent on faster and safer deliveries, requiring unimaginable turnaround times coupled with real-time status updates and performance inputs since the last mile deliveries are expensive, kills profits and make or breaks your customer experience through the brand interaction journey. To give superior value for money for your partners, it is imperative to win the loyalties of the customer by ensuring optimum service levels by ensuring a renewed focus on value addition like cost reductions, just-in-time capabilities, getting products to store shelves faster, new methodologies, and automation.

Amazon is one of the stalwarts of the industry showing how it's done to the rest of the world. Amazon has showcased time and again that they are the undisputed pioneers of this space by depicting unparalleled levels of innovation from warehousing to inventory management to delivery.

For example, a big part of the Warehousing success arises from the strategic location near metros or population hubs. If the demand permits then even mini-warehouses are set up to cater to smaller areas. For delivery, the omnipresence of Amazon to leverage more traditional to high tech delivery mechanisms has ensured a plethora of options for customers to choose and create deep loyalty towards their subscription-based service Amazon Prime to drive repeat purchase behaviour and offer convenience.

From Drones to Amazon-branded trucks to tie-ups with UPS/FedEx has allowed the Seattle based company to push out the product in lightning fast times. Embracing technology by introducing robotics and automation to reduce stacking and storing times has made the process a lot cleaner and efficient freeing up funds, time and space with unprecedented speeds.

Apart from abovementioned measures, one has to look forward to implement latest technologies like Machine learning algorithms, Internet of Things (IoT), Big data analytics, Artificial Intelligence (AI) etc which may help to realize business value, significantly impact costing and increase efficiency. Improvements on the go and Agility will be the new fundamentals to drive growth and competitive advantage finding high priority on the list of long-term agendas for any organization to address the VUCA world.

Supply Chain Management in VUCA world – Global Scenario

What sort of conditions is considered as VUCA in global scenario?

Lets recollect as Brexit, China's impact on world economy in the form of Belt and Road Initiative (BRI), China and USA Economic cold war of duties, Economic and political agitation, Right wing politics in rise with the leaders like Donald Trump, Xi Jinping, Narendra Modi, Netanyahu, Putin and Theresa May which has induced feeling of Nationalism in the country which works as avert force to Globalization.

Many of such leader's policies and actions of USA, India, China and Britain etc has increased Volatility, Uncertainty, Complexity and Ambiguity in global economics and ultimately impacts on Supply Chain. Further, all countries' economy are interlinked due to latest trend of outsourcing of work at the countries were labour and other resources are cheaper. Due to this, entire world economy has faced issue when Vuhan of China hits by Covid-19 outbreak.

Further, USA's Donald Trump has implemented the policy of "America First" has put the world in the backward mechanism from globalization to regionalization. The same has been implemented in India by "Make in India" concept. Due to such concepts Supply chains will have to adjust. Organizations with global supply chains are realizing that regionalization makes sense, because costs and risks are reduced and speed to market is faster"

According to Terri Hiskey, President of Global Product Marketing for Manufacturing at Epicor Software,

Having a solid supply chain strategy to navigate supply chain disruption is crucial — both to offset the impact of tariffs as well as handle the inevitable and seemingly myriad geopolitical disruptions, natural disasters, and transportation challenges

"Organizations need to put in place new short- and long-supply chain strategies. Supply chains that have been designed to function in an age of globalization are now under tremendous pressure to be made more localized products to minimize trade conflicts. While many organizations have seen benefits in consolidating suppliers in recent years, many are now looking to establish multiple suppliers in different locations and with different delivery routes. While this may increase costs and operational complexity in the near-term, it can be advantageous to mitigate disruption in the long-run and support growth.

Following steps may help to adjust Supply Chain to today's business environment:

- **Assess your supply chain state of affairs**. Quantify exposure for the extended supply chain by material, country of origin, and financial impact.
- **Calculate key considerations**. Evaluate inventory policy, sourcing modifications, and commercial terms. Consider where and when multiple sourcing options make sense.
- **Review as situations warrant**. Ensure scenario planning is done periodically.

Strategic use of technology can empower organizations in the efforts outlined above. Using technology such as Enterprise Resource Planning (ERP) and Supply Chain Management (SCM) systems to support supply chain operations is a solid step to improve visibility and flexibility. … These systems are increasingly being augmented with Artificial Intelligence (AI) which can be especially beneficial in helping detect fast-moving trends and look for patterns from which to discern insights.

Amazing Examples of Supply Chain

1. Toyota – Supplier Symbiosis: Toyota has developed a very unique and discrete manufacturing supply chain with the help of key Keiretsu suppliers. Keiretsu is a Japanese word that indicates cross holding of businesses and is not only a supply chain risk reduction strategy but also enhances supplier competitiveness in terms of cost, quality and delivery. It is a symbiotic relationship in which the Toyota(OEM) invests time and resources to develop the supplier capability to meet its requirements, whereas the supplier benefits by way of having "assured business" and hence can "never go wrong" (Reduced Volatility). It is this close collaboration that helps the supply chain to achieve reliability (on time in full), responsiveness (scheduled deliveries), agility (components development), Just in Time Inventory and an optimum ROCE (Return on Capital Employed). This mechanism has make Toyota able to reduce most of the component inventories upto Zero as such components are delivered on same date of demand only. Collaboration and communication are the underlying drivers behind such a robust supply chain.

2. Scotch Whisky – A continuous flow line process: The Scotch Whisky supply chain has a very long value chain and the key challenge is to forecast what would be customers' preferences will be 20 or 25 years later, particularly keeping in view that there are numerous SKUs and flavours. Sourcing professionals are tasked with not only getting the right ingredients (which is just 20% of the value they can add) but also have to ensure that they secure the right wood, 'casking', wood treatment and warehousing contracts (that add 80% value to the product). Thus, the Oak selection (for the casks), the drying lead times, heating of wood (toasting or charring etc) and warehousing techniques are all factors that influence the creation of the required flavour (developed internally, and not added) in the whisky. Due to the fairly long lead times, the elongated value creation timelines, and the uncertainties that affect the exact forecasting and response times to meet customer demands, some organizations have taken recourse to 3PL logistics providers to manage the value chain. This helps to increase forecasting accuracy, reduce inventory and provide greater agility. This example is a Continuous Flow Line process. However collaboration (that helps to communicate effectively and anticipate risks faster) between supply chain players is the only way to reduce VUCA risks in both cases.

3. Telecom Network space - Managing Reverse Logistic Supply Chain : Telecom Network Space has created an amazing example of Reverse Logistics. The power of collaboration for managing risks took central role in managing Plug-In-Cards (PICs). PIC is an electronic chip with surface mounted devices such as capacitors, transistors and resistors. The PICs value chain consists

of Source, Return, Repair/Refurbish and Investment Recovery. The key pain point here was, apart from a highly fragmented spend and high number of suppliers, the reverse supply chain was dogged with an extremely slow inventory movement, low visibility of the flow of PICs and a very low Investment Recovery of 10% (only 10% of the PICs selected for a reverse auction could get sold). Every element of V-U-C-A was playing its part.

In such situation, Infosys has taken lead and after detailed study implemented few recommendations in short to medium term. It yielded few key transformative changes in the value chain, including reduction in number of suppliers (around 25%), increase in visibility (around 50%) and number of inventory turns and also a tremendous enhancement of the Investment Recovery (at least doubled).

So, what Infosys has done right? Infosys has implemented a common communication platform for all players in the value chain to increase visibility throughout the chain. This concept is none other than CPFR (Collaborative Planning Forecasting and Replenishment) in Supply Chain Space to manage VUCA related risks.

Being at the forefront of the supply chain, sourcing and procurement professionals play a key part in managing VUCA related Supply Chain risks, be it developing SLAs for managing reliability, responsiveness and agility based metrics for supplier contracts, or delivering value by bringing about greater opportunities for collaboration and communication across the supply chain entities.

4. P&G's strategy to tackle VUCA challenge: The consumer product giant "Procter & Gamble" has revised and restructured its supply chain to respond the VUCA situations in the world. P&G has taken following 3 major initiatives in this regime.

- In order to meet the needs of the 4 billion plus consumers who buy P&G's products, company had set up plants across the strategic locations in entire world. Further, P&G has switched its strategy from building up factory for single product to multiple products to have better control on supply chains by aggregating demands and reducing inbound and outbound freight costs.
- P&G has started consolidating its production planning function to develop more in-depth subject mastery among its planners. P&G is also working on the adoption of a single, global set of standards for measuring performance across its entire supply chain organization. It helps to drive a common culture across the chain.
- In addition to worldwide supply chain initiatives, P&G is implementing innovations in regional distribution operations. Company is exploring options for both rail and road network in Europe and other continents based on requirement.

5. At Danone Nutricia – Empowering people to deal with VUCA : People are the vital assets at Danone. Supply chain teams are performing on frontlines and the crucial connectors between business strategy and objectives, and the outside world. Empowering supply chain professionals to flex against the upcoming changes on the business horizons by changing business models on timely manner.

Supply chain function is driving all the business' key decision-making processes, with a direct line of communication to senior business leaders. This gives transparency, insight and access to truly understand business' objectives and enables the organization to be more agile whenever we sense that the company's direction of travel is off-target.

Conclusion : VUCA is a new norm in business and organizations have to make strategies to equip supply chain team to tackle such issues. VUCA is applicable whether your business is big or small, global or local. The pace at which external factors are changing ways of working is not going to slow down. While our processes and methods have to adapt in line with the context we're operating in, it's the people within your supply chain function who will make sure any changes are both business and mission-fit. Engaging your people and knowing how to empower them with the knowledge and tools needed to play their role effectively should be a top focus.

Tring.. Tring... It's a wakeup call for Supply Chain professionals.

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[6] Terri Hiskey, "How to Improve Your Supply Chain Strategy in an Age of Uncertainty," Supply & Demand Chain Executive, 17 December 2018.

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About Author

Siddharth Gupta MBA – Batch 2018-20 Institute – SIBM Pune

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WTO UPDATE :

MEMBERS DISCUSS CHALLENGES AND OPPORTUNITIES OF ONLINE SERVICES TRADE AMID COVID-19 CRISIS

At a meeting of the Council for Trade in Services on 1 July, WTO members discussed their efforts to increase the digital capabilities of businesses and consumers in view of the growing importance of online services, especially during the COVID-19 crisis. They also raised specific trade concerns related to transparency, 5G communications networks, pre-installed software, satellite operators and cybersecurity.

The international trading system has become increasingly services-oriented, with online services becoming particularly important during the COVID-19 pandemic. In response to this trend, a dozen WTO members proposed a discussion, in the context of the Work Programme on Electronic Commerce, on how governments are helping businesses and consumers increase digital capabilities while seeking to address the digital divide. All members welcomed the proposal as a positive contribution to the e-commerce work programme.

The proponents suggested a discussion of the challenges and opportunities for digital services delivery and governments' activities aimed at achieving better digital inclusion. This includes providing assistance to micro, small and medium-sized enterprises (MSMEs) and developing countries so that they may increase their share of services exports.

Many developed countries presented their ongoing programmes for increasing digital capabilities in developing countries. Some developing countries underlined that improving connectivity, mastering digital tools, and enhancing international cooperation are essential to make the transition from being buyers to suppliers in international services trade.

Several developing countries highlighted the key role of e-commerce in supporting economic growth and development and in helping MSMEs, in particular, remain active during the crisis. They also mentioned several challenges, including infrastructural constraints and the need to have access to data. They pointed to the importance of government policies that help ensure the gains from online services trade are distributed more equitably across countries.

Members also discussed the COVID-19 pandemic and its implications for trade in services. Many delegations highlighted the importance of sharing experiences, including on trade-facilitating measures adopted to deal with the crisis and to promote economic recovery.

Several WTO members referred to a recent report issued by the WTO Secretariat, which highlighted a greater reliance on online services in sectors such as retail, health, education, telecommunications and audio-visual in the wake of the crisis. This is due to consumers developing new ways of coping with social distancing measures and to suppliers accelerating efforts to expand their online operations.

Many members noted that the crisis has underscored the urgent need to address disparities in digital connectivity. In reference to the moratorium on imposing customs duties on electronic transmissions, which members renewed in December 2019, the African Group said that the pandemic had further highlighted the importance of collecting tariff revenue on such transmissions.

Many members said that creating conditions conducive to trade in services, including open trade policies, will be key to bringing about a sustained and socially inclusive recovery from the COVID-19 crisis. They also stressed the need to avoid restrictions in areas such as cross-border data flows that could undermine economic recovery and the importance of services-related measures being put in place in a transparent manner.

New trade concerns

Australia's 5G-related measures

China raised concerns over Australia's measures on 5G telecom projects, arguing that these prohibit Chinese companies from participating due to unreasonable, non-transparent and discriminatory requirements. These measures violate the non-discrimination principle (also known as the "most-favoured nation principle") and the transparency obligations in the General Agreement on Trade in Services (GATS) and Australia's GATS commitments, China said. It argued that they also undermined the business operations of Chinese services suppliers in Australia. China called on Australia to treat Chinese companies in an objective, just and fair manner.

Australia said that its 5G network requirements are fully consistent with WTO rules and that foreign companies are welcome in the country. Australia said it is the first time that it has heard concerns about this matter in the Council and reiterated its availability to engage with members in a constructive manner.

Russia's fixed satellite operators measure

The United States sought clarifications about a Russian measure concerning the allocation of radio frequency bands for foreign satellite operators, arguing that it violates Russia's relevant commitments under the GATS. Canada and the European Union echoed the US concerns.

Russia stated that it was not aware of the measure at issue having created any difficulties for foreign suppliers and emphasised that there have been no instances of Russian operators being prevented from using the services of foreign satellite operators.

Russia's software pre-installation measure

The United States raised a concern about a Russian measure on the pre-installation of software, noting that, although the measure had been previously discussed in the Council for Trade in Goods and the Technical Barriers to Trade Committee, it also had implications for services trade. The US claims that the measure violates Russia's GATS commitments in several services sectors, including computer and related services, telecommunications and audio-visual services. Canada, the European Union and Japan echoed the US concern.

Russia noted that the legislative process has taken into account the views of foreign service suppliers and stated that the measure at issue did not prohibit the pre-installation of foreign software, did not contain any discriminatory provisions and was consistent with Russia's GATS commitments.

Other trade concerns

China's cybersecurity measures

Japan and the United States reiterated concerns over China's proposed implementation of its Cybersecurity Law, including on matters related to data localization and security assessments on cross-border transfer of data. Japan said it is closely following how China is taking its comments into consideration, including the need for a level playing field in China for foreign and domestic operators. The United States shared Japan's concerns and asked China to update the Council on the status of the draft decree. These concerns were echoed by Canada, the European Union and Chinese Taipei.

China said that the purpose of its cybersecurity measures was to guarantee the security of critical information infrastructure and its supply chain and to safeguard its national security. China said it followed a transparent legislative approach by seeking comments from various stakeholders and taking them into consideration and would continue to do so in the future. It reiterated its willingness to engage on this matter and recalled that Japan and the United States also have laws on cybersecurity. It recalled its concerns regarding the relevant US Executive Order issued in May 2019 and called on the US to bring its measure in line with its commitments and obligations under the GATS.

Viet Nam's cybersecurity measures

Japan and the United States reiterated concerns about Viet Nam's draft cybersecurity measures, including on issues such as data localization, which they claim are negatively disrupting business for foreign operators. Canada, the European Union and Chinese Taipei echoed these concerns.

