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MATERIALS MANAGEMENT REVIEW



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EMERGING TECHNOLOGIES SHAPING THE *Future of Logistics*





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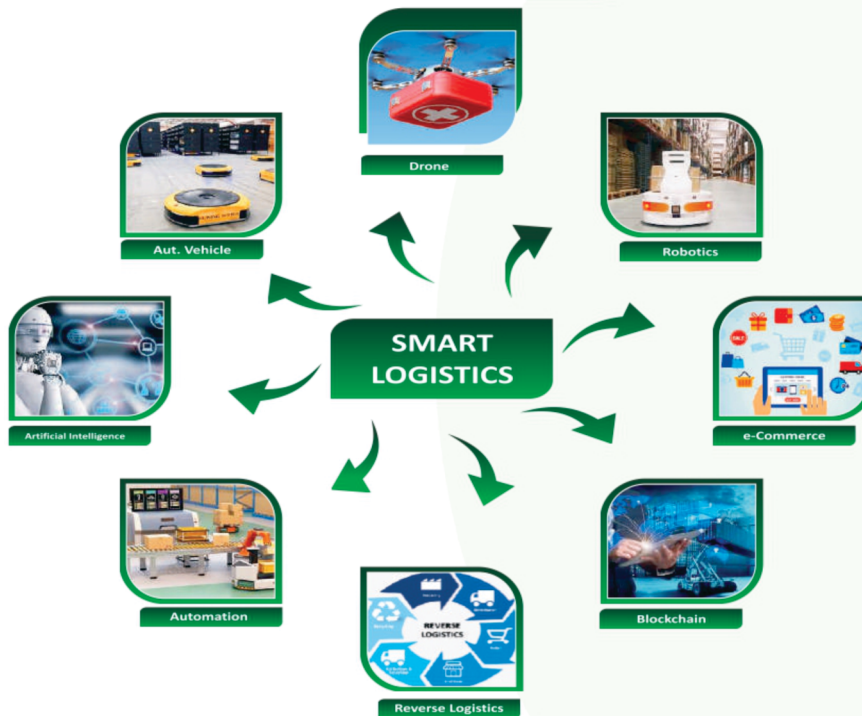
12th Edition of

Spectrum2020

Cross Industry Learning Powered by **SCINNTC**

Theme:

SMART LOGISTICS ENABLES SCM 4.0



Event date: Friday, 21st February, 2020

Venue: MMA Auditorium

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In Pursuit of Excellence in Supply Chain Management
INDIAN INSTITUTE OF MATERIALS MANAGEMENT
4th Floor, "Chateau D Ampa", 110, (New No. 37) Nelson Manickam Road
Aminjikarai, Chennai - 600 029, Tel: 044-2374 2750 / 2374 2195
Email: admin@iimmchennai.org; web: www.iimmchennai.org



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From the Desk of The National President



Dear Members,

Greeting from National President!!

Several important events took place in IIMM calendar during last one month. One of the most vibrant Branch in Northern Region, Raibareli, hosted a regional conference on the theme 'Sustainable Supply Chain Management in Public Health Industry on 16th December 2019 . Several renowned speakers from healthcare sector shared their thoughts on the subject. Sr. Vice President of IIMM Sh. H.K.Sharma set the tone of the conference by speaking at length the various areas which are covered under the Public Health Industry.

Chandigarh Branch celebrated their 35th Annual Day SCM Conclave and Award Ceremony on 27th December 2019. This is one of the most sought after event hosted by Chandigarh Branch every year which was well attended. The National Executive Committee held their Business Plan meeting on 5th January 2020 in Goa. A clear roadmap was set for the next 2 years period. An ambitious target was set for all round growth of IIMM in the field of Education, membership growth, Training & Consultancy, Research activities etc. All the participants of the business plan meeting deliberated at length about the various transformation required to be done to improve the visibility as well as improve the overall business scenario. The members also discussed regarding the various governance and compliance issues which will be adhered to over next two years period.

Mumbai Branch organized a one day National Summit on Public Procurement on 10th January 2020. Top officials such as Member Railway Board, Chief Technical Office(from the Office of CVC), Director (Law) from Competition of India and several Heads of Procurement from large Public Sector undertaking participated as Speakers in the event.

It will be a constant endeavor of the new leadership team of IIMM to execute the plan on ground In a time bound manner by clearly fixing the roles and responsibilities as well as constantly review and monitor the progress on periodic manner.

With Warm Personal Regards

A handwritten signature in black ink, appearing to read 'Malay Mazumdar'.

Malay Mazumdar

National President, IIMM

Email: Malay_mazumdar@yahoo.co.in

From the Desk of Chief Editor



Dear Members,

The term, “logistics” originated from Military actions in supplying equipment and supplies to troops. However, Logistics as a business concept evolved in 1950s and is still evolving with ever increasing complexity of satisfying business needs. Today, Logistics has become an essential part of an organization’s strategy and is being utilized to plan and organize the development of products conveniently, secure, and successfully.

It is important to underline the importance of Logistics Industry in Indian Economy. The value of Indian Logistics Industry in 2019 was USD 160 Billion and is expected to reach USD 250 Billion in 2020 thereby creating huge employment generation. The growth in Indian Logistics Sector can be attributed to various initiatives taken by Govt. from time to time. Few of them are, Providing Infrastructure Status to Logistics Sector, Creating Logistics Division in Department of Commerce, Boosting Manufacturing under Make in India, Introduction of GST, Relaxing the FDI Norms and National Logistics Policy etc.

It is very much evident that, Logistics Industry is bound to grow in coming years, but this growth will not be spared from existing and upcoming challenges. One of the main challenges is to bring down the logistics costs from 14-15% to 8-9%. Last Mile connectivity, Efficient Fleet Management, Multi Modal Transport, Transparency, skilled manpower, Integration of technology advancements across the whole supply chain and Infrastructure development are other challenges which needs to be addressed on priority.

Roads are by far the most common mode of transport prevalent in India which carries around 60% of cargo movement while railways caters for 32% of cargo movement and rest is done by the coastal shipping, airways and inland waterways.. In order to enhance the logistical efficiency, Govt. of India, has come up with new initiative of Multi-Modal Logistics Parks (MMLPs) which will improve the country’s logistics sector by lowering overall freight costs, reducing vehicular pollution and congestion, and cutting warehousing costs.

Efficient Fleet management is another important cost savvy technique which allows a fleet manager to access real time fleet location, real-time traffic details, and delivery time calculation. It saves a large amount of cost and time lost with instant re-routing in heavy traffic and bad weather conditions. Fleet management ensures safety and on-time delivery of the product.

Looking at the broader aspects of Technology Integration such as Artificial Intelligence, Machine Learning and Internet of Things with logistical operations, it will not only streamline the inefficient processes be it transportation, cargo location & state of the product, storage and delivery of the product but also significantly reduce the errors and hence logistical costs.

Through National Logistics Policy, Government is focusing on development of fully integrated logistics network with modern technology and automation. India’s road, rail, port, airport and inland waterway coupled with Technological Upgradation have added a new dimension in the logistics growth story, creating a huge platform for future expansion of logistics Industry.

A handwritten signature in black ink, consisting of a stylized 'M' and 'K' followed by a surname.

(DR. M.K. BHARDWAJ)



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**Indian Institute of Materials
Management**

4598/12 B, 1st 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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INDIAN INSTITUTE OF MATERIALS MANAGEMENT

4598/12 B, 1st 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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SUPPLY CHAIN CHALLENGES IN PETROL PUMP OPERATIONS – A CASE STUDY OF PETROL PUMPS / FUEL STATIONS IN KERALA

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

Abstract : This paper is written based on total dealership development programme conducted for a leading energy selling company in India with reference to their dealers spread across in Kerala. The author had coordinated the two day programme on total dealership development from 2015-2017. More than 460 dealers were undergone the programme covering various topics like leadership / self-development, monitoring & recruiting manpower, brand building, best sales practices customer relationship management activities, and profitability improvement. Based on the participants feedback, interaction, outcome of group activities, the supply chain challenges faced by retail outlets (ROs), concern areas were identified. This paper focusses the downstream supply chain operational challenges i.e retail outlets to customers .The key concern areas are: supply replenishment, retail outlet operations, manpower issues, meeting the customer requirements, non-fuel selling revenues, customer relationship management practices, and business results related issues.

Keywords: Fuel stations operations, supply chain challenges, best practices, non-fuel revenues

Introduction : Supply Chain Management (SCM) involves the flow of the entire organizations set of activities, materials and other resources required to produce and deliver the product to the final customers /end user. SCM can be defined as an integrated approach to manage the total flow of a distribution channel from the supplier to the ultimate user (Schary & Skjott-Larsen, 2001). The supply chain of the petroleum industry is extremely complex compared to other industries. The upstream supply chain includes the sourcing of crude oil, & refining and the downstream supply chain includes the bulk storage terminals, and depots, retail outlets, touch points etc.

The value chain of petroleum industry is very unique and complex. It is the only industry which has one input and a range of products. Pricing of each products is very complex and difficult. Products prices are again controlled by the government. It is important for the company to have a strategy in place in order to compete in the global economy (Chivaka, 2007). Figure

1 shows an example of a typical petroleum value chain.

Crude Production — Refining —Wholesale—Retail Marketing

Figure 1 Value Chain of Petroleum Industry

The value activities identified along this particular supply chain include; refining, including crude sourcing, distribution and marketing (Rusinga, 2010).

Petroleum Supply Chain ; Petroleum supply chain includes crude forwarders / suppliers (oil producing countries), refineries – processing the crude into final products and intermediate products, delivery through pipeline, wagons, heavy trucks, bulk handling containers through rail / sea, terminal and depots- storage facilities, outbound logistics through medium / heavy trucks and retail outlets (ROs). Figur2 shows as example of petroleum supply chain (Moore, 2005)

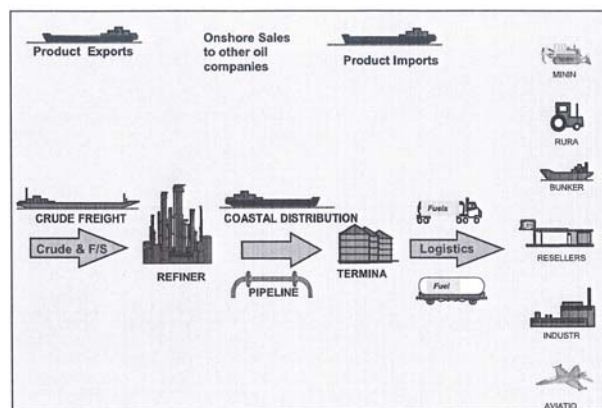


Figure 2 Petroleum Supply Chain

Methodology Adopted : A case study method was used to collect and analyse data. A case study can be defined as an inquiry that investigates a contemporary phenomenon within its real life context, especially when the boundaries between the phenomenon and the context are not clearly evident (Yin, 2003).