Viet Nam reiterated that it has followed a transparent process and kept an open mind by consulting with all relevant stakeholders.

Sorce: WTO Webste

RECENT CHANGES IN GOVT. PROCUREMENT POLICIES ON GOVERNMENT E MARKETPLACE

DR. M K BHARDWAJ
iimm2delhi@gmail.com

Buyers to pay 1% interest for late payment on GeM portal : For procurements made under government rules on GeM, buyers are mandated to make payments within 10 days after generation of Consignee Receipt and Acceptance Certificate (CRAC).

In order to promote timely clearance of dues to vendors especially Micro, Small and Medium Enterprises (MSMEs), the government has decided to levy interest on late payment to vendors on the government e-marketplace (GeM). The will be applicable for all procurements made from October 1, 2020.

Clearance of dues is significant for MSMEs as it improves their liquidity and cash flow immediately.

"It is decided that whenever a CRAC is auto-generated or issued by a buyer and payment is not made 10 days hereafter, the buyer organisation will have to pay penal interest at 1% per month for the delayed payment," the Finance Ministry said in an office order.

The ministry said this has been done to promote greater discipline and timeliness in payment to vendors, especially MSMEs. Products sold on the GeM portal range from stationery used by government officials to medical products that are used on patients.

This interest will not be paid to vendor and will be kept by GeM in a separate account which will be used only for education of sellers/buyers etc, or other purposes related to GeM or public procurement with the prior approval of Department of Expenditure," it said.

"This shall not cover any other interest payable to vendors under any law or contractual obligations, which will be over and above the interest charged as above."

Country of Origin made mandatory for Suppliers to enter in GeM Portal : Government e-Marketplace (GeM), a Special Purpose Vehicle under the Ministry of Commerce and Industry, has made it mandatory for sellers to enter the Country of Origin while registering all new products on GeM. Further, sellers, who had already uploaded their products before the introduction of this new feature on GeM, are being reminded regularly to update the Country of Origin, with a warning that their products shall be removed from GeM if they fail to update the same. GeM has taken this significant step to promote 'Make in India' and 'Aatmanirbhar Bharat'.

GeM has also enabled a provision for indication of the percentage of local content in products. With this new feature, now, the Country of Origin as well as the local content percentage is visible in the marketplace for all items. More importantly, the 'Make in India' filter has now been enabled on the portal. Buyers can choose to buy only those products that meet the minimum 50% local content criteria. In case of Bids, Buyers can now reserve any bid for Class I Local suppliers (Local Content > 50%). For those Bids below INR 200 crore, only Class I and Class II Local Suppliers (Local content > 50% and > 20% respectively) are eligible to bid, with Class I supplier getting purchase preference.

Since its inception, GeM is continuously working towards promotion of 'Make in India' initiative. The Marketplace has facilitated entry of small local sellers in Public Procurement, while implementing 'Make in India' and MSE Purchase Preference Policies of the Government in the true sense. GeM is enabling quick, efficient, transparent and cost-effective procurement, especially in this hour of need when government organizations require products and services urgently to fight against the Covid-19 pandemic. The purchases through GeM by Government users have been authorised and made mandatory by Ministry of Finance by adding a new Rule No. 149 in the General Financial Rules, 2017.

Source: Business India and Press Information Bureau

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STRATEGIC SUPPLY CHAIN MANAGEMENT: A STRATEGIC APPROACH FOR ENHANCING BUSINESS PERFORMANCE

DR. PANKAJ M. MADHANI, ASSOCIATE DEAN AND PROFESSOR
ICFAI BUSINESS SCHOOL (IBS), AHMEDABAD, pmadhani@iit.edu

Introduction : There are various drivers influencing performanceof the firms. One of them, strategic supply chain approach, is about strategic thinking on supply chain management (SCM) to enhance the firm's performance.SCM is "the management of upstream and downstream relationships with suppliers and customers in order to create enhanced value in the final marketplace at low cost to the supply chain as a whole" (Christopher, 2011).SCM is a critical success factor for today's organizations.

Firms can experience improved performance through SCM by aligning various processes from customer and its upstream, and sharing relevant data for enhancing customer value proposition. SCM operates at three levels:strategic, tactical and operational (Cooperet al., 1997). The highest level of SCM decisions isthe strategic -also referred as strategic supply chain management (SSCM) which is relevant to the entire organization.

Any action plan to enhance supply chain (SC) performance makes efforts to align supply and demand, reduce overall costs and enhancecustomer satisfaction (Madhani, 2018).Bruceet al., (2004) defined a supply chain as "a process that describes the flow of goods from the production of a product right through to the final sale to the end consumer". According to Poluha (2006): "A supply chain is a coordinated system oforganizations, people, activities,information and resources involved inmoving a product or service in physical orvirtual manner from supplier tocustomer".

Conventionally, the focus of supply chainhas been on moving materials in the whole delivery process and hence it has been labeled as 'support' function in the value chain as support functions help firms in achieving their goals. The traditional supply chains have aimed to become leaner with shorter lead times and more cost efficient to lower costs (Christopher, 2005). However, with focus of only cost efficiency they are more vulnerable to unexpected events and as a result, they faced major problems such as stock outs and disruption of activities (Lee, 2004). In this context, strategic supply chains take a crucial role in enhancing efficiency and effectiveness of operations.Strategic supply chainsare capable of building competitive advantage by balancinghigher efficiencyrequirements along with better demand management while managing supply chain risks.

Strategic Supply Chain Management (SSCM): Key Dimensions : The main theme of SSCM is not limited to theuse of a supply chain as a process to delivergoods and materials to right place, asits scope is extended to elevate strategic position of a firm by strengthening its overall business performance.In this way, strategicsupply chainapproachtransforms traditional supply chain from a functional role that guides operational strategy as a supporting function to a central theme of the business strategy.SSCM can enable firms to create value in multiple ways and shows how the role of supply chain is being redefined, from an operational tool to a bonafide competitive strategic weapon.

The value of SSCM is reflected in how firms such as Wal-Mart, Zara, Toyota, and Dell have used their supply chains as competitive weapons to gain advantages over peers (Hultet al.,2007). These firms have created competitive advantage by balancing downward cost pressures and the need for efficiency, with effective means to manage the demands of market-driven service requirements and the known risks of routine supply chain failures.

In order to be competitive, firms have to design and manage a supply chain that is agile, adaptive, assured and aligned, i.e. develop the strategic supply chain.The most successful companies work within strategic supply chains that rapidlyrespond to short-term changes in immediate and ultimate customer' demands (i.e. agility),adjust to long-term changes in economies and markets by restructuring the supply chain(i.e. adaptability), offer robustness and reliability of supply chain network (i.e. assurance) and integrating and coordinating business processes resulting in anequitable sharing of risks, costs, and benefits with all participating partners (i.e. alignment).

The focus of SSCM is to identify thecritical combination of competitive priorities (quick response, higher flexibility, higher reliabilityandlow cost) in supply chains that can help organizations to succeed.Strategic supply chains do not aim to improve only one operational dimensionof supply chain but aim to maximize the total value added to the customer and to use supply chain as a means to create a competitive advantage and enhance firm performance. Therefore, strategic supply chains excel in their performance in relation to a set of competitive priorities and at the same time, they

achieve sustainable competitive advantage (Figure 1).

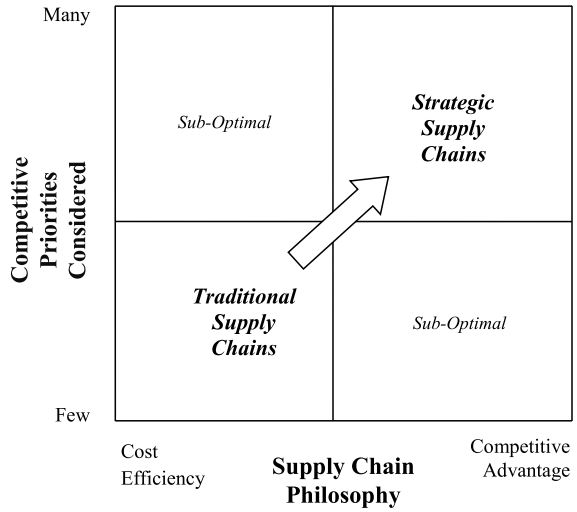

Figure1: Traditional Supply Chains versus Strategic Supply Chains: Performance Criteria

(Source: Framework Developed by Author)

Strategicsupply chains with its agility and capability of speed can respond both quickly and cost effectively in the rapid demand and supply fluctuations.Such supply chains are resilient as they are able to modifysupply chain design to accommodate and adaptmarket changes.Strategic supply chains have assurance of system that performs its function as intended and hence provide reliability. They are also characterizedby the alignment of interests of all chain members and accordingly make collective efforts to pass any cost efficiencies totheirbuyer.Strategic supply chains do not fixate on flexibility, or on any other single metric; instead, relative to their peers, strategic supply chains focus on the total value added to the customer. Strategic supply chains target high performance across all competitive priorities and hence provide superior outcomes in terms of overall customer satisfaction. Overall, a strategic supply chain aims for an ideal balance among these four competitive priorities.

SSCM canimprove the product planning process as well as distribution strategy and overall supply chain decision making related to it. Thus, SSCM booststhe organization's ability to introduce new products and enhancements of existing products in an effective and efficient manner. As customer data and information is shared in real-time with the supply chain partners, quality improvements and product innovation process accelerates while trimming down time to market. Such strategic approach for enhancing customers' overall satisfaction with firms' products or services, improves the profitability and efficiency of the entire enterprise in the long run,which includes all the supply chain partners. SSCMis increasingly being recognized by organizations as a strategic choice for enhancing performance of organizations by decreasing inventories across various partners of supply chain and simultaneously deliver what the customer demands.

Strategic Supply Chain Management (SSCM): Convergence of Competitive Priorities

Strategic supply chains attempt to build on agility, adaptability, assurance and alignment in order to do really well along multiple outcomes - often labeled as "competitive priorities" and hence provides better solution to cater changing customer needs.

The diverse goals of a strategic supply chains are:

(1) to enhanceresponsiveness to demand fulfillment process by delivering the materials in correct sequence and shape i.e. at desired place and time by gathering and analyzing sales data. Supply chain responsiveness enables supply chain to initiate quick response on short-term, temporary or interimchanges in supply/demand;

(2) to enhance resiliency of supply chain to cater volatile demand changes by modifying supply chain design to accommodate market dynamics. Resilient supply chain quickly senses market changes to meet customers demand, with stands system icdiscontinuities and adapts to a new riskenvironment;

(3) to increase reliabilityby controlling probable causes of supply chainrisks, design constraints and interruptions as a reliable supply chain performs its function as intended overcoming supply chain disruptions;and finally

(4) to enhance realignment among supply chain partners by establishing incentives for them to improve performance of the entire chain as a realigned supply chain operates in an uninterrupted and seamless fashion.

Figure2, shows, a conceptual framework of strategic supply chain management (SSCM) with all these competitive priorities of responsiveness, resiliency, reliability and realignment.

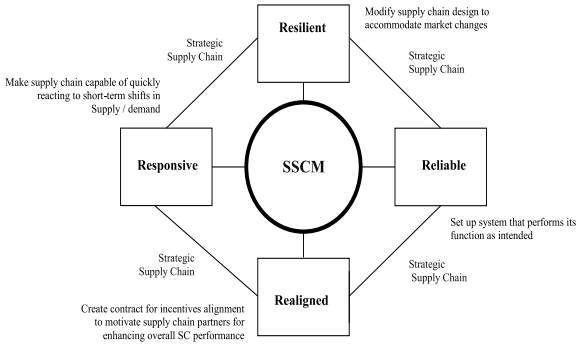

Figure 2: Strategic Supply Chain Management (SSCM): Convergence of Competitive Priorities

(Source: FrameworkDeveloped by Author)

Strategic Supply Chain Management (SSCM): Competitive Priorities

Competitive priorities of strategic supply chain management shown in Figure 2 are explained below:

(1) Responsiveness : Responsiveness describes the ability to react quickly to sudden variations in demand or supply.With responsiveness, firms handleexternal disruptions smoothly by responding to short-term changes in demand or supply swiftly.

(2) Resiliency : Resiliency describes the ability to adapt overtime as market structures and strategies evolve. It allows firms to alter design of supply chain according to changes in products, markets, strategies and technologies.Unless firms make their supply chain adaptable, it's very challenging for them to remain competitive in market place.

(3) Reliability : In supply chain performance management, reliability indicates 'correct' supply chain deliveryperformance in terms of product, place, time, packaging, quantity, and documentation, to the actual customer (LMI, 2003). Reliability represents the odds that any individual component or whole system carries out its assigned task as planned and hence it refers to the degree to which a supply chain yields consistent performance (Kuoand Zuo, 2003).

(4) Realignment : Lack of supplychain alignment can be caused by functional silos andconflicting objectives across various functional areas such as marketing, sales, manufacturingand distribution.Supply chain alignment can be defined as the ability to share information, responsibilities and roles and incentives with supply chain members to synchronize and coordinate processes and activities. Realignment of supply chain refers to aligning the interests of supply chain partners continually by confirming that the goals of a supply chain partners are in harmony.

Conclusion : Strategic supply chain management (SSCM) has a direct impact on performance of a firm, as it enhances capabilities of the firm to excel in theswiftly changing business environment, with evenmore focus on the customer. In order to be competitive, firms have to design and manage a supply chain that is agile, adaptive, assured and aligned, i.e. develop the strategic supply chain. Accordingly, strategic supply chains transforms traditional supply chain from a functional role to a central theme of the business. Firms that effectively developstrategic supply chain are differentiated from other firms in number of ways: increased responsiveness, resiliency, reliability and better realignment with supply chain partners.

SSCM helps organizations to anticipate demand of consumers precisely; cater such demand reliably and swiftly and enhance supply chain productivity. Hence, it ultimately leads to decrease in supply chain costs, faster market response and higher efficiency and effectiveness of supply chain.Greater insight into demand and delivery schedule will improve operational efficiencies and help organizations in creating the business value theyseek. SSCM creates competitive advantage for firms by balancing downward cost pressures and the need for efficiency, with effective means to manage the demands of market-driven service requirements and the known risks of routine supply chain failures. This research has emphasized that dynamic capabilities of responsiveness; resiliency; reliability and realignment are important drivers of strategic supply chain management.

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"TRANSFORMING FUTURISTIC TECHNOLOGY ENABLED SUPPLY CHAIN 4.0– THE NEXT INDUSTRIAL REVOLUTION"!

RABI NARAYAN PADHI
FELLOW IN RESEARCH MATERIALS MANAGEMENT,
NATIONAL COUNCILOR [NC] , LIFE MEMBER IIMM VIZAG Br,
rabin.padhi@gmail.com

Abstract : The Next Generation Digital Supply Chain in **–Re-Energise Future of India, digital technologies** like **social media, mobile, and analytics** are advancing rapidly on the economic landscape. These innovations are used widely by consumers and employees alike. **Facebook** has more than 1 billion users.There are more than 6 billion **mobile phones**.Employees often have better digital solutions at home than they do at work, and many customers are more **technology savvy** than the people trying to sell to them.

India is at the cusp of a **digital chain supply revolution**. Declining broadband subscription prices, aided by the launch of **4G** services, have been driving this trend. This has led to an ever-increasing number of "**netizens**." Furthermore, the likely launch of **5G** services is expected to significantly augment the country's **internet user base.**

Internet has become an integral part of this growing Indian **population segment** for remaining connected with **friends, accessing emails, buying movie tickets and ordering food**. The **changing lifestyles** of the country's **urban population** have also led many people relying on the **internet for their shopping needs**. The convenience of shopping from the comfort of one's home and having a wide product assortment to choose from has brought about increased reliance on the online medium.

Disruptive **innovations** are currently changing the landscape of many industries and their business models. Because of increasingly **digitalized processes** and an exponential growth of sensible data, supply chains are also impacted by the **fourth industrial revolution**.

The trend of **online shopping** is set to see greater heights in coming years, not just because of India's rising **internet population**, but also due to changes in the supporting **ecosystem**. Players have made intensive efforts to upgrade areas such as logistics and the payment infrastructure. Furthermore, the Indian consumer's perception of online shopping has undergone a drastic change, and only for the good. Given these developments, venture capital investors, who were restricting themselves to the sidelines, are now taking a keen interest in the country's **e-Commerce** market.

In today's ferociously competitive global business environment, corporate are under compulsions to find **new and unique ways** to create and deliver value to customers through **innovations** and the demand to innovate and **– Efficient, First and Tailored**deliver better value addition is growing ever stronger and stronger .

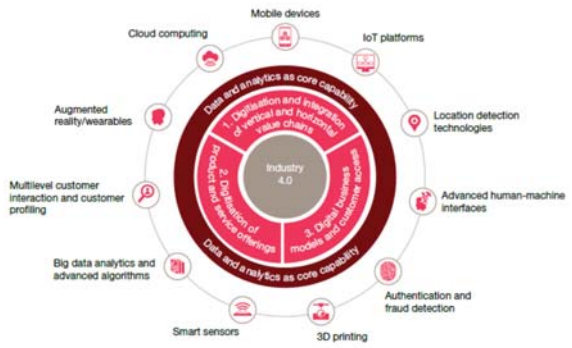
Innovate to be strongly differentiated and transform supply chain to make it a driver for sustainable growth.

The present paper provides a brief overview of **opportunities and challenges** encountered by the emerging Innovative Technology Enabled Supply Chain Practicein India's economy. It is heartening to note that India is called the '**services hub'** of the world.

Key Words:(Innovation, Sustainable, Economy, Technologies, Value Chain, Processes)

I.Introduction: Technology in Supply Chain : Around the world, traditional manufacturing industry is in the throes of a digital transformation that is accelerated by exponentially growing technologies (e.g**. Artificial intelligent (AI), Augmented Reality(AR), autonomous drones, Block chain, sensors, 3D printing, Internet of Things (IoT) Internet of Everything (IoE) Vertical Reality (VR), Robots,**

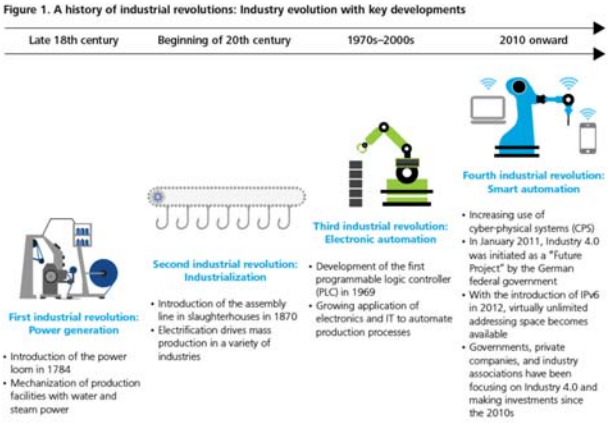
Industry 4.0 framework and contributing digital technologies



companies, a profound **digital transformation** is now underway. Industrial leaders are digitising essential functions and processes. They are enhancing their product portfolio with digital functionalities and are investing in data analytics as a foundational capability to drive innovation and significant improvements in efficiency. In India as well, we see industrial companies planning to dramatically increase their overall level of digitisation.

The term '**Industry 4.0'** stands for the **fourth industrial revolution**. Other related terms include **'industrial Internet'** or **'digital factory'**, although neither takes as complete a view. While **Industry 3.0**focussed on the automation of single machines and processes, Industry 4.0 concentrates on the end-to-end **digitisation**of all physical assets and their integration into digital ecosystems with value chain partners. Generating, analysing and communicating data seamlessly underpins the gains promised by Industry 4.0, which networks a wide range of new technologies to create value.

Figure 1. A history of industrial revolutions: Industry evolution with key developments



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Graphic: Deloitte University Press | DUPress.com

I. What is Industry 4.0?

"The question arises with industry 4.0 of whether it is an evolution or a revolution."

The concept of industry 4.0 is widely used across Europe, particularly in Germany's manufacturing sector. In the United States and the English-speaking world more generally, some commentators also use the terms the 'internet of things', the 'internet of everything' or the **'industrial internet'.**

behind the scenes of the world's leading industrial

The concept of industry 4.0 is widely used across Europe, particularly in Germany's manufacturing sector. In the United States and the English-speaking world more generally, some commentators also use the terms the 'internet of things', the 'internet of everything' or the 'industrial internet'.

What all these terms and concepts have in common is the recognition that traditional manufacturing and production methods are in the throes of a digital transformation. For some time now, industrial processes have increasingly embraced modern information technology (IT), but the most recent trends go beyond simply the automation of production that has, since the early 1970s, been driven by developments in electronics and IT (see Chart 1).

II. Industry 4.0 is the current trend of **automation** and data exchange in manufacturing technologies. It includes **cyber-physical systems,** the **Internet of things** and **cloud computing.**Industry 4.0 creates what has been called a "smart factory". Within the modular structured smart factories, cyber-physical systems monitor physical processes, create a virtual copy of the physical world and make decentralized decisions. Over the Internet of Things, cyber-physical systems communicate and cooperate with each other and with humans in real time, and via the Internet of Services, both internal and cross-organizational services are offered and used by participants of the **value chain**

While terms like industrial **Internet and digital factory** are also used to describe these changes, Here, we use **Industry 4.0** to describe the journey industrial companies are taking towards a complete value chain transformation. At the end of this transformation process, successful industrial companies will become true digital enterprises, with physical products at the core, augmented by digital interfaces and data-based, innovative services. These digital enterprises will work together with customers and suppliers in industrial digital ecosystems. These developments will fundamentally change individual companies as well as transform market dynamics across a whole range of industries. And that is true in countries all around the world—in both developed and emerging markets.

Connected manufacturing as Industry 4.0, several other commonly known terms may point to the same phenomenon. These include:

- Industrial Internet
- Connected Enterprise
- SMART Manufacturing
- Smart Factory
- Manufacturing 4.0
- Internet of Everything
- Internet of Things for Manufacturing

The term "Industrie 4.0" originates from a project in the high-tech strategy of the **German government,** which promotes the **computerization** of manufacturing.

Design principles

There are 4 design principles in Industry 4.0. These principles support companies in identifying and implementing Industry 4.0 scenarios.[1]

Table 2. Industry 4.0 key business objectives, organized

BUSINESS OPERATIONS	Productivity improvements	• Maximizing asset utilization and minimizing downtime • Driving direct and indirect labor efficiency • Managing supply network costs and synchronization • Ensuring schedule and plan stability and accuracy
	Risk reduction	• Ensuring raw material price and availability • Managing warranty and recalls effectively • Mitigating geographic risks
BUSINESS GROWTH	Incremental revenue	• Finding sources of growth for the core business • Growing aftermarket revenue streams • Deepening customer understanding and insights • Strengthening customer integration and channels
	New revenue	• Creating new products and service offerings • Expanding internationally and in emerging markets • Indentifying attractive M&A opportunities

1. **Interoperability:** The ability of machines, devices, sensors, and people to connect and communicate with each other via the Internet of Things (IoT) or the Internet of People (IoP).
2. **Information transparency:** The ability of information systems to create a virtual copy of the physical world by enriching digital plant models with sensor data. This requires the aggregation of raw sensor data to higher-value context information.
3. **Technical assistance:** First, the ability of assistance systems to support humans by aggregating and visualizing information comprehensibly for making informed decisions and solving urgent problems on short notice. Second, the ability of cyber physical systems to physically support humans by conducting a range of tasks that are unpleasant,

too exhausting, or unsafe for their human co-workers.

4. **Decentralized decisions:** The ability of cyber physical systems to make decisions on their own and to perform their tasks as autonomously as possible. Only in the case of exceptions, interferences, or conflicting goals, are tasks delegated to a higher level.

III. Challenges

Challenges which have been identified include

1. IT security issues, which are greatly aggravated by the inherent need to open up those previously closed production shops
2. Reliability and stability needed for critical machine-to-machine communication (M2M), including very short and stable latency times
3. Need to maintain the integrity of production processes
4. Need to avoid any IT snags, as those would cause expensive production outages
5. Need to protect industrial knowhow (contained also in the control files for the industrial automation gear)
6. Lack of adequate skill-sets to expedite the march towards fourth industrial revolution
7. Threat of redundancy of the corporate IT department
8. General reluctance to change by stakeholders
9. loss of many jobs to automatic processes and IT-controlled processes, especially for lower educated parts of society

IV. Impact of Industry 4.0

Proponents of the term claim Industrie 4.0 will affect many areas, most notably:

1. **Services and business models**
2. **Reliability and continuous productivity**
3. **IT security**
4. **Machine safety**
5. **Product lifecycles**
6. **Industry value chain**
7. **Workers' education and skills**
8. **Socio-economic factors**
9. Industry Demonstration: To help industry understand the impact of Industry 4.0, Cincinnati Mayor John Cranley, signed a proclamation to state "Cincinnati to be Industry 4.0 Demonstration City".
10. A article published in February 2016 suggests that Industry 4.0 may have a beneficial effects for emerging economies such as India.

V. Addressing today's challenges

1. **Go beyond just data, generate insights –** Use data analytics to understand customers,market trends, track usage patterns, predict failures etc.
2. **Improve, standardize, and automate:** processes to reduce internal cost to serve
3. **Contract effectively** to get best value and manage risk in the changing digital landscape
4. **Embrace technology to support business** e.g. application of sensors, drones, machine learning, 3D printing etc.
5. **Develop right skills internally and explore partnerships** to meet new digital needs

VI. What can you do to prepare for the future?

Behind the great potential of the **digital supply chain (DSC) lies Industry 4.0,** the fourth industrial revolution. A transformation in production and automation was brought on first by steam and water power (Industry 1.0), then by electrification (2.0), and more recently by the digital computer (3.0). Industry 4.0, digitization, is about companies orienting themselves to the customer through e-commerce, digital marketing, social media, and the customer experience.

Digital ubiquity is also causing companies to completely rethink how they go about operations. Operations is often mistakenly viewedas "manufacturing," but operations is what gives a company its ability to act. As with every other aspect of a company, digital technology is enabling completely new operating models.

VII. Conclusion : In this work on Industry 4.0 two methodological approaches have been used to explore the impact on the procurement function. A scoping study was used to better understand Industry 4.0 while in-depth explorative interviews with seven procurement managers should reveal insights from practice.

Of course this study is limited with regards to the number of participants in the explorative survey. However, the conceptual findings and empirical insights support the conceptual differentiation of "Procurement 4.0" from previous maturity levels of technology use in procurement. The observations have been collected in form of six fundamental observations. Obviously, Procurement 4.0 must support superior Industry 4.0 strategies of the company. In this role it shall assure the dynamic cooperation across organizations borders and the achievement of a collaboration productivity rent, while safeguarding the companies risk exposure within the Industry 4.0 supply chain. However, research on the topic is still in its infancy, while practice signaled a high demand for explanative knowledge. More conceptual and empirical work is needed to better understand the effects of Industry 4.0 on procurement in detail.

With these considerations in mind, this work is an initial exploration of the phenomenon and further observations need to be taken.

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TRANSFORMATION OF SUPPLY CHAINS THROUGH DIGITIZATION

DR.C.SENGOTTUVELU, CPM (ISM-USA)
PROFESSOR, DEPT. OF PG MANAGEMENT STUDIES
ACHARYA BANGALORE B-SCHOOL, BENGALURU
sengottuvelu138@gmail.com

Abstract : This paper analyses the various facets of digital supply chain transformations and its benefits as reported in the McKinsey's report on digital supply chains and also PwC reportson Industry 4.0 - how digitization makes the supply chain efficient, agile and customer-focused.

Digital transformation ways and its impact on supply chain and creating or defining market place were discussed. The McKinsey digital supply chain compass maps supply chain 4.0 improvement levers and main value drivers were highlighted. Future digital supply chain transformations and its benefits were also discussed.

Keywords: digital disruptions, electronic innovations, digital transformations, supply chain 4.0,

Introduction : The companies that are truly aiming in recent times have something significantly in common: a digitized supply chain. 89% of companies with digital supply chains receive perfect orders from international customers, and entering on time delivery / error free delivery.

Companies have saved labour time for its logistics team after digitizing its vendor booking process. Digitization brings about future supply chains (supply chain 4.0), which will be faster, more flexible, more granular, more accurate, more efficient and agile in nature (McKinsey, 2019).

Supply chain professionals expect digitization to bring significant economic benefits to both top and bottom lines. Companies with highly digitized supply chains and operations can expect efficiency gains of 4.2% annually, while increasing revenue by 2.9% a year. Companies across industries are already investing heavily to develop their own versions of the digital supply chains. According to a recent PwC study on the rise of Industry 4.0, a third of the more than 2000 respondents say their companies have started to digitize their supply chains and fully 72% expect to have done so five years from now. Lot of supply disruptions are going to take place in the coming years.

Redefining the supply chain : There are five main ways in which electronic innovation / digital transformations impacting the supply chain and creating or redefining market place.

Main ways	Details
Dematerialization	Reduction, removal, and redeployment of substantial assets invested in traditional sales and marketing.
Disintermediation	Compression in the length of the supply chain through the elimination of middle men in the sales process.
Deverticalization	Creation of extended enterprises, linked manufacturers and inter-linked groups operating within new electronic markets.
Data integration	Real time access, capture and transfer of data between trading partners.
Development of products	Which support, sustain and new extend electronic commerce

Source: Jon Hughes, Mark Ralf & Bill Michels, 2002.

Digital supply chains : Digital supply chain means that it is an integrated planning and execution, logistics visibility, procurement 4.0, smart warehousing, efficient spare parts management, autonomous and B2C logistics and prescriptive supply chain analytics.

The McKinsey Digital Supply Chain Compass maps Supply Chain 4.0 improvement levers to 6 main value drivers

SOURCE: McKinsey

Figure 1 The McKinsey digital supply chain compass

supply chain 4.0 improvement levers to 6 main value drivers.

Digital transformation includes digital development and digital disruptions. Digital supply chains are working on 'pull based inventory' principle. Digital transformation improves speed, flexibility, operational efficiency and customer experience (Sengottuvelu, 2019).

Digitization brings about future supply chains (supply chain 4.0), which will be faster, more flexible, more granular, more accurate, more efficient and agile in nature (McKinsey, 2019).

According to McKinsey study, planning, physical flow, performance management, order management, collaboration and supply chain strategy are 6 main value drivers in the supply chains.