Background of the Study : Two day total business development programme was offered to the retail outlets / petrol pumps owners/dealers / managers in Kerala between 2015 and 2017. These participants are proud retail outlets of a leading public sector energy

selling company in India. This company is a 'Fortune's Global 500 listed business enterprise with a turnover of Rs.6, 05,924 crs (USD 87 billion in 2018-19). This company is diversified, integrated energy major with presence in almost all the streams of oil, gas, petrochemicals and alternative energy sources with a dealer network of 27,700 plus fuel stations (petrol pumps). The company reaches precious petroleum fuels to every nook and corner of the country through its network of over 50,000 customer touch points. Most of their pumps are fully automated for quality & quality assurance. The company also has countrywide marketing network is backed for supplies by 125 bulk storage terminals and depots and 91 LPG bottling plants, besides 116 aviation fuel stations and 13 lube blending plants.

Corporate Office of the company has directed all state offices –marketing division to offer total dealership development (TDM) programmes to their retail outlets (ROs). Accordingly, state office had identified a pioneer business school to conduct TDM programmes by indicating tentative topics like leadership / self-development, recruiting & monitoring workforce, customer relationship management activities, best sales practices, brand building and profitability improvement. Training Service Provider (TSP) – B-School has studied the entire supply chain of petrol selling business by visiting best petrol pumps and sick petrol pumps operations. The course contents were

developed and delivered both in in-house and outside considering the batch size of 30-40 dealers. At the end of programme both written and oral feedback from participants were obtained systematically.

Based on the experience gained and inputs received from the participants were considered for further improvement of the programme. About 460 plus dealers have participated and benefitted from TDM programme in 13 batches. All participants were issued participation certificates.

Summary of Petrol Pump Operations : Each day begins with the opening inventory of Motor Spirit (Petrol) and High Speed Diesel (HSD)-Diesel, indenting for inventory through online- mobile apps, checking for quality of petrol and diesel –testing before commencement of first sale, checking for dispensing unit / pump zero reading, attending customers requirement, maintaining stock register, entering the details of current rates, stock levels, replenishing the inventory, managing and supervising pump attendants, attending customers grievances / complaints, attending the customers' requirements such as maintaining toilets, water facilities, air facilities, marshalling the customers, avoiding waiting time in the queue closing sales and stock etc..

From the above, the following supply chain issues are identified as reported by the participants:

Table 1 Petrol Pump Supply Chain Operational Challenges

Sl.No	Supply Chain Process Components	Supply Chain Operational Challenges
1	Indenting and Replenishing of Inventory	Logistics issues-Transportation: Own transport or hire transport, waiting time in the terminal / depots, road congestion due to heavy traffic, strike/hartal, short supply of inventory, public holidays, evaporation loss, price increase effects etc
2	Unloading / Canting /De-canting	Filling the petrol / diesel in the storage tanks, maintaining the level, filling up of petrol / diesel in the respective storage tanks, de-canting of wrong fill up / mixing diesel/ petrol etc, de-canting as per the procedure stipulated by the oil company etc
3	Pump Operations	Auto reading/ zero reading, generation and printout of bills, working condition of dispensing units, calibration etc
4	Managing and supervising the workforce	People development, attendance, behaviour related issues, language issues (migrant labours), salary and overtime wages, minimum wages related issues, gender and cultural issues, economic conditions, educational level related issues, introducing people welfare measures, outbound activities/ outreach programmes etc
5	Customer Relationship Mgt. -Activities	Customer amenities such as water, air, rest rooms, cafeteria, allied services such as puncture /repair shops, customer data base, identification of key customers, devising relevant CRM activities, maintaining green environment etc
6	Brand building and best sales practices	Petrol Pump branding, selling fuel for customer value both tangible and non-tangible, offering freebies, discounted sales, credit sales, offering birth day/ wedding anniversary gifts etc

7	Sales enhancement and profitability improvement	Concentrating on energy boosters, identification of new customers, retention of existing customers, determine the break even sales, calculation of fixed costs and operational costs, increasing non-fuel revenue, installation of solar energy for lighting, pump power, managing demand and supply through inventory, calculation of profit / return on investment (ROI),
8	Fire & Safety Compliances	Up keeping of fire extinguishers, sand buckets, refilling and calibration etc, creating awareness on importance of fire & safety compliances etc.
9	(CSR) Activities	Be good to neighbours, adoption of villages individually or jointly for community development, participation in the CSR activities of the company. Up keeping of fire extinguishers, refilling and calibration etc, creating awareness on importance of fire & safety compliances etc.

Current scenario of petrol pumps

It is observed that most of the Company Owned & Company Operated (COCO) pumps, site A pumps have implemented most of the automation & digitization of pump operations, they are able to do better business in terms of sales i.e 20KL of MS and 8-10 KL of HSD on monthly basis. The pumps on highways are able to do even better sales and profits. Site B pumps and other pumps located in the rural areas are yet to implement the process automation and digitization through their company. The company has already invested heavily in ERP implementation, process automation and digitization initiatives.

Most of the ROs are not serious about knowing BEP sales, business results, ROI and Non-Fuel Selling revenue. Some of the pumps have already implemented green energy initiatives such as solar energy, windmill etc. Mobile technology, reward point system, credit card system, RXIL's TREDS Platform to facilitate MSME Vendor Payments, reward points etc are yet to be practiced..

Atleast one third of the pumps, they do not have rest rooms in their outlets, water facilities, air filling points, nitrogen gas points, auto bill generation facilities etc. They also have mentioned that they own multiple businesses/ family owned, so, their fuel stations are managed by the manager and staffs. Moreover, they do not know much on the CRM activities, CSR activities, data on their major / regular customers etc (no data base)

Emerging Trends

Private players like Reliance, Essar, Shell pumps are coming in big way in both urban and rural markets. Alternate sources of energy like solar, windmill, introduction of electric vehicles (EVs) in the market and implications on business of petrol pumps are not clear to the dealers. ROs are confined to their regular sales, commissions, incentives etc. They are yet to visualise the emerging trends in oil selling business.

Conclusion

It is seen that the petroleum supply chain more complex compared to manufacturing supply chain. The ROs are yet to leverage the technology component as part of their business. Few pumps are doing extremely well in terms of best sales practices, branding, CRM activities, managing their work force, increasing the foot falls, retention of customers, looking for new customers etc. Non-fuel selling revenue is one of the untapped area by most of the ROs. Compliance to minimum wage act, working conditions, stay, food, medical facilities are yet to be implemented completely. Players from private sector are going to bring lot of competition to these ROs appointed by the PSUs.

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3. Rusinga (2010). Value Chain Analysis along the Petroleum Supply Chain, A dissertation submitted in the Dept. of Accounting, University of Cape Town.

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FRAUDSTERS & DEFAULTERS BEWARE! TAX AUTHORITIES & INTELLIGENT SYSTEM WATCHING YOU

S N PANIGRAHI
GST CONSULTANT & CORPORATE TRAINER
sn.panigrahi1963@gmail.com

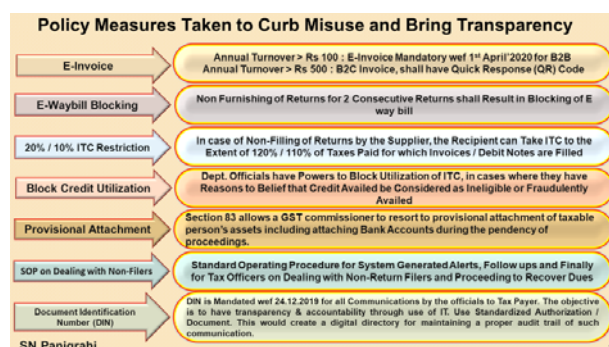
The government is increasingly looking to check evasion and plug revenue leakages as it's falling short of its tax collections estimated in the budget.

With searches carried out recently in different parts of the country, the directorate general of GST intelligence (DGGSTI) has unearthed cases of fake invoices worth over Rs 10,000 crore in the current fiscal. Scams like issuing fake GST invoices without actual supply of goods for availing of fraudulent input tax credit and also scams like creating fake companies and obtaining fake GST Registration with an aim to pass on Input Tax Credit, Circular Trading, Fraudulent Export & Inverted Tax Refunds etc have mainly come to light. Cases of mismatch over Rs 40 crore are now handed over to the DGGSTI which is a specialized investigation wing whose officers have all India jurisdiction. The rest of the cases will be taken up by the respective Commissionerate's.

The DGGSTI is now taking up the job to sensitize the income tax department and even banks about such cases. GST authorities started process of blocking input tax credit of about 1,000 taxpayers who have allegedly claimed more credit than they were eligible for.

The Central Board of Indirect Taxes and Customs has asked every Commissionerate to identify top 20 taxpayers who have the highest discrepancy in input tax credit based on the purchase-related GSTR-2A and summary GSTR-3B returns. GSTR 2A is automatically generated for each business on the GST portal, while taxpayers every month file GSTR-3B that also discloses the credit availed. Accordingly, actions are already initiated by all Commissionerate's to block the input credit for the top 20 taxpayers showing a mismatch between the two returns.

Some of the Policy Measures take in recent times as follows are expected to curb misuse and bring transparency.



E-Invoice : A system of directly issuing invoices through the GST-network (GSTN) is being worked out. With this, the sale and purchase invoices of a business having a turnover above a certain limit may have to be directly generated through the system. This will ensure easier matching of the purchases and sales of the opposite parties.