Today's supply chains are a series of discrete steps involved, product development, sourcing & procurement, manufacturing, marketing, distribution, logistics and customer care. Digitization will change that, bringing down walls and creating a completely integrated ecosystem that is fully transparent to all the entities involved. The ecosystem will depend on several key digital technologies including 3D printing, robots, analytics & other logistical platforms (Stefan Schruf, 2017).

Future digital supply chain transformations

According to Jag Srai (2017), the future digital supply chain transformations (DSCTs) are going to take place in the following areas:

Digital supply chain transformations	Salient features and benefits
i. Automated e-Sourcing	Digitization can give enhanced visibility through seamlessly connected, automated replenishment in line with real-time KPI monitoring and predictive disruptive analytics.
ii. Digital factory design	3D, FMS, & EDI will deliver a new paradigm for factory layout design, process and material flow. Organization will need to analyse if, it is cost effective and whether it will create and capture the most value.
iii. Real-time factory scheduling	Sensor- enabled smart devices, real-time data KPI monitoring & predictive maintenance could lead to increased productivity and improved delivery service.
iv. Flexible factory automation	While automation can deliver cost for variety, increased customization, labour saving, quality assurance, closer to market and improved health and safety it also needs to support necessary economics and enable flexible configuration.
v. Digital production process	Additive manufacturing, & continuous processing with advanced process analytics will enable new product designs and enhanced customization, it can also disrupt entire supply chains.
vi. E-Commerce fulfilment	Web-based order management and inventory management to multiple POS, covering last-mile delivery and direct delivery, constant monitoring of usage and experience and tailoring to suit to the requirements.
vii. Extended supply chain (near) real-time monitoring	This could help companies to optimize integration, predict disruptions and support dynamic decision-making.
viii. Digital product quality	Companies can create powerful digital product quality management systems by connecting back from customers to suppliers. This could result in problem prevention and faster resolution, better performance, compliance verification and avoided warranties.
ix. Digital supply chain design	Digital network design modelling and visualization tools can be used to redesign the total supply network configuration.
x. Product life cycle management (PLM)	Next-gen PLM systems will provide accurate, up to-date product information accessible throughout the value chain and product life cycle.

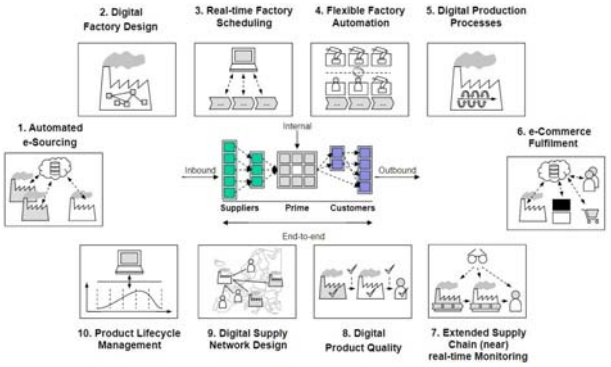

Figure 2 Future digital supply chain transformations

Figure 2 shows the future digital supply chain transformations and its salient features with benefits. For examples, when companies are having issues related to scheduling, then DSCT- 3, will take care of such issues. Similarly, quality related issues are addressed through DSCT-8, product life cycle management through DSCT-10, so on and so forth.

Conclusion : In recent years companies are more focusing on their supply chain digitization. This is going to continue for next 5-10 years. According to the reports of McKinsey and PwC, Industry 4.0 technologies are going disrupt the supply chains further. IoT, AI, ML 3D, Sensor based –smart devices and automation are going to bring new challenges and opportunities to the corporates. Linear supply models operating in silos are going to adopt integrated supply chains. Supply chain strategies are going to focus on lean and agile philosophies in business. Supply chain professions in general are going to focus more value added links in their supply and eliminate non-value added activities / functions. In other words, how value is added in their supply chains to offer to their customers.

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Indian Institute of Materials Management

MISSION

- To promote professional excellence in Materials Management towards National Prosperity through sustainable development.

OBJECTIVE

- To secure a wider recognition of and promote the importance of efficient materials management in commercial and industrial undertakings.
- To safe guard and elevate the professional status of individuals engaged in materials management faculty.
- To constantly impart advanced professional knowledge and thus improve the skill of the person engaged in the materials management function.
- Propagate and promote among the members strict adherence to IIMM code and ethics.

CODE OF ETHICS

- To consider first the total interest of one's organisation in all transactions without impairing the dignity and responsibility of one's office :
- To buy without prejudice, seeking to obtain the maximum ultimate value for each rupee of expenditure.
- To subscribe and work for honesty and truth in buying and selling; to denounce all forms and manifestations of commercial bribery and to eschew anti-social practices.
- To accord a prompt and courteous reception so far as conditions will permit, to all who call up on legitimate business mission.
- To respect one's obligations and those of one's organisation consistent with good business practices.

HOW WE WANT FUTURE OF PROCUREMENT... TO LOOK LIKE.!

MS SUVARNA SUDAGONI, LIFE MEMBER & EC MEMBER
IIMM HYDERABAD BRANCH, ssuvarna08@gmail.com

The future of procurement is an exciting one but currently looks variable due to lack of strategic planning, clarity, leadership and clear direction. There is an urgent need for procurement professionals to look ahead and work towards effective, transparent and strategic procurement.

We should strategically move procurement to a surer footing. We have to understand the organisation's goals and objectives and show, what best is possible for procurement and set the procurement direction to follow. Procurement should be able to assist our organisation, move towards to saying 'yes' and being more supportive that can meet organisational requirements.

First of all, Procurement professionals should make themselves a desirable sect of people in the organisation to be approached! They should build confidence to all others, that they can always add value, speed, efficiency for growth and profitability of the organisation and request to be involved in early stages.

Need for a Strategic Approach: Procurement requires a clear vision and direction that morphs into a specific and measurable procurement strategy. For procurement to have a positive future we have to start planning now, so future procurement professionals can reap the benefits. Relevant procurement for all options is a must. It would be helpful if we looked at not only the future direction of procurement and but the mid to long term strategic plans. What do we want to see in the short, medium and long term?

Going forward, we, Procurement Professionals, can think strategically and undertake procurement that is specific to each procurement requirement. The 'Same Way ' need not be the best way and thinking 'outside the box' is essential. Let us stop following the "Calf beaten track" and think simpler and innovative ways.! We should accept change for better.

Procurement should be Proactive and not Reactive: Proactiveness is the organisation's soul.!

Changing the 'conversation' – we have to look at how we operate – at times we over complicate the process. We are also ignoring our contractual partners – our suppliers. This trend of today's procurement professionals should change and this is possible when we are with positive attitude and proactiveness towards the profession. For example: They should take the lead to monitor, forewarn likely undue delays in supplies if any, instead of reacting to user departments raising the alarm and then rush to take corrective action. Procurement should be always Alert.!

Value Creation : We can consider how we add value through value creation. We certainly need transformation as well as value creation. We really and immediately need to take a hard look at what is needed and that is procurement leaders and leadership. If we want meaningful procurement to show what is possible, we need procurement leaders and leadership to show the way and provide means for this to happen. In this way we can reform procurement and create or increase the value of procurement in the way we move forward.

Co – Creation and Collaboration: We can achieve our requirements if we act in a cohesive, collaborative and innovative way. We have to move from transactional procurement to transformational procurement. We have to operate in an 'us' environment rather than 'them and us' environment that happens all too often. The present state of procurement professionals is in difficult state and many factors influenced them to take a back step and we all will definitely and have to get over from this kind of state of thinking. The 'us' environment will not only provide a competitive edge to the organisation but also, a great place for the procurement professionals in their respective organisations. Working together effectively is in itself powerful. Both sides will benefit for ongoing rewards for both short and long term goals.

Collaboration is essential so that buyers and suppliers work together sustainably and for building relationships. This requires true collaboration rather than as a 'wish' without putting into practice. Let us not forget our suppliers – we have to bring them along with us. We can learn by active listening. They could well be ahead of us and waiting for us to engage.

We as the procurement professionals often take undue advantage of the suppliers' goodness and it happened and still happening. Suppliers are the stakeholders, who

(most of them) support our businesses run smoothly and waiting very patiently for our honesty and return support by way of their payments release on time and involving them in our future supply projects.

Let us harness the power of collaboration – this can pave the way for working innovatively. The most important step to achieve is a plan and effective communication, which leads to positive collaboration. Contract flexibility provides for options and clarity of purpose that can allow us to get 'past the norm' and be creative in how the relationship works. Of course this is best for buyer/supplier relationship, that have been in place for some time and where performance has been positive.

Procurement sustainability – We can no longer ignore this issue. We must consider requirements of our particular industry. This applies to environmental concerns as well as certainty of supply issues.

We expect that the supplier has a responsibility to 'do something' but often we do not look at the part we need to play. Lack of attention by procurement professionals loses the opportunity to look at the 'big picture' and make positive change to procurement and the entire supply chain.

Sustainability strategy – is recognising that sustainable procurement strategy cannot be considered in isolation of the organisation's overall strategic vision and direction. A sound sustainability strategy protects organisation's reputation and all key ingredients for long-term growth and profitability.

The future : We require a clear vision and the ability to implement it. We have to be flexible and our contracts needs to document both the technical requirements but also an effective change mechanism. Procurement has to move from the traditional buyer/supplier relationship which can be a confrontational one and look ahead so both sides work together effectively. Buyers should work "shoulder to shoulder" with their supply partners to resolve issues in Quality, on-time delivery and cost reduction initiatives. We have to recognise that both parties need the other and we should look at how we can improve the relationship and work constructively together in both operations procurement and for next generation procurement.

Linking to procurement reform – Procurement is in need of reform. We should look at implementing change within our organisation. Equally, we can contribute to the wider discussions. There is an urgent need for procurement to change/grow and gain a necessary 'voice'. Procurement should set the agenda, discuss what can be and involve ourselves so procurement can provide effective solutions to our organisations.

As a part of this, of course, is the need for procurement leaders to become visible and their leadership acknowledged and used. Procurement requires procurement leaders and by extension procurement leadership. This will enhance procurement and will also provide opportunity to provide input into the procurement agenda. But… how do we find such leaders and what kind of leadership does procurement require?

Procurement leadership – We need to 'grow', and one way of doing this is to encourage leadership – on both the big stage as well as within our organisations. We need to consider the 'big stage' discussionss and especially as it relates to the 'how' and 'where'. The 'big stage' is where this belongs rather than within individual organisations.

Procurement leaders – Procurement badly requires procurement leaders. A thorough discussion is required about the mechanism of the process of finding and mentoring aspiring procurement staff.

Place in organisation structure – It is well past time that procurement had a 'place' in organisations and appropriate visibility and impact. We need to move out on our own rather than being the 'poor subordinate' and hiding under the umbrella of divisions such as 'Finance' or 'Corporate Services'. This requires a big discussion as to where we see ourselves.

Procurement roles – Procurement is in dire need for consistency of roles. This area is such a mess. It is not helpful to have conflicting roles and terminology. We also badly need for procurement staff to be empowered so that they feel valued which will help with retaining of staff.

Looking at procurement rules – Discussion should occur to establish the viability of rules, especially in respect of how long the procurement process takes. This can putt off suppliers and lead to frustration. It is acknowledged that there needs to be a transparent process – but a balance should be established between transparency and timeframes.

Procurement salaries – This should be looked at, especially compensation for procurement expertise. Realistic salaries need to be paid and to recognise the work and expertise needed to be in the professional category. Let us move away from the solely administration category.

Saying that it can be hard, especially if the procurement roles have not been defined, this does not absolve the company from paying appropriately for their procurement expertise. Role descriptions can be developed and expertise measured – so the two issues should be looked at and resolved.

For Procurement specialised courses and training, there is a Professional Body, i.e., Indian Institute of Materials

Management (IIMM)… always available, running several programmes to support the Procurement / SCM professionals with its various Procurement & SCM courses and Training Programs!

For more details: Please visit www.iimm.org

Before we find the people that we first to have a good picture of roles and training. The role of the procurement professional might seem obvious but we should acknowledge that the role itself needs to be better defined. It is often split, or worse, barely acknowledged as a 'role'. So, procurement needs to find its place. This is quite possible with great patriotic working attitude and skill development through proper professional training courses.

Staff training/mentoring/induction. – Procurement requires well trained staff and staff who has passion to be in procurement. We need to motivate, encourage and 'be there' for staff. Procurement staff can benefit from mentoring.

Ongoing training is a must and updation of knowledge through professional skill development courses, allowing people to attend seminars/ exhibitions, etc relating to the industry, as and when required. Equally, mentoring should be available for those who wish to make use of it or those who have the ability to mentor. This should be a continuous process for a continual progress.

Procurement paradigm versus procurement professional paradigms.

When we think about changing paradigms our focus on both is required, as a focus on one is limiting the extent of how far we can manage and achieve likely results.

The procurement professional paradigm should be about:

1. Thinking strategically.
2. Necessary direction.
3. Need for procurement qualifications.
4. Professional development.
5. This should be backed up by expertise and training.

The procurement paradigm : We cannot continue to operate in the same routine way -we must look at the best way of operating sustainably and innovatively. Equally, it is going to take the whole procurement and supply chain to achieve this.A start needs to be made. New ideas are required for different results. Having a clear direction will allow you to procure strategically.

Skills and competencies : Procurement requires procurement skills as well as complimentary skills such as financial, communication, advocacy, presentation and persuasion skills including management and other 'soft' skills. Some competencies are:

1. Procurement basics
2. Sound Knowledge of the Commodity Procured
3. Communication skills
4. Strategic skills
5. Vision and direction

Competencies seems to focus on procurement requirements at the expense of other helpful skills. There should be a balance of both. A lot of work needs to be put in to build competencies relevant for procurement.

A structured Competency Mapping must be undertaken by a team of experts to assess individuals in procurement, so that square pegs are not fitted into round holes. This mapping will also lead to specific Training needs appropriate to individuals working in the procurement team, instead of generic training without any outcome. Defining clearly proper Job Description is the start of such an exercise.

Retaining procurement staff and empowering procurement leaders – Once we have leaders we need to make sure that we retain them. To do that, we need to encourage personal growth, conceptual understanding, feedback and to provide skill building. We need to up-skill often. We are in dire need of procurement qualifications that reflect procurement overall but also reflect our country's specific laws and procurement rules.

Summary : All the Organisations have competitive challenges and procurement should get ready to manage the challenges as it relates to procurement. It takes courage to effect change. A start is to work within your organisation for procurement change. Procurement cannot do this alone. The organisation also has a big role to play. Courage and empowerment are a useful mix.

Staff should have confidence that they can make a difference and their input is valued. Procurement professional need to 'speak up', to be empowered, to provide relevant and factual information. In this way we can provide value-add to management such as procurement savings. Here, the top management should look into and delegate the required professional authority with the relevant responsibility. The top management has to seriously look into this area and empower the procurement professionals and align the function in line with other functions.

These are challenges but there are also opportunities to improve procurement and to improve the procurement professional role. By doing so, procurement professionals can assist better the organisation overall objectives.

Let us all make an immediate start (if not started, yet..!) so our procurement future is a positive one – for existing procurement professional but also future procurement professionals. Let us make it easier for them and in the process we can make it easier for ourselves as well – it is a win-win situation/ platform – what do you say.!

Ø A request to the readers of this Article: To please forward your views and suggestions to the Author and Editor of MMR, to improve on the future articles.

References: Internet; Self Knowledge & Experience and The Senior Associate's Review.

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HOW TO ESTIMATE THE SUPPLIER FILL RATE WHEN THE SUPPLY ORDER AND THE SUPPLY LEAD-TIME ARE UNCERTAIN?

RAJEEV KUMAR, IIMM JASHEDPUR BRANCH
rajeevkumar@iimmjamshedpur.ac.in

Abstract : Modern retail supply chains are more and more exposed to risks and uncertainties. Supply risks such as the uncertainty of the supplier fill rate (SFR) directly affect the performance of a retail supply chain. The purpose of this paper is to investigate the supply uncertainty, where the order size and the supply lead-time are considered as decision variables. We aim at developing a more realistic approach to predicting the SFR. Reviewing the relevant literature was the first step taken. We pointed out that while the scientific research on supply risk is growing, the literature lacks an accurate support tool that can predict the SFR. Then, a case study was conducted in order to have a comprehensive view of the real context of SFR parameters. Accordingly, we propose a new approach to predicting the SFR using the bivariate normal distribution. We illustrate the proposed approach using a real case study in TATA STEEL Jamshedpur.

1. Introduction and statement of the problem : Supply chain managers are becoming increasingly aware of the importance of managing supply chain risks effectively. In the real supply chain environment, retailers need to protect themselves from uncertainties in demand and supply. Demand and supply chain planning is very complex. According to Schmitt 2008, the study of supply risk and uncertainty is a growing field. While uncertain demand has been exhaustively explored, the impacts of supply uncertainties are not as well studied. Within the retail supply chain, many inventory control systems are used through the application of ERP. Most of these systems consider the supplied quantities equal to ordered quantities. However, in practice, suppliers fail to deliver the needs in terms of ordered quantities and/or lead-time. The supplier fill rate (SFR) directly affects the performance of a retail supply chain. When the SFR is high, retailers can achieve a given service level to end-consumers while holding less inventory. Most retailers are concerned with the low SFR because not only it contributes to lost sales but also it allows consumers to switch to competitors. (Gurnani et al. 2013) and (Nagarajan and Shechter 2013) studied the ordering decisions of procurement professionals including supplier service level. They found that procurement professionals increase orders for an unreliable supplier, he also explained and examined out-of-stock (OOS) challenges in the independent steel sector. They revealed that the major part of OOS situations in the independent steel sector originates directly from the plant ordering practices and SFR. The researchers call for future work to explore more realistic procurement contexts in order to understand how retail ordering works in. This research is based on a case study in the modern steel product (Steel sheet) supply chain in TATA STEEL Jamshedpur. In this section, we describe the general structure and processes of the supply chain. Then, we present the statement of the problem, the scope and the purpose of this research.

The considered retail supply chain is composed of hundreds of suppliers, a retailer-owned warehouse center (WC), and 90 distributor around the country with multiple formats. Each store carries items with different shape and size. Stocking volume levels vary according to the size of the store and its geographic location. Suppliers replenish some products such as fresh goods directly to the stores. While most of the items are replenished through the WC, the demand in the WC is fulfilled by shipments from the suppliers (Figure 1). In our study, we focus on the items delivered via the WC.

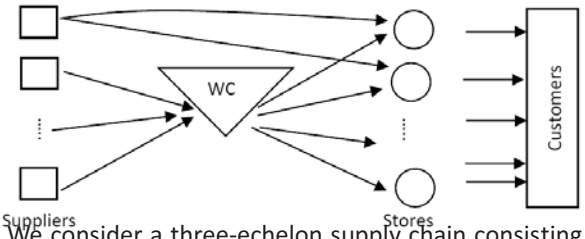

Figure 1. Supply chain configuration

We consider a three-echelon supply chain consisting of one supplier, one WC, and multiples stores. As shown in Figure 2, to control the WC inventory, the manager uses a replenishment policy similar to the standard periodic review base-stock policy (T, S) with random demand and random lead-time. T and S denote review period and base-stock level respectively.

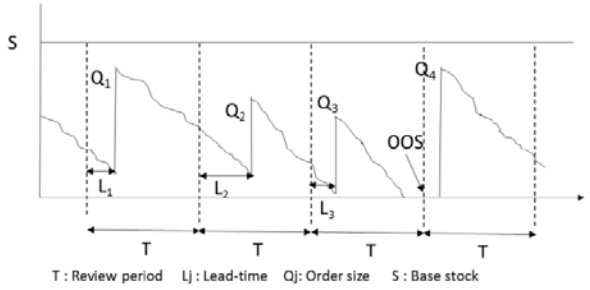

Figure 2. Replenishment policy

The order-up-to-level S is fixed to achieve a desired service level to stores and end-customers. S is obtained using the following formula:

In the real supply chain environment, safety stock is needed to protect against variability. It is commonly known that supplier lead times have a direct impact on the retailer's safety stock. In our case, the WC's manager readjusts S every period based on historical results, demand forecast and professional experience. Many suppliers were unable to fulfil 100% of the order on time. The average percentage of items delivered on time compared to the quantities ordered was approximately 65%. As in many supply chains, the SFR is unknown to the retailer and changes over time. That is why the prediction of the SFR by the managers when sending an order is needed.

We observed that the manager increases order size for an unreliable supplier based on his historical SFR. By managing the supply risks, the SFR may increase and at the same time, the WC in-stock percentage will increase. Moreover, the improved SFR may reduce the amount of safety stock at the WC and stores. Therefore, it is important to analyze the interaction between the WC's replenishment decision (order size and lead-time) and the response of the supplier (supply order and supply lead-time).

Based on the case study, we noted that the SFR randomness was due to the supplier "random yield risk", the "supplier capacity risk", the "lead-time variability", and the "order quality variability". Clearly, this situation indicated that there was a need to improve the WC replenishment practices taking into account the SFR. Through the real case data analysis, we note that we encounter a supplier lead-time/order dependency problem. The WC's replenishment decision depends on the expected supplier's lead-time, whereas the order fulfillment and SFR depend on the replenishment decision (order size and lead-time). In this type of setting, the variability of the order pattern combined with the variability of the lead-time pattern all have an impact on the SFR.

This paper discusses previous research on the supply risk and the diverse parameters and formulation of SFR. Then, it highlights what makes the relationship between SFR and retailer order size (demand) and supply lead-time, in this specific context, different from the previously explored formulations of SFR. Therefore, in such a complex supply chain, statistical models are needed in order to predict uncertain events. Hence, analysis of dependence variables is often required. In recent years, interest in multivariate problems concerning uncertain events has increased. The present work studies the bivariate distribution extension in such a supply chain. In fact, we investigate the relevance of the normal two-dimensional distribution to predict the SFR in this specific situation.

The remainder of this paper is organized as follows. Section 2 reviews the literature and highlights the research gap. Section 3 presents our proposal for a new approach to predicting the SFR. In section 4, we discuss some of our findings through the practical application of the methodology using a real data computational example. Finally, we conclude in section 5 with some perspectives about future research.

2. Review of the literature : In this section, a summary of the main literature on supply risk and uncertainty is provided. The literature on supply risk has been growing over the last decade. According to previous data, supply risk can be defined as the uncertainty associated with suppliers' activities and obligations. It can be divided into two types: disruption risk (supplier is either available or not) and operational risk. The existing research on the operational supply risk focuses on unreliable suppliers. As shown in Table 1, supply risk and uncertainty is often modeled using random yields, random SFR or supply service level (SSL) and supply lead-time variability.

a) Random supply yield : Random supply yield resides in the flow of products from suppliers to the company when it is not on time or of the required quality and quantity. Several factors are linked to random supply yield such as supply lead-time, the production capacity and the product quality that become unpredictable. Yano and Lee present five basic approaches to dealing with supply yield: Bernoulli process; stochastically proportional yield; stochastic yield proportional to order quantity; random capacity; and general model that specifies the probability of each output for each order quantity. (Keren 2009) shows how stochastic supply yield impacts supply chain coordination. In practice, retailers do not know their suppliers' yield distributions and must instead develop forecasts or beliefs about them.

b) Random SFR (or SSL) : Most inventory models assumed that the quantity received is the same as the quantity ordered. However, as mentioned, in practice the quantity received may not match the quantity ordered due to worker's strike, rejection during inspection, damage during transportation, human errors in counting, etc. Accordingly, managers often must make decisions under uncertain quantity received circumstances. In this study, they investigate the continuous review inventory model with shortages including the case where the quantity received is uncertain, in which the lead time, lost sales rate, and order processing cost are decision variables.

There are two types of service levels. Type-1 service level, denoted by á, is an event-based measurement, which describes the proportion of cycles in which no stock out occurs. Type-2 service level, denoted by â, is a quantity-based measurement that not only describes the probability of a stock-out, but also provides an average expected number of backorders or loss for every demand period. The type-2 service level is often called fill rate or item fill rate. â service level is typically considered a more relevant measure of service level compared to á. The type-1 service level can be modeled using relatively simpler expressions and hence appears widely in the inventory literature whereas the type-2 service level is less commonly used in research due the complex form of backorder/loss quantity calculation, which makes it hard to model it. The item fill rate, sometimes referred to as volume fill rate or unit fill

rate, is different to the order fill rate, which applies to the proportion of fulfilled customer orders that may consist of multiple products. Disney investigated the fill rate as an inventory service metric and proposed a new calculation that ensures the target fill rate is achieved without excessive inventory investments.

Previous research on unreliable suppliers studied the distribution of supplier's service level (SFR). According to (Chen et al. 2010), retailers may track changes in the SFR informally, as in the case of a buyer's attitude toward a particular supplier, or formally through the use of automated software and supplier scorecards. They study how a retailer's orders change as it receives information and updates its beliefs about a SFR. He investigated a related model in which a SFR is private information and found that an increased SFR can increase orders for a supplier. For the single supplier case, an increased SFR decreases a retailer's orders. The retailer decreases its order quantity if it is unlikely to receive a smaller quantity than that requested. In a multi-sourcing situation, the retailer may mitigate its supply risk by spreading orders across the suppliers.

With multiple retailers, the supplier's allocation rule becomes nontrivial. This situation has a great impact on the SFR to each retailer. We proposed multi-sourcing models for optimal order allocation in a newsvendor setting under supply disruption with stochastic demand where suppliers are capacity constrained.

We also pointed out the necessity of focusing on the management of key supplier relationships and their importance for overall supply chain performance. According to survey, many retailers have begun to collaborate closely with suppliers to maximize the efficiency of the retail supply chain as a whole. Many retailers use service level agreements (SLAs) to outline performance expectations for their suppliers and specify consequences for failing to meet those expectations. Research on SLAs has explicitly investigated the role of SLAs in coordinating supply chains by motivating suppliers to improve service (Liang and Atkins 2013) (Sieke et al. 2012).

c) Supply lead-time variability : In general, uncertain supply lead-time related to procurement has been discussed at length in the inventory management literature. There is a rich body of literature on supplier-retailer inventory models with uncertain supply lead-time and the effect of supply uncertainty on supply chain performance, supply lead-time uncertainty has long been identified as a fundamental factor influencing inventory decisions. This research has focused on inventory models with stochastic lead-times. We also studied the performances of inventory management systems having deterministic lead times that have been assumed constant, stochastic and exogenous.

Traditional inventory models assumed that lead-time is a constant or random variable, which is not a controllable factor. However, in practice, lead-time could be a decision variable.

d) Concluding remarks : The problem presented in our research and the way it is addressed is different from similar problems in the literature. We do not merely assume the supplier lead-time to be a random exogenous variable, but we include the impact of the order size decision on the supply lead-time and we use the result to predict the SFR. Consequently, in our study we consider orders and lead times as linked factors that affect the SFR. The inclusion of these two dimensions represents a better fit with real-life situations.

According to study, several approaches to the estimation of risks demand the joint distribution of risk factors to be known, which in the analytical approach is frequently the normal distribution.

The models of multivariate probability laws have received particular attention in recent years for the significance they add to the modeling and simulation of events. They emphasized the importance of using the multivariate approach to analyze various correlations between different factors. They worked on determining the optimal periodic replacement strategy taking into account the reliability of the system based on two variables of time and usage. According to authors, the system wears out after a predefined operating time or according to its use. In this context, according to manufacturers, a car tire is replaced after 5 years or after 50000 km.

In the supply chain literature, the use of multivariate distribution is not very common. One relevant research is (Kaki et al. 2015). They analyzed the impact of supply uncertainty on newsvendor decisions for interdependent demand and supply. They derived a solution for a newsvendor facing stochastic supply yield in addition to stochastic demand, and provided a closed-form solution for a specific copula-based dependence structure.

3. The proposed approach : In order to be closer to the practical case study, we are interested in the SFR for a single item. We studied the probability distribution function (p.d.f) of the delivery lead-time (L) and the p.d.f of the order size (Q). In our case, in order to estimate Q we made a Kolmogorov-Smirnov test based on the ordered quantities during one year. We concluded from the hypothesis testing that Q approximates a normal distribution. Similarly, we studied the lead-time (L) variable. Based on collected data we found that the delivery lead-time (in days) can be approximated using a random variable L that follows a normal distribution.

As described in the previous section, for each period Tj, the order quantity Qj and the lead-time Lj are decided in order to minimize the OOS risk at the WC that may occur during the cycle period. Lj is estimated based on the inventory (Ij) to avoid OOS during the supply lead-time. If the lead-time (L) exceeds Lj, the order Qj will be cancelled and another order will be sent to the supplier with other parameters (size and lead-time).

4. Application : We collected weekly observations about a cleaning product. The data cover a total of 12 months "P" and involve information about retailer orders "Q", the supplier lead-time "L", and the quantity received "V".

Table 2. Data analysis

P	1	2	3	4	5	6	7	8	9	10	11	12
Q	381	890	622	530	620	514	523	710	701	702	615	397
L	3.7	4.6	3.4	4	3.7	2.6	3.2	2.2	3.8	1.8	1.9	2.1
V	354	854	460	487	508	395	397	198	560	126	196	337
SFR	0.93	0.96	0.74	0.92	0.82	0.77	0.76	0.28	0.80	0.18	0.32	0.85

In our case, in order to estimate Q we made a Kolmogorov-Smirnov test based on the ordered quantities during one year. We concluded from the hypothesis testing that Q approximates a normal distribution with mean. Similarly, we studied the lead-time (L) variable. Based on the collected data, we found that the delivery lead-time (in days) can be approximated using a random variable L that follows a normal distribution with the following parameter. Therefore, in order to predict the SFR based on the order quantity q and the lead-time l, using Matlab, we implemented the C.D.F. Figure 4 illustrates the result of the SFR based on delivery lead-time and order quantity using an analytical approach.

Therefore, we can predict the SFR using Figure 4. For example, for an order in which Q = 600 units and lead-time L = 2.5 days, the SFR will be about 50%.

In Figure 5 below, we compare the empirical values of the SFR (TS) to the estimated values using our proposed approach (TSA). We note that the proposed formulation for the SFR is a good approximation of the real-life SFR in our case studied.