E-Waybill Blocking : The government has introduced an important change around the **e-way bill** generation with an aim to crack down on GST non-filers and evaders. With **effect from December 1st, 2019**, the blocking and unblocking of the e-way bill generation facility has been implemented on the e-way bill portal. E-way bill generation has been barred for taxpayers who haven't filed their returns for the **previous two consecutive periods**.

20% / 10% ITC Restriction : The government has capped the ITC that a registered person can claim, unless the entire eligible amount is backed by relevant invoices or debit notes. Sub-rule (4) to Rule 36 restricting input tax credit ("ITC") has been inserted with effect from 09.10.2019 vide **Notification No. 49/2019 – Central Tax dt. 09.10.2019**. Said sub-rule reads as under:

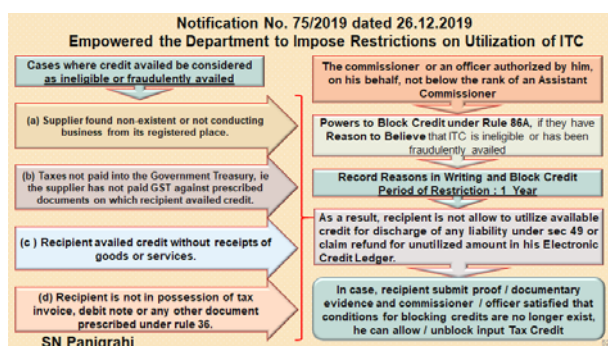
"(4) Input tax credit to be availed by a registered person in respect of invoices or debit notes, the details of which have not been uploaded by the suppliers under sub-section (1) of section 37, shall not exceed 20 per cent of the eligible credit available in respect of invoices or debit notes the details of which have been uploaded by the suppliers under sub-section (1) of section 37."

Circular No. 123/42/2019– GST; 11th November, 2019 has been issued to clarify the new provision. Further the 20% cap was reduced to 10% vide **Notification No. 75/2019 - CT dt.26.12.19** if invoices or debit notes are not reflected in GSTR-2A.

Powers of Officials to block credit under Rule 86A

Blocking Utilization of Tax Credits if credits are ineligible or fraudulently availed

Government vide **Notification No. 75/2019 dated 26.12.2019** inserted **Rule 86A** indicating conditions of use of amount available in Electronic Credit Ledger. Department officials now have authority to block the utilization of tax credits if the registered person has availed credit which are ineligible or fraudulently availed. The rationale of blocking the credit is clearly to plug cases of fake credits.



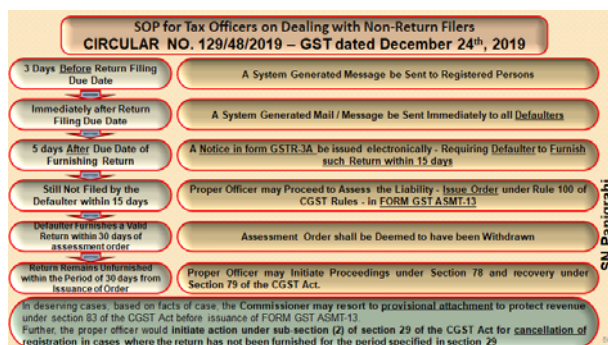
Provisional Attachment : Section 83 of CGST Act, allows a GST commissioner to resort to provisional attachment of taxable person's assets during the pendency of proceedings in instances like:

- Ø **Failure of a registered person to furnish periodic returns or obtaining registration under the GST Act despite falling within the prescribed registration thresholds.**
- Ø **Default in paying tax after cancellation of registration.**
- Ø **Suppression of transactions in supply of goods or services.**
- Ø **Fraudulent or excess availment of input tax credit with an intent to evade tax or gain undue advantage.**

Coercive steps like blocking input credit of taxpayers are being taken by the departmental officials on the pretext of valid reasons to suspect fraud or tax evasion, despite the Bombay High Court's judgment in case of Kaish Impex that has quashed the order to attach bank accounts, saying Attach Bank Accounts Sparingly.

- Ø **Under the CGST Act, a tax officer must frame an opinion before exercising powers of provisional attachment.**

SOP for Tax Officers on Dealing with Non-Return Filers
The tax officers 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 Central Goods and Services Tax Act, 2017. The CBIC vide **CIRCULAR NO. 129/48/2019 – GST dated December 24th, 2019** has provided the following guidelines as under to ensure uniformity in implementation of provisions of law across field formations.



Interception, Inspection, Verification and Detention of Goods in Transit

When the goods are in movement, a proper officer may intercept or inspect any vehicle that is carrying goods. A vehicle may be intercepted either for verification of documents or inspection of goods. He shall verify all the documents that the transporter is carrying including an E-way bill, invoice etc

Trade is Warned to be extra careful about Required Documents to Accompany Movement of Goods. Department Officials are very Vigilant these Days (Specially this being Last Quarter) to Recover Revenue Deficit.

Moreover, Traditional Business Habits (Like Month End Billings without Movement of Goods, Current E-Waybill with Corresponding Invoice of Very Old Date, Movement of Goods without Proper Documents, Multiple Trips of Goods Delivery with Same Documents etc... etc...) need to Change to become Compliant with Law, otherwise should be prepared to face severe consequences.

Generation and Quoting of Document Identification Number (DIN)

Use of CBIC-DIN was made compulsory from **24th Dec'2019** vide **Circular No. 122/41/2019- GST dated 05th November, 2019 & Circular No. 128/47/2019- GST dated 23rd December, 2019**, and no communication without bearing the DIN generated from the system will be valid.

Following are the cases for which the DIN has been mandated now:

- Ø search authorization,
- Ø summons,
- Ø arrest memo,
- Ø inspection notices and
- Ø letters issued in the course of any enquiry

by any officer of CBIC, to any tax payer or other person

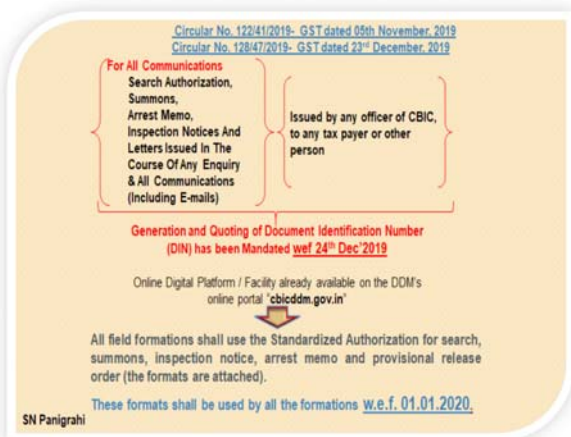
The objective is to have transparency and accountability in indirect tax administration through widespread use of information technology. This would create a digital directory for maintaining a proper audit trail of such communication. Further, it would also provide the recipients of such communication a digital facility to ascertain their genuineness.

The online digital platform / facility already available on the DDM's online portal "**cbicddm.gov.in**" for electronic generation of DIN has been suitably enhanced to enable electronic generation of DIN in respect of all forms of communication (including e-mails) sent to tax payers and other concerned persons

Harmonized and standardized the Formats : The Board also felt it necessary to harmonize and standardize the formats of search authorizations, summons, arrest memos, inspection notices etc. issued by the GST/ Central Excise / Service Tax formations across the

country.

The **standardized documents** have since been uploaded by DDM and are ready to be used. When downloaded and printed, these standardized documents would bear a pre-populated DIN thereon. Accordingly, the Board directs that all field formations shall use the standardized authorization for search, summons, inspection notice, arrest memo and provisional release order (the formats are attached). These formats shall be used by all the formations **w.e.f. 01.01.2020**



Constitution of Grievance Redressal Committees on GST related issues : GST Council in its 38th meeting held on 18.12.2019 has decided that a structured grievance redressal mechanism should be established for the taxpayers under GST to tackle grievances of taxpayers on GST related issues of specific/ general nature. GST Council has accordingly approved constitution of 'Grievance Redressal Committee' at Zonal / State level consisting of both Central Tax and State Tax officers, representatives of trade and industry and other GST stakeholders. Vide **F. No. 20/10/16/2018-GST (Pt. I)**; Dated 24th December, 2019, guidelines for Constitution of the Committee, Functions and Mandate of the Committee, Periodicity of Meeting of the Committee, Mechanism of Working of the Committee are circulated and accordingly committees are being formed.

AI, Data Analytics to Track GST Evaders, Boost Compliance : The government plans to increase the use of artificial intelligence and data analytics to track down tax evaders, and improve compliance with the Goods and Service Tax in order to augment revenue and to streamline the GST system and plug leakages due to fraud. Government notified various changes to GST rules to prevent frauds and fake invoicing, besides setting up grievance cells to ensure that genuine taxpayers are not harassed and the overall tax base increases.

Government is deliberating on a mechanism and machinery for disseminating inter-departmental data

among various agencies, including the GSTC, CBDT, CBIC, FIU, DoR, DGGI and State Tax Administrations, in order to achieve efficiency in curbing evasion and augment revenue collection.

Centre, States Frame Strategy to End GST Woes : The Centre and States have joined hands to formulate a nine-point strategy to streamline the Goods & Services Tax (GST) and plug revenue leakage. These include linking foreign exchange remittances with IGST refund for risky and new exporters, investigation of fraudulent ITC cases by the IT department, a single bank account for foreign remittance receipt, and refund disbursement, beside others.

It was also decided to constitute a Committee of Centre and State officers to examine and implement quick measures in a given time frame to curb fraudulent refund claims, including the inverted tax structure refund claims, and GST evasion. The Committee will come out with a detailed SoP (Standard Operating Procedure), which may be implemented across the country.

All major cases of fake Input Tax Credit, export/ import fraud and fraudulent refunds will also be compulsorily investigated by the investigation wing of the Income Tax Department.

Access to banking transactions, including bank account details by the GST system, in consultation with RBI and NPCI, was also explored. Aligning the GST system with the FIU (Financial Intelligence Unit) for the purpose of getting bank account details and transactions and PAN-based banking transactions, was also considered.

Sharing data of cases involving evasion, and fraudulent refund detected by CBIC with CBDT and vice-versa, so that fraudsters could be properly profiled was also taken up.

A self-assessment declaration will be prescribed with suitable amendments in GSTR Forms in case of closure of businesses. The Centre and states have agreed to undertake verification of unmatched Input Tax Credit availed by taxpayers.