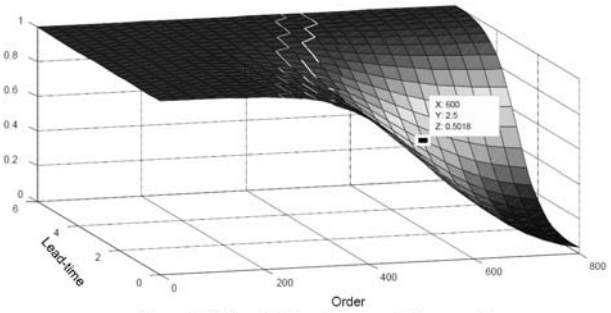

Figure 4. SFR prediction using an analytic approach

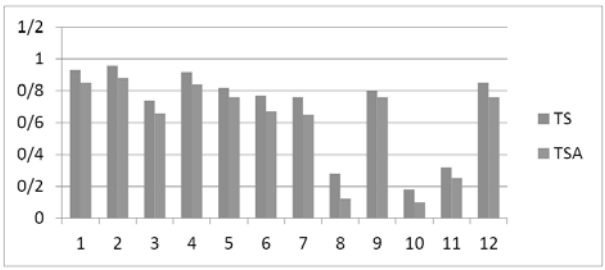

Figure 5. SSL estimation: Analytic approach

5. Concluding remarks and future work : Customer demand, received quantity, etc. cannot be predicted in advance. Therefore, the assumptions of uncertain demand and received quantity may be appropriate for all industries in this world. Additionally, when the demand and lead-time are uncertain, SFR becomes an important issue and predicting it brings several benefits. Our research contributes to the body of work on retailers ordering from unreliable suppliers. It can enrich the existing discussions about estimating the SFR in a specific context, and in turn tackle the mutual dependency that arises in this context (orders are dependent on the lead-time distribution and vice versa).

Moreover, the proposed approach can help the decision maker to estimate the SFR based on a bivariate distribution taking into account the order size variability and lead time uncertainty. Motivated by a real life observation of the ordering process and supplier behavior, we have presented a numerical application of the new SFR measure based on the bivariate normal distribution.

This paper is limited in the use of the normal supply lead-time distribution. In real life situations, we often encounter difficulties in providing a precise estimation of the probability density function due to the insufficiency of historical data. Therefore, for further consideration of this problem, it would be interesting to propose a distribution-free model according to the mean and standard deviation of supply lead-time. It would be also interesting to perform a global sensitivity analysis. Sensitivity analysis will investigate how variation in the output of the numerical model can be attributed to variations of its input factors.

Moreover, information sharing about sales data, inventories and promotion plans may effectively reduce the supply risks threatening the retail supply chains. Efficient Consumer Response (ECR), Vendor Managed Inventory (VMI), and Collaborative Planning Forecasting and Replenishment (CPFR) are strategies of supply chain collaboration that have received considerable attention in the research (Hosseinia and Mehrjerdi 2016).

These strategies have been implemented in the retail supply chain in order to reduce supply risk. It is important to study how these collaboration strategies will improve the SFR and the ordering process.

For instance, (Tannous and Yoon 2018) investigated the relationship between risk, sustainability, and collaboration in Global Supply Chain Management. They concluded that “delivering GSCM optimization between partners through sustainability initiatives mitigates reputational risk exposure from the collaborative efforts among SC stakeholders to increase intrinsic value”.

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12 IMPORTANT THINGS FOR TAXPAYERS UNDER GST FOR 2020

CA BIMAL JAIN
cabimaljain@gmail.com

Along with new hopes and aspirations, New Year 2020 also ushers in certain new changes under the GST, which are important to be considered by the taxpayers.

This article briefly discusses such top 12things/ changes under the GST applicable for New Year 2020:

1. Restriction on claim of ITC: To give effect to the decisions taken in the 38th GST Council Meeting, Central Board of Indirect Taxes & Customs ("CBIC") vide Notification No. 75/2019 - Central Tax dated December 26, 2019 has notified a specific amendment in Central Goods and Services Tax Rules, 2017 ("CGST Rules") reducing the percentage of eligible ITC available for Availment, the details of which have not been shown by the supplier in GSTR-1.

The CBIC had earlier, vide Notification No. 49/2019 - Central Tax dated October 9, 2019, inter alia, inserted a new sub- rule (4) to Rule 36 of the CGST Rules which states that a registered person can claim ITC in respect of invoices or debit notes, the details of which have not been uploaded by the suppliers in GSTR-01 (i.e. not getting reflected in Form GSTR- 2A) only to the extent of 20% of the eligible credit available in respect of invoices or debit notes, the details of which have been uploaded by the suppliers.

However, now, in Rule 36(4) of the CGST Rules, the figures & words "10 percent" have been substituted for the original figures & words of "20 percent" w.e.f January 1st, 2020.

Therefore now, the facility to avail ITC in respect of invoices or debit notes, the details of which have not been uploaded by suppliers in GSTR-1 has been further restricted to only 10% of the total eligible credit.

2. Powers of Commissioner to block ITC under new Rule 86A: The new Rule 86A of the CGST Rules, inserted vide Notification No. 75/2019- Central Tax dated December 26, 2019, grant powers to a Commissioner to decide or vary the

conditions for use of ITC available in the electronic credit register. As per the amendment, a Commissioner may not allow debiting of the amount in the electronic credit register for the discharge of tax liabilities or claim of a refund of any unutilized amounts in the tax register if he has reasons to believe, that such tax credit is:

Availed fraudulently based on invoices from a non-existing person or from a person not conducting any business from any place for which registration has been obtained.

Availed without receipt of goods or services.

Availed on the strength of tax invoices etc., the tax charged in respect of which has not been paid to the Government.

Blocking of generation of E-way Bill, if GSTR-1not filed: Vide Notification No. 75/2019 â•" Central Tax dated December 26, 2019, Rule 138E of the CGST Rules is amended to provide that w.e.f. January 11, 2020, non-filing of GSTR-1 for two consecutive months/quarters would also block the generation of E-way Bill. Thus, the regular filing of GSTR-1 and GSTR-3B in year 2020 should go hand in hand.

4. Mandatory E-Invoicing under GST: In terms of Notification No. 70/2019 â•" Central Tax dated December 13, 2019, w.e.f. April 01, 2020, every registered person whose aggregate turnover (including exempt supplies) on PAN India basis exceeds Rs. 100 crores in a financial year, shall mandatorily generate e-invoices in the case of B2B supplies and report to the notified common portals of GST, which are:

(i) www.einvoice1.gst.gov.in;
(ii) www.einvoice2.gst.gov.in;

(iii) www.einvoice3.gst.gov.in;
(iv) www.einvoice4.gst.gov.in;
(v) www.einvoice5.gst.gov.in;
(vi) www.einvoice6.gst.gov.in;
(vii) www.einvoice7.gst.gov.in;
(viii) www.einvoice8.gst.gov.in;
(ix) www.einvoice9.gst.gov.in;
(x) www.einvoice10.gst.gov.in.

For the sake of adaptability by the taxpayers and integration of common portal with ASP & GSP, these websites will be active w.e.f. January 01, 2020. Therefore, the taxpayers should make necessary changes in their system and IT infrastructure to enable them to generate e-invoices and have a smooth transition to the new system of e-invoicing.

5. Creating QR codes for B2C supplies: In terms of Notification No. 71/2019 â•" Central Tax and Notification No. 72/2019 - Central tax, both dated December 13, 2019, w.e.f. April 01, 2020, Quick Response Code ("QR Code") shall be mandatory in the case where the invoice is issued by a registered person, whose aggregate turnover in a financial year exceeds Rs. 500 crore, to an unregistered person (B2C invoice).

However, where such registered person makes a Dynamic QR Code available to the recipient through a digital display, such B2C invoice issued by such registered person containing cross-reference of the payment using a Dynamic QR Code, shall be deemed to be having QR Code.

6. New GST Returns system: The GST Council in its 31stmeeting had decided that a new GST return system will be introduced for taxpayers. New simplified auto-mated GST returns would be implemented from April 1, 2020, for all taxpayers. This new return system will increase compliance and reduce tax evasion to a larger extent. In order to smoothen the transition to the new return system, a transition plan was approved by the Council and the same was released for information vide a press release dated June 11, 2019.

Under this New Return System, two new forms have been introduced i.e., GST FORM ANX- 1 and GST FORM ANX- 2 which will be e"ective from April 1, 2020.

These forms will be the annexures to the main return GST RET-1/ RET-2/ RET-3, as applicable. GST ANX- 1 (Annexure of supplies) will have the details of outward supplies, import of goods and services and inward supplies liable to reverse charge, meaning thereby where you are going to discharge your tax liability. GST ANX-2 (Annexure of inward supplies) will contain details of inward supplies from registered persons, imports made, and supplies received from an SEZ unit/developer.

7. Quoting of DIN Mandatory by the Department in all Communications: In keeping tune with the governmentâ•™s objectives of transparency and accountability in indirect taxation through the widespread use of information technology, the CBIC has implemented a system for electronic(digital) generation of Document Identification Number (**"** DIN").

The CBIC vide Circular No. 122/41/2019- GST dated November 5, 2019, mandated generation and quoting of DIN on specified documents w.r.t search authorizations, summons, arrest memos, inspection notices, etc., to begin with. However, the CBIC vide Circular No. 128/47/2019- GST dated December 23, 2019has directed that electronic generation and quoting of DIN shall be done in respect of all communications (including e-mails) sent to taxpayer and other concerned persons by any o ce of the CBIC across the country and would be e"ective from December 24, 2019.

Communications issued without DIN which is not covered in the exceptional cases mentioned in Paragraph 3 of the Circular No. 122/41/2019- GST dated November 5, 2019, shall be treated as invalid and shall be deemed to have never been issued.

8. SOP for Non-Filers of GST Return: The tax o cers have been following divergent practices when it comes to the appropriate procedure to be followed in case of non-furnishing of returns by a registered person ("defaulter") under Section 39 or 44 or 45 of the CGST Act, 2017 (**"** CGST Act **"**). Hence, the CBIC vide Circular No. 129/48/2019 - GST dated December 24, 2019, has provided the following guidelines to ensure uniformity in the implementation of provisions of law across field formations â•"-

1. A system-generated message be sent to registered persons 3 days before return filing due date to nudge them to file their returns for the tax period by the due date.

2. A system generated mail/message be sent immediately to all defaulters conveying that the return for the relevant tax period has not been

furnished once the due date for furnishing return under Section 39 of the CGST Act is over.

3. A notice in form GSTR-3A is issued electronically 5 days after the due date of furnishing return to any person who has failed to furnish return under Section 39 of the CGST Act requiring him to furnish such return within 15 days.

4. In case the return is still not filed by the defaulter within 15 days of the said notice, then the proper o cer may proceed to assess the liability of the said person under Section 62 of the CGST Act to the best of his judgment taking into account all the relevant material which is available or which he has gathered and issued order under Rule 100 of the CGST Rules FORM GST ASMT-13. The proper o cer would then be required to upload the summary thereof in FORM GST DRC-07.

5. For the purpose of assessment of liability under Section 62 of the CGST Act, the proper o cer may consider:

The details of the outward supplies available in a statement furnished under Section 37 of the CGST Act (FORM GSTR- 1),

The details of supplies auto-populated in FORM GSTR-2A, Â· The information available from E-way bills,

Â· Or any other information available from any other source, including from inspection under Section 71 of the CGST Act.

6. In case the defaulter furnishes a valid return within 30 days of service of assessment order in FORM GST ASMT-13 then the said assessment order shall be deemed to have been withdrawn as per Section 62(2) of the CGST Act. However, if the said return remains unfurnished within the period of 30 days from the issuance of an order in FORM GST ASMT-13 then the proper o cer may initiate proceedings under Section 78 and recovery under Section 79 of the CGST Act.In deserving cases, based on facts of the case, the Commissioner may resort to the provisional attachment to protect revenue under Section 83 of the CGST Act before issuance of FORM GST ASMT-13.

Further, the proper o cer would initiate action under sub-section (2) of Section 29 of the CGST Act for cancellation of registration in cases where the return has not been furnished for the period specified in Section 29.

9. Reverse Charge (RCM) on Renting of Motor Vehicles: Serial No. 15 of the Notification No. 13/2017-Central Tax (Rate) dated June 28, 2017 ("RCM Notification") has been amended vide Notification No. 29/2019-Central Tax (Rate) dated December 31, 2019, to provide that RCM shall be applicable on the service by way of renting of any motor vehicle designed to carry passengers where the cost of fuel is included in the consideration charged from the service recipient only if the supplier fulfills all the following conditions:â•"

(a) is other than a body corporate;
(b) does not issue an invoice charging GST@12% from the service recipient; and
(c) supplies the service to a body corporate located in the taxable territory.

Vide F. No. 354/189/2019-TRU, it is clarified that the above amendment of the RCM Notification is merely clarificatory in nature and, therefore, shall also apply for the period October 1, 2019, to December 31, 2019.

Apart from the above changes and new systems getting operational in the New Year 2020, this new year holds importance for the following events as well, being carried forward from 2019:

10. Extension of last date for filing of TRAN-1 & TRAN-2: The due dates for furnishing Form TRAN-1 and Form TRAN-2 by the registered taxpayers has been extended to March 31, 2020, and April 30, 2020, respectively, vide Notification No. 02/2020 â•" Central Tax dated January 1, 2020.

11. Waiver of late fees for Non-filing of GSTR-1: In terms of Notification No. 74/2019 â•" Central Tax dated December 26, 2019, if any taxpayer who had failed to file Form GSTR-1 i.e. details of outward supplies of goods or services, from July 2017 to November 2019, then such taxpayers can file such returns till January 10, 2020, and the late fees for the same has been waived o".

12. GST Audit and Annual Return for F.Y 17-18 & F.Y 18-19: The due date for filing GST Annual Return i.e. GSTR - 9 and Audit Report, Reconciliation Statement i.e. GSTR â•" 9C for the F.Y. 2017-18 has been further extended to January 31, 2020.

Further, the due date for filing GSTR - 9 and GSTR - 9C for the F.Y 2018-19 has been extended to March 31, 2020.

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UDYAM REGISTRATION MAJOR CHANGE W.E.F. 1ST JULY 2020 FOR MSME

CA BHARAT P. VASANI
TAXGURU

The Ministry of Micro, Small and Medium Enterprises (MSME) vide its Notification dated 26th June, 2020 has notified certain criteria for classification of an enterprises in MSME category. Under this classification, an enterprises shall be classified as Micro Enterprise, where the investment in plant and machinery or equipment does not exceed one crore rupees and turnover does not exceed five crore rupees.

An enterprises whose investment in plant and machinery or equipment exceeds one crore rupees but up to ten crore rupees and whose turnover exceed five crore rupees but up to fifty crore rupees, then such enterprise shall be classified as Small Enterprise. And where an enterprise whose investment in plant and machinery or equipment exceeds ten crore rupees but up to fifty crore rupees and whose turnover exceed fifty crore rupees but up to two hundred and fifty crore rupees, then such enterprise shall be classified as Medium Enterprise.

Note 1: In case where an enterprise crosses the ceiling limits of either of the two criteria of turnover and investment for existing category, then in such case enterprise will cease to exist in that category and placed in the next higher category according to the criteria of investment and turnover. However, enterprise shall be placed in lower category only if both the criteria of investment and turnover will fulfilled. Note 2: All units having same PAN number but having different GSTIN number shall be collectively treated as a single enterprise and the limit of turnover and investment shall be seen in aggregative for deciding the category as micro, small or medium enterprise.

Application for Udyam Registration:

- Application for Udyam Registration:
- Calculation of value of Investment for Udyam Registration:
- Calculation of turnover for Udyam Registration:
- Udyam Registration Process:
- Udyam Registration of existing enterprises:
- Updation of information and transition period in classification:

For applying as Micro, Small or Medium Enterprises, one needs to apply online based on the self-declaration with no requirement to upload any document for the Udyam registration on Udyam Registration Portal. On successful registration, an enterprise will be assigned a permanent identity number to be known as "Udyam Registration Number" and an e-certificate namely, "Udyam registration Certificate"

Calculation of value of Investment for Udyam Registration: The value of investment in plant and machinery or equipment will be linked to the Income Tax Return filed for the previous year under Income Tax Act, 1961. In case of new incorporated entity, value of plant of machinery or equipment will be based on the self-declaration of the promoter of the entity. In case of purchase of any plant and machinery or equipment, purchase value [exc. GST] will be considered for the value of investment.

The expression "Plant & Machinery or Equipment" of the enterprise shall have the same meaning as assigned to the plant and machinery in Income Tax Rules, 1962 as framed under Income Tax Act, 1961 and shall include all tangible assets (other than land and building and furniture and fittings).

Calculation of turnover for Udyam Registration: For the purpose of calculating turnover of an enterprise for the purpose of classification, all information shall be linked with GSTN portal or Income Tax portal and the value of export will be excluded from the total turnover of the enterprise.

Udyam Registration Process: Udyam registration is completely an online process through Udyam Registration Portal, where no registration fees is payable. Aadhar Number of the appropriate person [Managing partner in case of partnership firm] is mandatorily required for filing registration form.

In case of company, LLP or Co-operative Society or Trust, its authorized signatory shall provide GSTN, PAN and his Aadhaar Number. Note: In case where an enterprise is indulge in more than one type of business or services or both, then such business of services can be specified or added in one Udyam Registration. [Separate registration is not required]

Udyam Registration of existing enterprises: All the existing enterprises registered as EM-Part II [Entrepreneurs Memorandum] or as UAM [Udyog Aadhar Memorandum] shall have to register again on or after 1st July, 2020. And all enterprise registered prior to 1st July, 2020 shall be reclassified in accordance to new criteria and their existing registration certificate is valid upto 31st March, 2021.

Updation of information and transition period in classification: An enterprise having Udyam registration Number [URN] shall have to update its information on Udyam Registration Portal, including the details of ITR and GST returns for the previous year. In case enterprise fails in providing information to Udyam Potal, then it may lead to suspension of its status.

Based on the information filed by the enterprise, the classification of the enterprises will be updated and a communication in change of classification will be sent to the enterprise.

Tags: MSME Registration, MSMED Act, Udyam Registration

Source : Taxguru.in

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MAKE IN INDIA: REINVENTING INDIA'S SUPPLY CHAIN

Whether or not Narendra Modi's ambitious "Make In India" campaign successfully draws foreign manufacturing to India, the proposed infastrucure investments will have a significant impact and lasting consequences for the subcontinent's supply chain.

The "Make in India" Initiative: A Growth Story of Potentials and Challenges

With newly elected Prime Minister Narendra Modi at the helm, India is seeking to emulate the success of Japan, China, and other "Asian Tiger" economies by doubling down on domestic manufacturing with its "Make In India" campaign. Launched on the eve of PM Modi's landmark visit to the United States last year, the campaign seeks to encourage manufacturing in the country and attract international investors and industrialists. The ultimate goal of "Make In India" is to raise manufacturing's contribution to the country's GDP from 15 percent to 25 percent, bringing it more in line with other developing countries like China (31%) and Korea (35%).

PM Modi's government is calling on all of India's ministries related to manufacturing, from heavy industries to telecommunications, in a collective push to make the country more attractive and accessible to foreign investmentors. Currently India is ranked 139th out of 189 countries on the World Bank's Ease of Doing Business Index. The proposed investments are largely focused on reinforcing — and in some geographies building — a reliable infrastructure to handle the supply chain challenges that will accompany a massive influx in manufactured goods.

"My definition of FDI is 'First Develop India' "

— PM Narendra Modi

Though in its early stages, the campaign has already attracted notable participants. Electronics giants Samsung and Sony have recently announced plans to set up manufacturing bases in India. Samsung is reportedly establishing manufacturing units in the country to produce smartphones and tablets, with investments estimated to be between US $500M and US $1B, while Japanese multinational conglomerate Sony is launching an Indian manufacturing unit "very soon," according to Sony's Indian operations head Kenichiro Hibi. China's Ambassador to India Le Yucheng has also said that Chinese firms are expressing interest in setting up manufacturing facilities in India; Chinese e-commerce conglomerate Alibaba Group has already made commitments to serve the Indian market.

The Caution and Challenges of Becoming a Global Export Powerhouse

As the "Make in India" campaign begins to pick up steam with foreign investors, international analysts are beginning to voice concerns about how high the ceiling really is for domestic Indian manufacturing and the export economy. Aashish Mehta, associate professor at the Global and International Studies Program at the University of California, Santa Barbara, cautions that "the sweeping changes in labor laws, land rules, environment regulations, and education policy unleashed by the government come with significant social costs and ultimately may not result in enough good jobs." He cites the reality that mechanization and greater competition from other

developing countries should also be taken into consideration. If the economic climate surrounding "Make In India" changes, foreign companies will be sure to relocate quickly. "Investors seem to get this short-termism," Mehta quipped. He acknowledges the vital importance of having a solid manufacturing base but adds that, "It is just too costly to get wrong."

Indeed international and domestic factors may conspire to scuttle Modi's high hopes for "Make In India" over the next decade. Large scale manufacturing pushes like "Make In India" require a young population willing to work long hours on factory floors. The population of workers aged 15–24 in India and the other BRIC countries is projected to fall by 61 million by 2030 and the over-65-year-old population is expected to rise almost 50% by 2020. Foreign manufacturing companies are more likely to set up shop in other fledgling economies like Indonesia and Mexico where the population of young people is projected to grow rapidly.

Logistical Impacts : Irrespective of the ultimate outcome of Modi's "Make In India," the nature of the subcontinent's supply chain is guaranteed a makeover. The urgency behind Modi's infrastructure initiatives will inspire rapid expansion and hardening of the nation's freight transportation network to accommodate the projected increase in traffic. India's national railway budget was approved earlier this year and included expansions to the nation's total rail freight capacity by 50% to 1.5 billion tons per year.

The supply chain makeover is a much needed one for India. The 7th largest country in the world in terms of land area presents a unique logistical challenge for domestic and international manufacturers. Before any of the planned and proposed improvements to India's infrastructure and domestic bureaucracy are enacted, those considering business involving the Indian supply chain should consider several factors:

A 2014 World Bank survey ranked India 46th in global trade logistics performance, placing it behind some of its biggest competitors for foreign manufacturing investment like Mexico and Turkey

Planned domestic infrastructure improvements will be costly, especially freight rail expansion — expect those costs to lead to higher freight tariffs

Perishable and cold supply chains face a 20% spoilage rate on average due to inefficiencies in India's domestic freight infrastructure*

India is approximately two weeks farther from the United States by shipping line than China

Frequent power outages may cause delays in manufacturing schedules and an increased likelihood of defective parts

The Indian bureaucracy itself poses a challenge: government processes are complex and confusing, and have the potential to cause further delays and frustrations

India lacks a developed supply base: raw materials and parts are still often imported for production

The import process to the country remains complicated and non-standardized, causing higher than normal requirements for inventory to offset unpredictable delays

The lingering question remains: will Modi's many infrastructure investments bear fruit in time to attract enough foreign manufacturers to call "Make In India" a success? As the country enters into this period of rapid industrial growth, the already struggling logistical performance of India is almost guaranteed to suffer in the short term . Public works projects on existing rail lines and roads are sure to cause delays in an already heavily backlogged transportation system. Congestion at major ports is also likely to worsen due to an inability to quickly acclimate to increased traffic as more international manufacturers move to India. Until India begins to see returns on its domestic investments, the unavoidable headaches, bureaucracy, and delays that come from gambling on the Indian Supply Chain threaten to eliminate any savings foreign manufacturers may see from moving to India.

Source : ELEMENTUM NEWS DESK

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MEITY-NITI LAUNCHES DIGITAL INDIA AATMANIRBHAR BHARAT APP INNOVATION CHALLENGE TO REALISE PM'S VISION OF DIGITAL INDIA – AATMANIRBHAR BHARAT

EXISTING APPS ARE TO BE PROMOTED IN TRACK 1 OF APP INNOVATION CHALLENGE

THE TRACK 2 OF THE CHALLENGE FOCUSES ON DEVELOPMENT OF NEW APPS

With an objective to support and build a strong ecosystem for Indian Apps, MeitY in partnership with Atal Innovation Mission – Niti Aayog launches **Digital India AatmaNirbhar Bharat App Innovation Challenge** for Indian tech entrepreneurs and Startups. This is to help realise the vision of Prime Minister for building a Digital India and using Digital Technologies for building an AatmaNirbhar Bharat.

This shall run in 2 tracks: Promotion of Existing Apps and Development of New Apps.

The focus of the Track 1 App Innovation Challenge, being launched today is to identify the best Indian Apps that are already being used by citizens and have the potential to scale and become world class Apps in their respective categories. This Innovation Challenge with various cash awards and incentives of featuring Apps on Leader Boards seeks to create an ecosystem where Indian entrepreneurs and Startups are incentivised to ideate, incubate, build, nurture and sustain Tech solutions that can serve not only citizens within India but also the world. The Mantra is to Make in India for India and the World. This shall be completed in a month.

Subsequent to this App Innovation Challenge, Government will also launch Track 2 of the AatmaNirbhar Bharat App Innovation Challenge that will seek to identify Indian start ups / entrepreneurs /companies and encourage them with ideation, incubation, prototyping and roll out of applications. This track will run for a longer course of a time, details of which shall be provided separately.

The AatmaNirbhar Bharat App Innovation Challenge Track 1 is being launched in the following 8 broad categories:

1. Office Productivity & Work from Home
2. Social Networking
3. E-Learning
4. Entertainment
5. Health & Wellness
6. Business including Agritech and Fin-tech
7. News
8. Games.

There may be several sub categories within each category.

The Innovation Challenge will be available on innovate.mygov.in/app-challenge from 4th July 2020. The last date of submission of entries is 18th July 2020. The applicants need to apply online to submit their proposals by registering and logging on to the MyGov portal - www.mygov.in.

A specific Jury for each track with experts from Private Sector & Academia will evaluate the entries received. Shortlisted Apps will be given awards & will also feature on Leader boards for information of citizens. Government will also adopt suitable Apps, guide them to maturity and list on Government e-Marketplace (GeM).

Some of the Key Evaluation parameters will include Ease of use (UI/UX), Robustness, Security and Scalability

Source : PIB

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ROAD TRANSPORT MINISTRY NOTIFIES STANDARDISED TRANSPORT VEHICLES DIMESIONS ON INTERNATIONAL NORMS

The Ministry of Road Transport and High ways through GSR No. 414 (E) dated 26th June 2020, has published a notification to amend Rule-93 relating to dimensions of motor vehicles under the Central Motor Vehicle Rules 1989.

These amendments would provide for standardization in the dimensions of the Motor Vehicles which would be in line with international standards and further a step by the Ministry to improve the logistics efficiency in the country as the enhanced dimensions would provide for extra passengers or extra carrying capacity within the prescribed weight.

The Amendments inter-alia include to provide for Dimensional details in respect of two wheeled vehicles (L1 and L2) which were not prescribed till now has been prescribed. L2 to Length of max 4 mtr height 2.5 mtr as per EU norms , three wheeler (L5 M/L5 N) height has been increased from 2.2 to 2.5 mtrs and Pneumatic trailer through this notification has been made at par with Modular Hydraulic Trailer and it is expendable upto 50 MTR without increase in load to facilitate transport of goods of exceptional length.

Road Trains with length at par with EU as 25.25 mtrs have been proposed to be included on select routes.

The dimension, particularly the height of the N category vehicles (goods vehicles) has been amended to encourage containerized transport.

The dimensions, particularly the height of the M category vehicles has been amended from 3.8 meter to 4.0 meter except in the case of Airport passenger bus (retained at 3.8 meter), in line with international UNECE standards.

The length of the M3 (buses) with two axles is amended from 12 meters to 13.5 meter.

In case of N category of goods vehicles, height has been amended from 3.8 meter to 4.0 meter except in case of N1 category of vehicles (N1 are utility vehicles with GVW up to 3.5 tons) where the height has been restricted to 3.0 meter.

The length of the Trailers (T category) is amended from 18.0 meters to 18.75 meter to accommodate ISO standards containers of 45 ft. The height of the trailer is amended from 3.8 meter to 4.0 meter with certain exceptions.

Semi trailers carrying ISO series/ freight containers or fabricated/refrigerated containers or with containerized body shall not exceed 4.52 meter.

In case of Truck-trailers/ Tractor-trailer engaged by Auto manufacturers to carry motor vehicles/ construction equipment Motor vehicle/ livestock / white goods with closed body or meant to carry indivisible loads, the overall height of the motor vehicle shall not exceed 4.75 meter.

In case of invisible load following relaxations are made with respect to dimensions namely:

-200 mm projection on each lateral side permissible in case motor vehicle has the actual width as 2.6 meter subject to height up ato 4.75 with certain conditions namely.

-In case of mechanical trailers carrying goods of exceptional length (for eg. wind mill blades), the trailers with extendable length are proposed to be included.

Source : PIB

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VOCAL FOR LOCAL: HERE IS HOW MANY INDIANS CARE ABOUT 'COUNTRY OF ORIGIN' WHILE BUYING ONLINE

The Modi government has asked all ecommerce companies to ensure that the 'country of origin' of all products is clearly listed on their platforms.

RAMARKO SENGUPTA

Most Indians buying online are more interested in price, delivery date, ratings, and reviews, than the 'country of origin' information about the products they are looking to purchase, according to a survey asking consumers "what all information do they generally look at when buying a product from an ecommerce platform".

An overwhelming 83 percent of those who participated in the survey said they look for ratings and reviews when buying online through ecommerce platforms, while 82 percent said they look for price and delivery date. Only 37 percent said they look for the 'country of origin'.

The survey, conducted by social media firm LocalCircles, comes in the backdrop of a recent communication from the Ministry of Commerce that asked all ecommerce companies operating in India to ensure the 'country of origin' of all products is clearly listed on their platforms. According to a Bloomberg report, ecommerce giants, Amazon and Walmart-owned Flipkart, have agreed to "compel merchants to start prominently displaying 'country of origin' for all goods sold online in India".

The ministry's regulatory demand comes on the back of the India-China standoff earlier this month, which left 20 Indian soldiers dead and around 76 injured, leading to a 'boycott Chinese goods' clamour. China is often referred to as the 'world's factory'.

On Sunday, Prime Minister Narendra Modi, during his monthly Mann Ki Baat radio programme, once again reiterated that citizens must lend their support in making India self-reliant or atmanirbhar and become 'vocal for local' in a bid to support the country.

The social media firm's survey, which received over 16,300 responses from across 239 districts of India, also revealed that the MRP (maximum retail price) and discount information is sought by 82 percent consumers, while 62 percent ecommerce consumers seek 'best before' date on human consumption products.

"Price and delivery date was of prime importance to all ecommerce customers," LocalCirlces said.