And a lot many measures are being explored with the help of Advanced IT and Artificial Intelligence (AI).

Though these Restrictive and Corrective measures are being taken affect the Genuine Tax Payers, these are welcome to clean up the System and make the tax payers compliant with law.

So, Fraudsters and Defaulters Beware! Tax Authorities & Intelligent System Watching You

Disclaimer : The views and opinions; thoughts and assumptions; analysis and conclusions expressed in this article are those of the authors and do not necessarily reflect any legal standing.

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EVOLVING TECHNOLOGY & DIGITIZATION TRANSFORMING SUPPLY CHAIN

O.P. LONGIA
NATIONAL PRESIDENT (IIMM) 2015-17
omparkash.longia@yahoo.com

Meaning of Digitization: The process of converting the text, pictures, or sound into a digital format that can be processed by a computer, is digitization. In this format, information is organized into discrete units of data (called bits) that can be separately addressed (usually in multiple-bit groups called bytes). Audio and video digitization uses one of many analog-to-digital conversion processes in which a continuously variable (analog) signal is changed, without altering its essential content.

Digitization is the automation of existing manual and paper-based processes, enabled by the digitization of information; from an analog to a digital format. You'll notice that today digitization is indeed mainly used in a context of document capture and scanning, and in a context of digitizing business processes.

According to Business Dictionary, digitization is the conversion of analog information to digital form with suitable electronic devices so that information can be processed, stored, and transmitted through digital circuits, equipment, and networks.

Digitizing information makes it easier to preserve, access, and share. For example, an original historical document may only be accessible to people who visit its physical location, but if the document content is digitized, it can be made available to people worldwide. There is a growing trend towards digitization of historically and culturally significant data.

Difference between Digitization & Digitalization: While **Digitization** refers to the process of moving physical documents such as ledgers, purchase orders and records onto computer files, **digitalization** means integrating physical processes with digital data to create a fully optimized supply chain.

Need of Digitization in Supply Chain: Rising Customer expectations for quality products at best prices and the best service support in rising eCommerce have necessitated digitization in Supply Chain. Besides, the need for quick and accurate order fulfilment has driven the move towards supply chain optimization.

The evolving technology in various fields and innovative concept such as Supply Chain 4.0 have generated the feel of the application of the **Internet of Things**, the

use of **advanced robotics**, and the application of **advanced analytics of big data** in **supply chain management**: place **sensors in everything**, create **networks everywhere**, **automate anything**, and **analyse everything** to significantly improve performance and customer satisfaction.

During the last three decades, logistics 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.

In addition to this, the present increased globalized complexity of modern supply chain, the Supply chain has become a complex function and does not confine to one country. Relative cost considerations mean that suppliers, distributors and customers are often part of a long, complex, multi-national supply chain that is under diverse control.

The Process for Supply Chain Digitalization: There is a process by which distributors can make the move towards supply chain digitalization. To begin, they need to gauge peaks and troughs in demand, and existing ERP/SRM software is sufficient to produce this data by tracking the movement of goods through the warehouse system.

Another part of this process involves using this data to optimize both the warehouse operation and logistics. In order to achieve this, businesses need to move beyond SRM and ERP. They need specialist warehouse optimization software that automates order planning against real-time stock level data to allow order planning to be digitally linked to predictive analytics. This will ensure a high percentage of order fulfilment without overstocking.

Organizations leverage digitization to adjust products in the supply chain based upon demand for those products using real-time sales information, allowing them to accelerate production of best-sellers and cut their losses on the laggards.

How digitization is transforming Logistics and Supply Chain: In view of the present economic growth trend in the country, India is on a fast track to development, powered by innovation and disruption across key

sectors, encouraging government policies, and robust and aggressive growth in IT. Globally, as in India, the logistics sector is undergoing an unprecedented transformation, fuelled by innovations in IT and digitization. Despite this, the Indian logistics sector, regarded as the backbone of a healthy economy, is highly fragmented and unorganised. As a result, the logistics spend in India currently amounts to 14-15 percent of GDP compared to the 5-6 percent of the GDP spend in developed economies. However, with focused initiatives on manufacturing, like the Make in India campaign, and thrust on digitisation with the Digital India campaign, the Indian logistics sector has slowly begun its disruptive transformation.

According to a study by The Associated Chambers of Commerce and Industry of India (ASSOCHAM), the logistics market in India is expected to grow to USD 307 billion by the year 2020. Some key areas where digitisation will play a major role in transforming logistics into a robust, IT-enabled, intelligent service. This include:

Artificial Intelligence / Machine Learning and Data Analytics: Globally, logistics and supply chains are undergoing a transformation as more “**artificial intelligence**” is being employed to manage both domestic and international movement of goods. Some key applications of AI include:

- Reduction in human intervention and workforce and increased efficiency in delivery and warehousing (including sorting and distribution centres).
- The efficient and intelligent harnessing of big data to drive cost-effective supply chain management.

Analysis of real authentic data has enabled digitisation for logistics sector and has helped create a massive transformation in not just managing client expectations but also to increase efficiency, cut costs, and drive growth. Some key areas where data analytics is helping shape logistics include:

- Improved operational efficiency due to data-enabled intelligence that enables effective decision making;
- Efficient management and tracking of inventory due to real-time data updates, created through a data bank on routes and progression reports;
- Improved customer experience due to optimised, timely, and effective execution and forecasting of logistics needs of clients.

Internet of Things (IoT): When environmental things start identifying themselves is called Internet of Things (IoT). Internet of things can be explained as the ability for multiple physical objects to connect to the internet and share data, without human intervention. This has

effectively transformed several businesses, including logistics. Many logistics experts are already using these new resources to improve systems and supply networks, reduce costs, and look for opportunities to generate more revenue too. Listed below are some practical applications of IoT in logistics:

- Safety in supply chain management by reducing human interactions and risk of accidents.
- Implementation of sustainable processes through optimisation of resources, including energy consumption.
- Seamless and end-to-end visibility of supply chain through digitally connected devices.
- Effective and optimised warehousing and yard management by reducing human intervention and enabling more machine-to-machine interaction.
- Effective fleet management through digitally connected devices that can assist in tracking maintenance schedules, vehicle usage, and service routes, and cut fleet downtime.

Blockchain: Blockchain technology is most simply defined as a decentralized, distributed ledger that records the provenance of a digital asset. It is a distributed database that maintains an ever-growing list of records called ‘blocks’, transfers information with a timestamp that is locked and cannot be altered. Modern logistics networks today cater to the expanding global markets, resulting in supply chains that span over hundreds of stages over months and multiple geographical (international) locations, including tonnes of shipping and customs paperwork and multi-level payments involving numerous stakeholders. Hence, logistics is an ideal sector where blockchain can be applied to:

- Improve supply chain security and reduce fraud since all data is maintained on a public ledger.
- Facilitate seamless processes by reducing bottlenecks as there is no longer a requirement for certification by third parties
- Enhanced supply chain security and accuracy as hardcopy documents are replaced with digital copies.
- Accurate recording of data and real-time tracking updates.

To conclude, in end we can say that technological development across the globe is changing the roles of the humans in all sector – same is in SCM too.

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DATA VISUALIZATION AND PERFORMANCE IN SUPPLY CHAIN

P.VISWANATHAN, N.C. MEMBER OF IIMM BANGALORE BRANCH

vid_shy@yahoo.com

In supply chain visualization converts the amount of data available, through multiple supply chain solutions that can be easily read, displayed, so as to enable to supply chain planner's use, and find the strength in supply channel works, for a faster decision, making which can help the day to day function in supply chain.

Supply chain visualization enables users to see information easily, even if data comes from multiple systems (different systems). In supply chain visualization is able to predict materials on order, also cover the additional demand, later orders of customers, as a result of delayed deliveries, or change in sales order priorities. In supply chain Enterprise Resources Planning, a traditional system, method in case unless the order is executed late, it becomes difficult to get information on the systems. If the organization uses the multiple systems of data visualization, for various aspects in supply chain, it becomes difficult to consider which orders are late, deliveries become late from suppliers.

In supply chain it is difficult if sales orders, might affect if customers need to rush with the order placed with existing orders, especially if products that use common components, sub-assemblies in supply chain, data visualization condones the affect in supply chain. In supply chain accuracy, fast, easy to manage information, supply chain will be able to visualize, notify the customers with orders which will be late, and delivery delayed with expected date of delivery, and this will be appreciated by customers. In supply chain sourcing has become an inevitable today in a global economy, and it can be complicated, as buyers are to consider price quality, on-time delivery, performance, also to consider the period of logistic time, cost when deciding the right supplier for the order. Supply chain visualization consolidates data from supplier performance, records, logistic information, contracts, request for quote, open date, purchase orders, present information, and simplifies the decision on the right supplier for preparing purchase order.

In supply chain with organization with multiple suppliers, it has become necessary to evaluate supplier performance, cost of delivery of materials to the point of use for an organization with multiple facilities. In supply chain visualization helps the buyer to make right choice for the organization with all the schedules. Supply chain management starts from the bottom level, sourcing, raw material needed for production, then delivery to end consumer, and this covers the movement of product. As supply chain manages the process have to be carefully managed, and carefully monitored, the entire flow of material, devices a

strategy to bring visualization, to help efficient and productivity in the process in supply chain.

In supply chain the process has in its purview the data visualization of segments, like sourcing, demand planning, inventory management, logistics, and it is to better the methods of procedure of the outdated system of sourcing, and then distribute to the end of the consumer.

In supply chain organization collect data and make it an action, able through visualization data, tools, recover unnecessary waste, throughout the supply chain, it can also help supply chain organization, through merger and acquisition of business opportunities to present a conciliation in data (is a technology that uses process information & mathematics) main the visualization of supply chain. In supply chain organization keeping flow of suppliers, transporters, warehouses, factories, customers on a steady flow, require constant data to be fed, communicate and a proper visualization, digitalization in supply chain.

In supply chain the smallest distribution can create an effect that exists in the vulnerability of supply chain. Data visualization is the main component that can synthesis each data points, and merges them into a form of change into digitalization in supply chain. In supply chain key performance indicators are the back bone of business intelligence, and are the strongest indicator to know whether the business is successful, monitoring, business successful, and is monitored to the fullest extent in supply chain. Data visualization improves performance, monitoring, improving performances, and digitalization, saves capital investment, and improves logistic concepts in supply chain, in every step movement with variable devices in supply chain.

Data visualization bridges the gap between information available, use of information, used information, updated, reported with valuable data in a supply, and it is important to integrate data which is able to understand easily with digitalization in supply chain. Decisions makers in supply chain are finding ways to effectively manage data operations. Data in supply chain operations demonstrate the abundance of process, improvement opportunities available by data visualization and digitalization in supply chain.

Data visualization that supply chain that integrates business planning, helping organization to be more responsive in supply chain as they understand the market trends, customer preference in supply chain. The internet of things, machine learning, is being used in predictive analysis to avoid any unplanned

downtime, in supply chain. Internet of things can provide real-time, data to bring out the product process. Machine learning algorithms are to analyze data which can analyze, predict, any failure in data visualization in manufacturing in supply chain, data will help in analyzing Global Position System, which has a visualization to traffic, weather data, which dynamically plan, and optimize delivery routes in supply chain. In supply chain investigation of the power of data, to become more agile, responsive, demand driven, visualization of customer oriented in supply chain with risk in management, resilience (the capacity to recover) a practice which will benefit the data to deliver more effective needs with digitalization in supply chain.

In supply chain keeping flow of suppliers, transporters, warehouses, factories, customers, require constant data communication, visualization in supply chain, even as the disruption process in supply chain can have the effect, therefore the existence becomes a potential vulnerability (state of being possibly attacked) in supply chain. Data visualization is the main objective of every data, and they merge into single entity in every supply chain, where challenges are shared with the relevant organization, to establish plans on account of last minute changes in supply chain.

In supply chain the current focus is on digitalization of transforming supply chain management, improving efficiency, of the supply chain, by giving importance to the organization. In supply chain operating opening with tough profit margin, without improvement, having substantial impact by data visualization becomes inefficient in supply chain. Digital analytics in machine learning can be beneficial to supply chain management, when within demand forecasting, data visualization, and warehouse optimization with the amount of data collected by industrial logistic, transportation, warehouse, and is able to harness (control and make use)the data to drive operational performance correctly in supply chain.

In supply chain time series (predict future value based on previously based value, used in stock values) forecasting is an important area in machine learning, thus data visualization has many prediction problems, problems, that move time component,(measurement used to sequence) which adds additional information, and make series of problem more difficult to handle as compared to many of the prediction in supply chain.

In supply chain the key factors influencing inventory levels, supplier quality, demand forecasting, procure-to-pay, order to cash, production planning, transportation management, are becoming part of data visualization, and digitalization in supply chain, with new knowledge insights, being a revolution in supply chain. In supply chain reducing freight cost, improving supplier delivery performance, minimizing supplier risk, that benefit from machine learning, internet of things, artificial intelligence, providing a collaborative supply chain, data visualizing and bringing in digitalization is creating a concrete effect in supply chain.

In supply chain improving supplier quality management, finding supplier quality levels, creating a trace-and track data visualization, digitalizing, each

supplier for quality, compliance, is essential in a regulated organization in supply chain. In supply chain providing a learning with advanced analytics, internet of things, sensors, real-time inventory, providing end-to-end visibility across supply chain, bringing in data visualization, and digitalizing in supply chain.

In supply chain to develop an accurate agile (able to move quickly) data visualization digitalize application to display downstream supply chain, and inventory information in supply chain, implement an innovative application to help to improve: 1. Enhancing the ability to identify, the trends, so as to reduce errors, excess inventory, distribution, disruption. 2. Accelerate the data visualization for faster, more informed decision, making throughout the supply chain. 3. Assessing the required of inventory, likely demand, across the supply chain, location of segment in supply chain.

Traditional data visualization have been with pie-charts, graphs, which are designed to highlight the simple quantitative relationship in supply chain, while traditional business graph, charts, need interactive search, and sort the supply chain, with the introduction of product in supply chain. In the advanced supply chain data visualization makes it possible to uncover the relationship between the big data set up in supply chain, as the typical end-to-end supply chain includes connecting with vendors, manufacturing distributors, and customers making such network complex, on the technique developed to the millions of users across the global network in supply chain.

Data visualization, digitalization enables organization in supply chain to get more value from the data, and perform, better in a competitive supply chain. Data analytics predict new revenue system, anticipate product trends, popularity, improve customer retention rates, optimize investment decisions, backed by analytic derived facts in supply chain. Data visualization helps to measure, manage, bring in digitalization analyze supply chain performances, to maximize effectiveness, optimize returns on investment. Data analytics also help to profound customer insights, (to gain a deeper understanding), which can be further utilized in supply chain, business decisions, data visualization can bring in performance insights products, innovation, share market insights in supply chain.

Data visualization, digitalization should reflect genuine data analysis, in order to increase quality of report in supply chain, and every stage is considered an important, with details like charts, graphs, pie-graphs, which cannot be neglected, and the best products should be optimized in supply chain. Data base visualization in reducing supply chain costs has been the focus of any organization, and it is equally important to innovate continually, maintain supply chain stability. The concept in supply chain requires data visualization, digitalization, information technology to serve both the growth of the organization, operation, which can help supply chain in any disruptions in a competitive supply chain, at the same time present a strong reliability to keep business improve in supply chain.

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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.

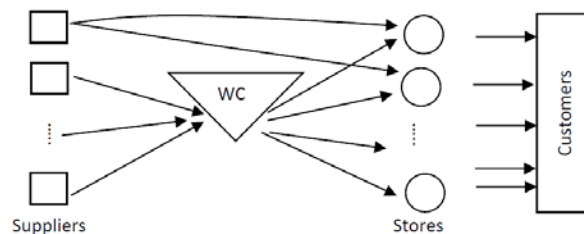


Figure 1. Supply chain configuration

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.

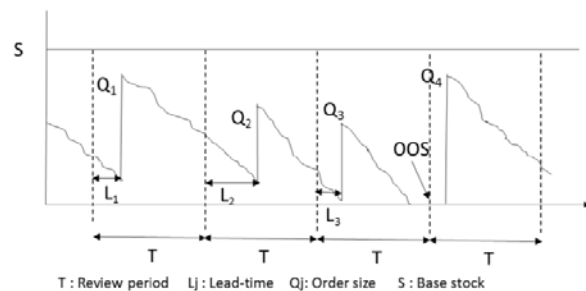


Figure 2. Replenishment policy

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 α , is an event-based measurement, which describes the proportion of cycles in which no stock out occurs. Type-2 service level, denoted by $\hat{\alpha}$, 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. $\hat{\alpha}$ service level is typically considered a more relevant measure of service level compared to α . 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 T_j , the order quantity Q_j and the lead-time L_j are decided in order to minimize the OOS risk at the WC that may occur during the cycle period. L_j is estimated based on the inventory (I_j) to avoid OOS during the supply lead-time. If the lead-time (L) exceeds L_j , the order Q_j 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.

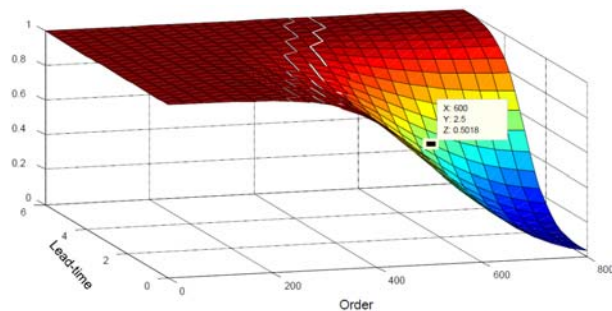


Figure 4. SFR prediction using an analytic approach

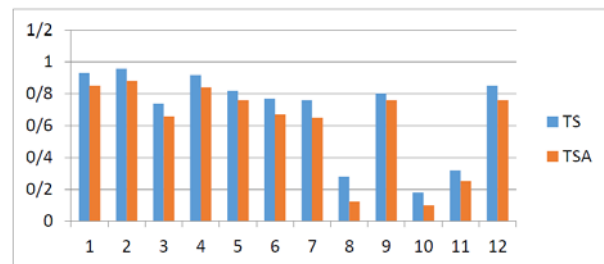


Figure 5. SSL estimation: Analytic approach

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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NEW SUPPLY CHAIN TECHNOLOGIES - PARADIGM SHIFTS TO SHAPE FUTURE SUPPLY CHAINS

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

INTRODUCTION: Indian Software industry growth is like “Startup for Digitization”. In the last 4 decades, India gained immense respect among the world community, with multiple growth in software industry. Further, India is at the threshold of a new beginning with CHANGE.

As already assessed by many in network collaborative discussions and in research articles, the World, in 2050 will be a place of total new SCM technologies, specially through Robotics and advance materials.

As we see in advance, seemingly impossible feats of Indians have captured the imagination of the world - thus making to think to transform - from Innovation to Indovation (**Indian Innovation**).

However Global Innovation index is moving bit downwards for India, a worrisome issue and to reverse this trend sometime back, National Innovation Foundation, spelt out a “way forward agenda” which includes:

- To move from the penchant of doing “First to India” to “First to World”.
- To make India a leading “Start up” Nation
- To move our innovations from *jugaad* (less from less) to achievable excellence (more from less).
- To increase R & D spending by Govt. and Industry in the ratio of 80:20 in place of current ratio of 20:80.
- To bring out Govt. policy innovation to support Technology Innovation (Technovation).

To move forward in the century and to establish, these big shifts are required and to remain there.

2. Under the above background, for easy understanding, some of the experts have grouped the new SCM technologies into 3 areas:

- Digitizing work and life
- Smart physical systems
- Energy technologies

3. From the early assembly lines to cutting-edge Robotic systems, the continuously evolving supply chain technologies is going to shape the future. Most recent trends in supply chain technologies focus on smart, tech-driven solution to decrease operating costs and improve efficiency, though there may be unforeseen changes, still these new supply chain technologies would drive innovation over the coming years.