The Department for Promotion of Industry and Internal Trade (DPIIT), which is under the Ministry of Commerce, on Wednesday reportedly held a video conference with ecommerce companies — Amazon, Flipkart, Snapdeal, and Paytm Mall — to discuss displaying the 'country of origin' of the products on their platforms. LocalCircles Chairman and CEO, Sachin Taparia, highlighted that, "The term 'country of origin' is open to interpretation as a product could have the majority of its components originating in one country, while the final assembly could have happened in a different country, and most sellers do not have an easy way of knowing that.

"Therefore, instead of the seller filling up the field manually, it may be easier to have the sellers upload the image of the principal display panel along with product images." Earlier, the Confederation of All India Traders (CAIT) had urged Commerce and Industry Minister, Piyush Goyal, to make it mandatory for every ecommerce portal to mention 'country of origin' on every product sold on their platforms, "so that buyers can make an informed decision".

Last week, the Government e-Marketplace (GeM) platform, a special purpose vehicle used by government departments for public procurement, made it mandatory for sellers to enter the 'country of origin' while registering all new products on the portal.

Source : yourstory.com

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MSME WOES
LARGE CORPORATES WITH STRONG LIQUIDITY HOLD UP NEARLY RS 3.3 LAKH CRORE IN PAYMENTS: REPORT

The report notes that despite the MSME-focussed steps announced by the Centre as part of the financial relief packages, the sector continues to experience stretched liquidity "given the long credit period extracted from MSMEs by large corporates, many of which have sufficient liquidity of their own."

Tanya Khandelwal @TanyaKh_23

Liquidity issues faced by micro, small and medium enterprises (MSMEs) in India have been aggravated due to the novel coronavirus, or COVID-19, pandemic and the lockdown that followed. Even as almost every sector of the economy was dealt an unprecedented blow by the pandemic-led lockdown and halt in business activity, small businesses were among the worst-hit.

As per a report by credit rating agency Brickwork Rating, close to Rs3.3 lakh crore worth of MSME funds are stuck with strong large corporates in the form of receivables. This is one of the many challenges faced by MSMEs. Two key things intensified the cash crunch being faced by MSMEs during the lockdown —lack of formal funding from the banking system and the delay in payments, the report noted. Many small businesses are plagued by the issue of a stretched working capital due to delayed payments by buyers (private or even the government). In the case of large corporates, MSMEs witness delayed payments for materials supplied or services provided due to their low bargaining power with such entities.

The lack of access to formal funding from the banking system, a perennial problem that has plagued the sector, has seen recent government intervention. The Rs 3 lakh crore in collateral-free loans being provided to MSMEs in the form of an Emergency Credit Line Guarantee Scheme under the Atmanirbhar Bharat package is one such move to ease the sector's woes and help them mitigate the crisis that has reared its head amid the COVID-19 pandemic. Finance Minister Nirmala Sitharaman on June 22 said the total amount sanctioned under the Emergency Credit Line Guarantee Scheme (ECLGS) by public sector banks and private banks stood at Rs 75,426.39 crore, of which Rs 32,894.86 crore has already been disbursed.

The report, however, notes that despite the MSME-focussed announcements made by the Centre as part of the financial relief packages, the sector continues to experience stretched liquidity "given the long credit period extracted from MSMEs by large corporates, many of which have sufficient liquidity of their own." The study by Brickwork noted that while some such corporates have weak liquidity and credit profiles, which drives them toward extracting the maximum credit from their suppliers (MSMEs), others have strong credit profiles and liquidity.

Rajat Bahl, Chief Ratings Officer, Brickwork Ratings, said, "Even if 50 percent of the funds held up by strong large corporates with high creditor days are released, it will shore up liquidity for the MSME sector by around Rs 1.6 lakh crore and significantly reduce their liquidity pressure and working capital burden."

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GOVT MAKES COUNTRY OF ORIGIN MANDATORY FOR GEM PLATFORM

- GeM has taken this significant step to promote 'Make in India' and 'Aatmanirbhar Bharat'
- PM Modi has been rooting for the need to make India 'self reliant' by investing in indigenous products and push country's 'Make in India' cause

In a bid to promote self-reliant India and push country's 'Make in India', online trading platform for state-run agencies – Government e-Marketplace (GeM), has made it mandatory for sellers to mention 'country of origin' on products they wish to sell through the platform. "Information about Country of Origin by the sellers made mandatory on GeM," Finance Minister Nirmala Sitharaman said in a tweet.

Information about Country of Origin by the sellers made mandatory on GeM.

Further, sellers, who had already uploaded their products before the introduction of this new feature on GeM, are being reminded regularly to update the Country of Origin, with a warning that their products shall be removed from GeM if they fail to update the same. GeM has taken this significant step to promote 'Make in India' and 'Aatmanirbhar Bharat'.

GeM has also enabled a provision for indication of the percentage of local content in products. With this new feature, now, the Country of Origin as well as the local content percentage are visible in the marketplace for all items. More importantly, the 'Make in India' filter has now been enabled on the portal.

Buyers can choose to buy only those products that meet the minimum 50% local content criteria. Since its inception, GeM is continuously working towards promotion of 'Make in India' initiative.

Prime Minister Narendra Modi has been rooting for the need to make India 'self reliant' by investing in indigenous products and push country's 'Make in India' cause.

"The state of the world today teaches us that an Atmanirbhar Bharat "Self-reliant India" is the only path." PM Modi had said last month while announcing the [1] 20 lakh crore stimulus package amid the coronavirus crisis.

●●●

BRANCH NEWS

- ALWAR BRANCH
- BANGALORE BRANCH
- PUNE BRANCH

ALWAR BRANCH

IIMM, Alwar branch conducted a survey of Mineral Industries of Alwar. During the survey of the mineral industry association it was a shocking to the visiting team that because of the CORONA the Delhi and Ghaziabad is almost closed and the main customers of Alwar Mineral Industries are from Delhi and Ghaziabad.

Similarly the KAJARIA Ceramics the 2nd largest producers of Tiles has is also suffering due to shortage of m workforce as well as clitages. We also visited the Parbatsar, Kishangarh, and Makrana marble industries, similar statements were given by the most of the traders and manufacturers. The Bhilwara Textile Hub has suffered the most in textile industries. Now it is working up to the 35% capacities. Some of the MSMEs in textile, Mineral industries are facing closure.

Though the central government has given some packages to the industries, but that is in the form of loan and advances, which is not sufficient to again bring back the industries at the level of beforestart of the year 2020. Banks are reluctant to sanction loan, even if loans are taken by industries. Neither have the workforce nor the customer. from where the industry will repay the loan. From the feedback of Industries in my opinion it will take another 10-12 months for the industries to achieve the level of february 2020 with the active support of the state as well as central government.

BANGALORE BRANCH

16.05.2020 - WEBINAR : Indian Institute of Materials Management, Bangalore Branch and WTC, Bangalore jointly organized a Webinar for Supply Chain Professionals on 16.05.2020. The theme of the Webinar was **'Covid 19: Managing the Challenges in Retail Sector'**. Dr. Anil Chinnabhandar, Senior Vice President, Landmark Group and a specialist in the Omni-Retail domain, spoke on subject. More than 200 participants attended the Webinar. The Question & Answer session was the highlight of the event. Dr. Anil Chinnabhandar answered more than 50 Queries of the participants in detail. Very good feed back received from the participants

27.06.2020 -WEBINAR : Indian Institute of Materials Management, Bangalore Branch and WTC, Bangalore jointly organised a Webinar for Supply Chain Professionals on 27.06.2020.

The theme of the Webinar was **'Auto Sector Pre & Post Covid 19: Challenges and Strategies'**.

Mr. H.B. Thontesh, Vice President-Commercial, Bosch Limited, Bidadi, Bangalore, spoke on the various issues the Auto Sector had to cope with like economic slowdown and implementation of Bharath Stage VI Emission Norms prior to March 2020 , and the Lockdown post COVID 19 being declared as a pandemic. He touched upon various aspects like E Mobility, shift in Customer preference towards small Cars and used cars, need to conserve cash and Auto Component majors' role in supporting MSMEs. He presented a balanced view of the future for the automobile sector outlining the Challenges faced and possible strategies to bounce back. More than 100 participants attended the Webinar. The Question & Answer session was the highlight of the event. Mr. Thontesh answered more than 75 Queries of the participants in detail. The feedback from the participants has been highly appreciative of the relevance of the theme and the take-aways from the Webinar.

PUNE BRANCH

An online Webinar Lecture on **"Let's Reboot Our Life** "was held on Saturday, 6th June 2020 from 7pm to 8.30 pm. Mr. Dilip Patel, the Guest Speaker, is a Senior Facilitator & Course Director at Initiatives of Change. He is an Engineer, Entrepreneur and a certified Zentangle trainer with 25 years of professional experience. He has conducted various learning programs since 2012 to help people balance life with his unique concepts.

The Chairman, Mr. Terrence Fernandes welcomed all the members for the session & discussed about upcoming activities of the branch. He also encouraged on membership growth and its benefits & collaborating for new activities to create some value addition which will pave the way to achieve growth and success. The Speaker has developed a unique process called "Life Balance Sheet" which helps one to take charge of his life as its CEO to bring about the changes towards meaningful outcomes. He explained this concept stating that we get so busy in our lives without a proper discipline and consistency in it to achieve our goals. This concept has been a real fact since ages and has proved time and again that, if person wish to fulfil his dreams then, he should inculcate a discipline in its routine life and maintain it. Anything big and great to happen in this world takes time however, the person should also take control of his life and design a proper roadmap to achieve its goals. There are many things around us which we are not able to see or rather we tend to ignore but are important and worth doing it. Success cannot be measured only by money but a basket and balance of all the things which bring change in our and other's lives in the right context. Finally everyone will get his own share of success, failure, luck, happiness, fame, money, power etc. however in order to achieve it, we should first become CEO of our life and then measure the outcome.

The program was attended by 50 members. After the presentation, followed a session of questions & answers to clear the doubts and share the thoughts. The Honorable Secretary, Mr. Prasad Rao concluded the session with a vote of thanks and as a token of appreciation presented a digital copy of Memento online to the speaker Mr. Dilip Patel.

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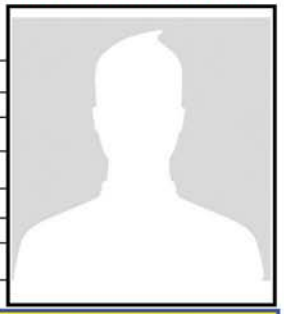

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EXECUTIVE HEALTH

BP ISSUES MORE COMMON EVEN AMONG YOUTH: 5 FOODS YOU MUST AVOID TO KEEP YOUR HEART HEALTHY

ANUSHREE GUPTA

The food we eat and the drinks we consume have a direct effect on our body, especially vital organs such as the heart. Here are 5 foods you must avoid if you are trying to keep your blood pressure stable.

KEY HIGHLIGHTS

- Our diet has a direct impact on our heart and other vital organs
- Foods rich in salt can lead to high BP, which can damage the heart
- Here are 5 foods you must avoid if you are trying to keep your blood pressure in a healthy range

The heart is one of the most vital organs of the body. The heart performs the function of pumping blood to all parts of the body. The circulatory system is made of the heart, blood vessels, arteries, and veins. One common term that we hear very often in relation to the heart is Blood Pressure. Blood pressure, as the name suggests, is the pressure that the heart has to assert on the blood to circulate it to other parts of the body.

Under normal circumstances, blood pressure remains in a healthy range. However, many factors, including our diet can affect blood pressure and cause it to increase, due to thick artery walls or other reasons. While high blood pressure has mostly been associated with elderly people, as stress and poor diet among young people gain momentum, people in their 20s are also experiencing hypertension issues.

5 foods to avoid if you are suffering from blood pressure issues

Salt – Almost anyone who has had blood pressure issues or knows someone who has, is definitely aware that consumption of salt should be avoided when you have hypertension issues. According to Bloodpressureuk.org, eating salt raises the amount of sodium in your bloodstream and wrecks the delicate balance, reducing the ability of your kidneys to remove the water. The result is a higher blood pressure due to the extra fluid and extra strain on the delicate blood vessels leading to the kidneys.

Processed food and meat – Processed food, including meat, contains a lot of sodium, which as mentioned above, can lead to a rise in blood pressure. If you are facing blood pressure issues, it is extremely important to cut down on the consumption of processed and junk food that may be extremely rich in sodium.

Canned food – Canned food is convenient and we all know it, but canned food can be extremely high on salt, as it helps to preserve the food for longer, increasing their shelf life. While it may be okay to consume canned food once in a while, you must refrain from making it a regular part of your diet.

Sugar – While it is the opposite of salt, sugar can also increase your risk of blood pressure as it adds to obesity, weight gain, and imbalances in the body. According to the American Heart Association, men and women should limit their sugar intake at 9 and 6 teaspoons respectively, for a healthy heart.

Alcohol – Alcohol is known to directly affect the liver, but very few people know that it can play a role in increasing your blood pressure as well. Studies have associated binge and regular drinking with hypertension and poor heart health. While certain drinks like red wine, consumed in moderation, are linked with better heart health, it is important to know where to draw the line.

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TH-01(West) Sector - 4, Near Mahila Thana
Dist: Sundergarh, Rourkela-769002 (Odisha)
Cell: 08260711943/08895501056
Email: iimm.rourkela@gmail.com

SURAT BRANCH
Indian Institute of Materials Management
C/o. Mr. Dilip Dhabarde, Hony Secy.
Manager Matls, Krishak Bharati Co Ltd
PO: Kribhaco Nagar, Nr. Kawas Village
Suresh-394515, Tel: 0261-2802682
E-mail : dilipdhabarde@kribhco.net

TRIVANDRUM BRANCH
Indian Institute of Materials Management
TC-9/1447, 2nd Floor,Future House
Temple Road, Sasthamangalam
Thiruvanathapuram - 695010
Ph. : 0471-2724952
E-mail : iimmtvpm@gmail.com

UDAIPUR BRANCH
Indian Institute of Materials Management
2nd Floor, Above Manohar Furniture
Ashwini Marg, Udaipur - 313001
Ph.: 0294-2411969/2421530
E-mail : iimmudpr@sancharnet.in
iimmudpr@gmail.com

VADODARA BRANCH
Indian Institute of Materials Management
2nd Floor, Vishal Chambers, 34, Vishwas
Colony, B/h Alkapuri Shopping Centre,
Alkapuri, Vadodara - 390007
Ph.:0265-2359060/2353410/M: 7043959060
E-mail : iimmbrd@yahoo.co.in,
iimmvadodara@gmail.com
iimmbaroda@gmail.com,
www.iimmvadodara.org

VAPI BRANCH
Indian Institute of Materials Management
301, Fortune Mall, Above Vishal Mega Mart,
VIA Road, GIDC, Vapi - 396195
Ph.: 09825119364 / 08758294011
E-mail : iimmedu.vapi@gmail.com

VISAKHAPATNAM BRANCH
Indian Institute of Materials Management
C/o. A V Rajendra Kumar
Droo No. 39-8-34/4 & 5, Sector - 8,
Muralinagar, Visakhapatnam - 530007
Ph.: 0891-2704757 / 9701347694
E-mail : iimmvizag@gmail.com

V U NAGAR BRANCH
Indian Institute of Materials Management
Champs Engineering, 1-52, GIDC Estate
Vitthal Udyognagar - 388121
Tel: 02692-230440/ 09825028050
Email: harshad.champs@gmail.com

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