4. NEW AND UPCOMING SUPPLY CHAIN TECHNOLOGIES:

Several elements emerge while foreseeing future of Supply Chain in comparison to existing. One vital concept in Supply Chain is the certainty and reliability of data. New Supply Chain Technologies look to, accelerated improved business connectivity, visibility, and certainty of supply chain data, in addition to information flow. So many, many Supply Chain Technologies have emerged / are emerging to shape the “future of SCM”. The list includes:

- 4.1. Artificial Intelligence
- 4.2. Automated Material Handling Systems coupled with Bar-coding/ Automatic Identification
- 4.3. Cloud Computing
- 4.4. Computer Aided: Design, Engineering & Process Planning
- 4.5. Computer Network & Graphics
- 4.6. Databases - Big data
- 4.7. Embedded Systems
- 4.8. Environmental Control Systems
- 4.9. Flexible Manufacturing Systems
- 4.10. Internet of Things
- 4.11. Machine Learning
- 4.12. Material Requirement Planning & Manufacturing Resources Planning
- 4.13. Real-Time Process Control Systems
- 4.14. Robotics
- 4.15. Sensor Networks & Wireless Communication
- 4.16. 3D Printing
- 4.17. Block Chain

All above technologies are comprehensively briefed hereunder:

4.1. Artificial Intelligence: Advanced computing with Artificial Intelligence help to perform human-like tasks covering training. Integration of Artificial Intelligence into supply chain like Voice recognition would help to overcome several regulatory obstacles.

So Artificial Intelligence is the future of supply chain, driven by endless collaboration and seamless information flow to do wonders in the procurement domain.

4.2. Automated Material Handling Systems coupled with Bar-coding / Automatic Identification: Automated Material Handling Systems is the control, protection, movement, storage of products and materials through consumption, distribution, disposal, manufacturing, and warehousing. The process of Automated Material Handling Systems integrates different automated,

manual, semi-automated equipment, and systems to support the supply chain process.

To infer, Automated Material Handling Systems and processes are the future of improving customer service, lessening delivery time, and reducing inventory, reducing overall handling costs in distribution, manufacturing, and transportation.

Therefore in supply chain operations, the introduction of Bar-coding/Automatic identification signifies a major break to improve and repair inventory management, process control, and tracing/tracking systems.

4.3. Cloud Computing: For innovative software adoption more quickly, the use of Cloud computing serves as tool driving supply chain processes with reduced upgrade impact. With Cloud computing, Total Cost of Ownership and Timing would also experience improvements.

Hence, Cloud computing in future enables easy integration and connectivity besides path migration for multiple functionality.

4.4. Computer Aided: Design, Engineering & Process Planning: The idea of Computer Aided Design (CAD) is to plan the manufacturing process of every element which contain manufacturing and assembly of parts. In addition CAD ideas include making measurements, packaging and dispatch of finished goods. The complete CAD process includes a Data Base and Expert Systems, which permit all functional areas of computer-aided production in cooperation with an expert knowledge base, operating together.

Similarly Computer Aided Engineering (CAE) takes care of the process involved in using computer workstation for generating engineering specifications. Future use of CAE involves utilizing data from manufacturing processes and material supply to make better engineering in manufacturing and assembly planning.

Likewise Computer Aided Process Planning (CAPP) connects design and manufacturing in computer-integrated manufacturing environ. CAPP show the way to develop manufacturing plan, built on identified variables viz. Cost, Machine Availability, Lead Times, Material Substitution Routings, Production Volumes, and Testing Requirements.

4.5. Computer Network & Graphics: In general the logistics of Supply chain involves various economic activities. The link between logistics and industrial operations in the supply chain provides a thought to implement. The reasonable system in the future will implement a modern computer network, capable of satisfying the customer and organizational supply chain needs.

Embedded with above, a commonly in use potential technology, even in supply chain is Computer Graphics as a support tool for a decision making system and task scheduling.

So, these supply chain technologies would provide intelligent route optimization which will effectively save time in logistics handling and supply chain scheduling.

4.6. Databases - Big data: Big database with less than 30% estimated usage of data collected, applying analytics and data science would see a new future for database relating to supply chain technologies.

Incorporation of more database, and leveraging into the supply chain, results better predictability accuracy.

Further “Big Data” is a contemporary buzzword, having significant implications supply chain.

Three Vs, make big data very unique by:

Velocity (in real time),

Variety (the data varies in time and in context, and is not a fixed data model to real time),

Volume (the volumes are significant and require unique approaches).

4.7. Embedded Systems: Embedded systems will make use of Information and Communications Technologies and management strategies to provide integrated and intelligent systems in Supply Chain and Logistics thus creating value through reactions in intelligent ways.

Embedded systems are there to develop a responsive system for solving different supply chain problems and benefits procurement & network arrangement to facilitate a link between buyers and suppliers, resulting in reduced transaction and cycle times, reduced costs, etc.

4.8. Environmental Control Systems: For achieving workable supply chain strategy, the key is Environmental control systems, which cover the management of all ecological impacts from supply chain through the products life-cycles and services.

Environmental Control Systems is going to project great importance in the future of checking environmental enhancements within the supply chain.

4.9. Flexible Manufacturing Systems: This is a process for creating products that are adjustable to changes in the manufacturing process, both in type and quantity. Computerized and Machines systems are organized for making various parts and handling various production levels.

The above system gives businesses a benefit to alter manufacturing environ rapidly and increase process efficiency.

4.10. Internet-Of-Things: Internet of Things (IoT) is already a force for speedy growth in an increasingly digital global economy. The IoT will boost productivity, and encourage innovation.

The Internet of Things is driven by an expansion of Internet through the inclusion of physical objects combined with an ability to provide smarter services to the environment as more data becomes available.

Various domains ranging from Green-IT and energy efficiency to logistics are already getting benefit from the Internet of Things concept. Of course there are challenges also, associated with the Internet of Things, notably in areas of trust, security, standardization and

governance, required to ensure a fair and trustworthy open Internet of Things which provides value to society/ industry.

4.11. Machine Learning: Machine learning offers learning capability without being programmed. Using Machine learning in the supply chain, teach to evolve and quickly change when exposed to new instructions / Programs.

4.12. Material Requirement Planning & Manufacturing Resources Planning: Material Requirement Planning (MRP) has been the most widely implemented large-scale production management system with most of the ERP systems in some shape or the other. MRP provides planning and control system for production, scheduling, and inventory. The MRP uses forecasting or actual orders to decide client demand for goods with a system of push type inventory control.

Next, Material Resources Planning will be an extension of the features of the MRP system to support various manufacturing functions over and above materials planning, inventory control, and Bill of Materials control.

4.13. Real-Time Process Control Systems: Real-Time Process Control Systems increases focus on supply chain optimization and significantly increase the task reputation.

The main features of future planning and control are predictable to be made automated and intelligent control using Real-Time Process Control Systems.

4.14. Robotics: Every machinery process looks to Robotics for automation. Supply chain technologies applying Robotics would, in the future, become self-operating machines. Soon Robotics would enable machines to become more suitable for automation.

As on date, the surveys say Robotics is underutilized in warehousing and one should use more of these 3Ps i.e. Picking, Packing and Packaging.

4.15. Sensor Networks & Wireless Communication: To eliminate manual steps from supply chain process the need is sensors networks at each stage of a production process. Such Supply chain technologies, like the addition of Stock Keeping Unit - level visibility, has drastically reduced shortages and would provide further benefits in times to come.

With the right infrastructure, Sensors Networks with memory capacity and processing speeds would store and make use of data for smarter processing.

Supply chain technologies have been vital for enhancing product distribution. With the recent increase in Wireless Communication, automation is booming. The use of Wireless Communication would provide a smart supply chain management system for monitoring goods in the future. Wireless Communication is set to become beneficial in the supply chain with a practical application of systems, like GPS and RFID, in product monitoring and safety of goods.

4.16. 3D Printing: 3D printing is powerful and surprisingly versatile innovation.

3D Printing has been around for long time and generally using additive manufacturing, however, commercialization at mass level still has to take off. It involves fabrication of products through the use of printers which either place layer upon layer of materials lasers to burn material, resulting in a finished design.

As on date, 3D Printing is used within several industries for making medical implants, jewelry, racing-car parts, solid state batteries, customized mobile phones etc.

The notable benefits of 3D Printing technology for Supply Chain include:

Reduction in Lead time, increase “on time” supply performance, reduction of space requirement in warehouses, faster prototyping, greater customization etc.

4.17. Block chain: Block chain is the most searched technology term Big Data Vs IoT.

As known, in any supply chain transaction, from manufacturer to buyer there are multiple copies of transactions, logistics documents, purchase orders, transportation invoices, inventory receipts, transfers and so on, which is must and create errors in the process. Blockchain in nutshell helps all of the players in an industry to store and share among parties in one place.

The ledger system with different attributes is, of course, what is known as blockchain”.

5. CONCLUSION

To introduce all these Supply Chain Technologies, businesses are already following the best processes suitable to their operation while extending collaboration and importance across their supply chain. Data is essential with a seamless connection in making better decisions and improving overall performance.

These supply chain technologies enable a total re-engineering of the supply chain, by eliminating constraints / limits.

The vision of Supply Chain Technologies which are shaping “existing and future of Supply Chain”, is to create a seamless end-to-end supply chain, with appreciable execution and planning at every level, starting with more product innovation and client-centric necessities to the supply chain process down to consumer satisfaction which is the end result.

To conclude an emerging paradigm shifts in SCM is allowing companies to become truly demand driven, to achieve their planned service levels at lower cost from up to half the average stock with no requirement for highly accurate forecast. Added to this, the prevalence of internet based and other new technologies have already created high transparency standards and made end to end Supply Chain Visibility, a Reality.

Ref: (Internet / Networking seminars / Networking Discussions)

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CHANGING DYNAMICS OF SUPPLY CHAIN

Managers need to understand demand forecasting and use the right technology to clock in demand, not to forget exports

Supply chains need to be dynamic and agile enough to respond quickly to the varying demand needs. It is important to have a sourcing strategy that is predictable in terms of producing, transportation, warehousing and distribution. Secondly, supply chain visibility is available today rich set of technologies such as IoT, barcodes, RFIDs, and data analytics. Thirdly, superior intelligence churned out through AI and machine learning techniques augment abilities to make decisions.

Effective SCM is key to business and it is important that the right tools or programmes are in place to ensure the availability of products at the right place and the right time.



Rajesh Jaggi.

Rajesh Jaggi, managing partner, real estate, Everstone Group, says, “Companies aim to have lesser inventory in order to increase flexibility, reduce logistics cost and have quick turnaround between manufacturing units, distribution and customers. Our FEBI (Faster, Economical, Better and Innovative) approach helps in providing optimised solutions to customers.

IndoSpace, being the largest, most modern and the only national network of industrial real estate in India, provides clients with light manufacturing units and distribution centres across industrial zones, in proximity to their customers which makes a difference in delivering within time along with the flexibility of maintaining inventory.”



Aditya Vazirani.

“We have developed our in-house WMS which works on similar principles of Six Sigma possible for gatekeeping checks – even though it lengthens the process in the warehouse; it ensures that the product is correct at the time of dispatch and on time. We are working with a company to implement IoT in warehouses for error checking through security systems,” says Aditya Vazirani, CEO, Robinsons Global Logistics Solutions.

In the era of digitalisation, getting the right product at the right place and the right time is key for differentiating the end customer experience. “We offer a product serialisation solution to the brand with large supply chain networks to give a digital identity to each product with the help of IoT. Each uniquely labelled product is supported by a database containing all related data, from product images to product composition, including quality and sourcing information. All product related information is tracked against the unique ID, from the moment the product rolls off an assembly line, across its supply chain and till it reaches the end consumer. This allows each manufacturer to track the products across the supply chain in real time,” says Divay Kumar, CEO & Founder, O4S.



Divay Kumar.

Efficiency issues : Strategic sourcing is key in the procurement process of high value raw materials, fuel and chemicals, packaging as well as engineering spares and services. Chetan Walunj, co-founder, Repos Energy, adds, “Several industries take into account all the different important aspects of SCM while strategising but leave out some of the most important aspects such as the impact of such a system on the end customers or the vendors and other contributors. We make sure that we don’t oversee the purpose of our product and its value for our customers. We make our SCM effective for all our stakeholders and are mindful of the fact that quality begets best results. So each Repos Petrol Pump at our industry is handcrafted by our team-members for best quality products. Regular training is conducted including for skilled and non-skilled labour.”



Chetan Walunj.

Process excellence : For efficient SCM, the organisational culture needs to promote excellence in various processes, so they can work in cohesion. “We conduct toolbox meetings every Saturday in each of our 36 warehouses to keep a continuous training procedure happening which is documented. Process re-engineering and adoption of new streamlined processes is the goal for 2019-2020 to drive further efficiencies, but as always, resistance to change an existing mindset is the biggest factor. When you explain how the new process is beneficial and is driven by a team leader on the ground and not the management the change is quite marvelous,” says Vazirani.

A strong culture of collaboration and coordination is one of the key imperatives in achieving an efficient SCM. People, Process and Technology act as the key enablers when they work in orchestration. “The planning exercise should broadly encompass all key functions of strategy, sales, finance, procurement, production and distribution. The execution should be driven by the agreed processes that cut across these functions enabling quicker responses and decisions. Technology suites such as ERP, forecasting, advanced analytics, digital technologies should be leveraged to bind these functions and provide for efficient workflows. The challenges to achieve this sweet spot would be the inherent silo tendencies of each function having goals that sometimes are in conflict with that of other functions, which can clearly overshadow the overarching objectives of an efficient SCM,” avers Anjan Kumar, VP, sales (APAC, EU) business unit head, engineering solutions, automotive and industrial products, AXISCADES.

Cost control : In today’s competitive markets where brands are forced to limit pricing to stay relevant to the price-sensitive consumers, the only way to grow profitability is by controlling operating costs and minimising losses.



Jatinder Gujral.

While most companies have been successful in controlling on premise operations costs related to

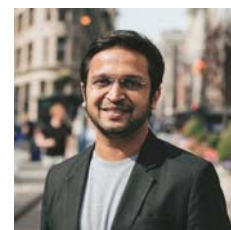
manufacturing, sourcing (to a certain extent), overheads due to plant automation, the same cannot be said for distribution supply-chain as it lies outside the brand’s controlled environment. Jatinder Gujral, CEO, Setco Automotive explains, “The most critical parameter here is to not let inefficiency kick in. We have broken the chain down into its essential elements to make our SCM work more efficiently. And have continuously endeavoured to establish a practice that addresses the ergonomic issues that concern the shop floor. Having said that, we also look into planned maintenance, continuous training and ensure zero wastage of variable costs.”



RS Jalan.

RS Jalan, MD, GHCL adds, “We have a monthly operational review process to fine tune our procurement planning and inventory planning in view of changing market conditions as well our production requirements. The cross functional involvement of marketing, SCM and production teams ascertains the continuous reduction in operating cost. Additionally, we have clearly defined Key Performance Indicators (KPIs) with the aim to bring continuous improvement in each process thus leading to reduction in operating cost.”

Trend check : There have been positive developments in recent pasts in the area of supply chain management like GST implementation, increasing axle load in trucks and promotion coastal shipping. Nishith Rastogi, CEO & co-founder, Locus opines, “The rise of mobiles has resulted in a drastic increase in the tracking of goods. Another trend that we see is the rise of the sharing economy even in the shipping world. Many players are using services to ship goods together and save costs. Going ahead, we will see services like Virtual Transportation Network (internal transport platform), Cross-docking (unloading materials from an incoming vehicle loading these materials directly into outbound trucks) and 3D packing (technology to use the maximum space inside a vehicle) becoming more popular amongst established players. Companies who become early adopters of these technologies for supply chain management would stay ahead in the innovation and optimisation game.”



Nishith Rastogi.

Risk factor : The presence of a robust and well planned logistics infrastructure, effective logistics management system enables seamless movement of goods from the point of origin to that of consumption, and boosts economy. From a client perspective, the option of flexibility and customisation in growing the space as per their business needs translates into being value for money.

Jaggi says, "Grade A warehouses are infrastructurally more equipped than the other types due to efficient material handling, enormous amount of space along with access to latest technology. They have ample clear heights, optimised column spacing, flat and super-flat floors designed to support high cube racking, high dock-door ratios and extensive concrete truck courts. These warehouses allow abundant creativity in laying out the plant & equipment and they also provide for easier movement within the buildings resulting in optimized turn-around time and lower logistics cost."



Aditya Virwani.

"The most critical challenge for us to cater to supply chain companies is the positioning of the logistic parks. To acquire the right piece of land with the right connectivity and scope for development within the right price is highly crucial for us. It is essential to making land acquisition rules consistent across states, thereby reducing entry barriers and mutation implications on cost and time. If all this is handled, robust logistics infrastructure can bridge the gap between tier 1, 2 & 3 cities and rural areas and the businesses can perform better and grow," says Aditya Virwani, COO, Embassy Group.

Sekaran Letchumanan, VP, operations, Flex India, avers, "Our social and environmental trainings align with responsible business alliance (RBA) requirements and supplier requirements. At Flex, our efforts have been able to reduce movement times by 11.7 days a year on average and they have also allowed us to activate contingency plans when natural disasters and disruptions such as the Tianjin port explosion or Kumamoto earthquake happen."



Sekaran Letchumanan.

The company has a centralised GPSC vertical spearheaded through the Global Business Services organisation which helps real time management.

For example, Flex managed Tianjin port explosion through a war room at GBS- a classic example of using Flex Pulse which provided real time insights into its supply chain, helping them to act swiftly and mitigated the risk arising out of the crisis.

Auto slowdown : The impact of slowdown in the auto sector will last at least for the next 18 months and OEM and OES customers are finding ways of downsizing and yet maintaining customer service levels. Slowdown in the auto sector has its clear effects on the OEMs and their supplier network.

The immediate effect is piling up inventory that puts pressure on pricing, underutilisation of capacity, loss of jobs.

Shared mobility is not helping growth in auto sector. The long term impact due to revenue pressure is cutting of R&D spend affecting future product launches and innovation within auto sector.

Further slowdown can spill over to other adjacent sectors thus hurting macro economy, if not contained soon enough. Shared mobility is not helping growth in auto sector. The long term impact due to revenue pressure is cutting of R&D spend affecting future product launches and innovation within auto sector.

Further slowdown can spill over to other adjacent sectors thus hurting macro economy, if not contained soon enough. India is witnessing the most terrible slowdown in automobile sector at the verge of slowing growth in economy and rising cost for vehicle ownership.

Given its strong backward and forward linkages with other industries and services, slump in the sales of cars and bikes will affect many upstream and downstream industries and services.

"The fortunes of India's logistics industry are closely tied with those of the automobile sector. With the auto sector in the midst of a slowdown for the past 10 months, the logistics sector is facing the heat for sure.

Hopefully with the cut down in corporate tax, the announcement Government has made recently as a measure to boost economic growth we can expect positive changes soon," adds Virwani. In India, there is going to be tremendous growth in the area of logistics and supply chain management in next 5 years and we are fortunate to contribute to this growth story.

Source: www.manufacturingtodayindia.com

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SIX TRENDS SHAPING WAREHOUSES OF THE FUTURE

MARK WILKINSON, SUPPLY CHAIN CONSULTANCY
MANAGER AT INDIGO SOFTWARE

In 2010, many warehouses would still have been regarded as a neglected cost centre.

Now, moving into 2020, the warehouse is a carefully managed control centre and very often the strategic hub of e-commerce within an ever-extending supply chain. Exciting as it is to be entering a new decade, the business landscape has been transformed, with the arrival of many different challenges, some of which depend on where in the world your warehouse operations are located.

In Europe and the US, priorities centre around making investments in automation to achieve order fulfilment targets and retaining the workers needed to sustain growth objectives. In Asia and other developing countries, attentions are directed elsewhere - towards ensuring reliable Internet connectivity and efficient transportation. One key trend that every region shares, is the arrival of social commerce and digital transformation, with business transactions at all levels continuing to migrate online, albeit at very different rates. Indigo has been helping customers to optimise warehouse productivity and improve process efficiency inside warehouses for over four decades. Here are our six key global trends to be watching out for in 2020:

Dropshipping will increase substantially : E-commerce and direct-to-consumer growth will continue to transform the fulfilment operations of retailers, manufacturers, plus their wholesalers and 3PLs. Many manufacturers and wholesalers have already started dropshipping and have disintermediated their retail partners. This trend will accelerate because it allows the seller to improve profit margins and create direct customer relationships, by building up their direct-to-consumer channels. Logistics service providers / 3PLs are also benefiting from this trend, by obtaining business from retailers that are looking to outsource some of their direct-to-consumer fulfilment.

Time to delivery becomes a key competitive differentiator : Price is no longer the main competitive differentiator. How long it takes to receive an item is becoming just as important, as Amazon has shown the industry. Fulfilment responsiveness (the time it takes from order receipt to final delivery) will increase over the next three years. In a recent ARC Advisory Group study, 77% of respondents reported they expected it to increase in importance, significantly higher than the results for the same question in 2016.

Social media commerce returns will make reverse logistics even more important : Reverse logistics was already an issue for many sellers and will become even more so in the future, thanks to the so called 'Instagram effect'. Research into online shoppers shows 34% will

make more impulse buys as social media sites make it easier to buy products directly, through in-platform selling tools. Once Instagram launches its 'Buy on Instagram' and 'Instagram Checkout' tools, it goes without saying that these impulse shoppers will end-up sending more of their purchases back to retailers. Social media buyers are expected to account for a fifth of all online shoppers who make returns.

Flexible pick methods for multiple order profiles : Picking methods like batch pick and sort will become more common, as they are ideal for cost efficiently processing high volumes of small orders as quickly as possible. Multiple orders or shipments can be picked simultaneously and then grouped into individual orders, greatly increasing the throughput possible in a warehouse by reducing travel times to gather stock items. Social or e-commerce orders can then be released in the shortest possible time for the lowest cost possible - essential if extra resources are to be utilised during returns management. If the warehouse is exceptionally busy, with a large number of pickers and different product SKUs, wave picking can also be highly efficient. This is because it cuts down on congestion between locations and allows orders to be grouped into zones for optimum productivity.

New workarounds to overcome labour shortages : In Europe and the US, a tight labour market remains one of the overriding challenges for warehouse operations managers. In a recent study, 50% of respondents said that an inability to attract and retain a qualified hourly workforce was a critical issue. For 2020 and beyond, multiple methods of strengthening warehouse workforces will be necessary, ranging from increasing pay, to offering enhanced training and benefits. Investing in operatives, for instance, by offering personal development and soft skills training opportunities, will be essential for companies to attract and retain the people they need to achieve their e-commerce and omnichannel expansion goals.

Investing in a WMS is increasingly common : An efficient warehouse runs on technology and the investment priorities of warehouse executives show that tried and tested technologies - such as a warehouse management system (WMS) and partial automation using conveyors or automated sortation systems remain top priorities. Once these essential items are in place, other supporting technologies including transport management systems, voice recognition for picking and putaway, AGVs, and palletisers are also top investment priorities.

Source: www.supplychaindigital.com

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FIVE WAYS DIGITAL TECHNOLOGY WILL TRANSFORM THE SUPPLY CHAIN

DAVID BUTCHER, STAFF WRITER
MASTER CONTROL

As digital technologies continue to evolve, manufacturers are granted more tools to collect and translate the data they need for greater supply network visibility and optimized supply chain performance. These technological advances promise to usher in the next-generation digital supply chain, or Supply Chain 4.0.

Recent analysis suggests companies around the world will continue to make significant investments in technologies and services that enable digital transformation, driven largely by discrete and process manufacturing. Despite the complexity involved in technological disruption, supply chain digitization is at the top of many organizations' list of strategic priorities, with half of recently surveyed organizations describing it as a top-three focus area.

This digital transformation has enormous implications across life science companies' supply chain. Business Impact of Digitally Transforming the Supply Chain.

Supply Chain 4.0 has leading companies using new technologies to collect and process data to identify trends, potential issues and opportunities across many systems and functionalities at once. The resultant visibility helps provide a more complete understanding of every element of the supply chain, helping companies to improve decision-making, planning, and responding to issues.

When data is digitized and connected to other data points across the enterprise by the Internet of Things (IoT) and analyzed by artificial intelligence (AI) algorithms, this data becomes more usable and highly valuable. For forward-looking companies that are taking steps toward digital transformation, research is beginning to show a clearer business impact.

According to a study by McKinsey, organizations that digitize their supply chains aggressively "can expect to boost annual growth of earnings before

interest and taxes by 3.2 percent. This growth proved "the largest increase from digitizing any business area" in McKinsey's research. Moreover, the companies making use of supply chain 4.0 tactics were also forecast to raise annual revenue growth by 2.3 percent.

Leaders in digital supply chain management are gaining a variety of competitive advantages using Supply Chain 4.0 methods. According to Boston Consulting Group, key advantages include: increased product availability of up to 10 percentage points; more than 25 percent faster response times to changes in market demand; 30 percent better realization of working-capital reductions; 40-110 percent higher operating margins; and 17-64 percent fewer cash conversion days.

Several technologies have emerged to help life science companies across the globe excel in an increasingly digital economy. According to Capgemini, IoT and automation are the leading technologies deployed at one or more sites at scale in the supply chain, with blockchain, advanced analytics and artificial intelligence right around the corner when it comes to large-scale implementation. Here we'll look at what these technologies mean for the life science supply chain.

IoT: The IoT holds real potential for optimizing supply chain operations, especially in companies' need to collect data from across millions of devices and measure performance in real time. IoT devices provide real-time visibility of operations throughout the manufacturing process, from production through distribution. Manufacturers can embed IoT sensors in most items moving through their supply chain, gaining unprecedented visibility and traceability of parts for assembly, finished goods, and more.

"Other potentially impactful supply chain use cases are in preventative maintenance, sourcing, manufacturing, logistics, demand management, and services," Gartner reported last year. "These

include improved asset utilization, higher uptime through remote monitoring and maintenance, improved customer service by better understanding customer behavior and needs, and proactively responding to and shaping customer demand.”

Automation : Automating operations and systems can streamline work along the supply chain. For many life science companies, capturing and managing supplier data often entails dealing with data manually using a paper-based or partially electronic system, and then not updating the data regularly.

Digital supplier and supply chain management solutions can be leveraged to collect and process real-time information automatically, thereby eliminating the slow, time-consuming effort of manually gathering, entering and updating data.

In operational processes, for instance, automated systems such as robotics and radio-frequency identification (RFID) can free up supply chain professionals from handling certain mundane processes to focus on more valuable tasks. This has the net effect of lowering operating costs and improving productivity. Manufacturers can expect the role of workers to be reimaged by machines and technology, not to be superseded by them.

Blockchain : Blockchain is a decentralized, shared, immutable distributed database of transactions, and it has the potential to be very disruptive. Smart contracts, traceability and authentication, and other highly decentralized supply chain management functions are considered key candidates for blockchain, although most supply chain blockchain projects are still pilot projects.

Citing serialization and track and trace as significant opportunities for blockchain application, Accenture research indicates that 64 percent of life sciences organizations are currently deploying blockchain, with another 30 percent planning to deploy it in the next few years. According to a recent PwC report, the pharmaceutical supply chain likely contains significant potential for near-term adoption.

For example, a pharmaceutical company could check history and provenance of products through the immutable transaction history on the blockchain.

Advanced Analytics : As IoT data continues growing at a rapid pace, the data is often unstructured, disorganized and incomplete. The massive amount of supply chain data collected is of little use if a company can’t quickly, intelligently analyze and leverage it. Advanced analytics can play a major role in making supply chain data usable and delivering significant benefits.

Advanced data analytics are providing greater insights into processes, products and people, and in turn, enabling supply chain leaders to make better decisions to improve operations and business. Promising use cases include demand/supply planning and predictive maintenance. For instance, Gartner says, “Prescriptive analytics can improve decision making in functional areas like supply chain planning, sourcing, and logistics and transportation, and can be deployed to improve end-to-end supply chain performance.”

AI : AI and machine learning technologies, which learn over time as they are exposed to more data, have great potential to transform supply chain processes. They enable companies to collect data from a variety of areas and apply self-improving analysis, and as they are integrated throughout the supply chain, they will likely facilitate the automation of repetitive tasks and deliver intelligence throughout the supply chain systems.

Capgemini research shows that “AI delivers significant transformational benefits, from reducing churn to increasing regulatory compliance.” AI can be used throughout the supply chain to find patterns, forecast future scenarios, identify and correct data errors, surface risks, elevate IoT insights, and improve material planning, order scheduling and logistics.

Conclusion : The promise of digital transformation in the global supply chain is greater access to actionable data as a means of increasing operational effectiveness. In a recent Aberdeen study on manufacturing operations, approximately 47 percent of organizations said they believe they need to become more data-driven to remain competitive. Large-scale change is hard, but digital transformation presents the opportunity to revolutionize the supply chain and generate new business value throughout it.

Source: www.mastercontrol.com



KEY AREAS THAT WILL DRIVE SIGNIFICANT GROWTH IN INDIA'S LOGISTICS SECTOR 2020

As time progresses, the definition of logistics in the industrial world and the global market keeps evolving continuously. The growth rate of logistics in India has shown tremendous improvement in the last decade, starting from scratch and reaching a level where the Indian logistics industry is competing with the top dogs of the most affluent countries. Since there is potential for unlimited improvement, the Indian logistics reports will always highlight areas where improvement could be implemented for better performance in the next year. The key areas for logistics growth in 2020 are as follows.

Logistics Sector In India Overview And Challenges :

There is no doubt that the Indian logistics industry is the backbone of our economy. Our world logistics index rankings have come a long way since the beginning of its slow ascent to success. In 2014, the Indian logistics industry ranked 54th globally in the Logistics Performance Index. Moving to 2018, the ranking jumped to 35th and showed a massive improvement in the logistics system. Today, the growth rate of the logistics industry in India is interlinked to every industry and has amalgamated itself with technology, recently emerging service providers and infrastructure. The Indian logistics industry in 2019 is officially the most promising industry along with the quickest growth seen.



Currently, the value of the Indian logistics Industry in 2019 is said to be around \$160 Billion and the world anticipates this to grow to at least \$250 Billion in the year 2020. This growth can be attributed to the increasing number of e-commerce retailers and their stellar services to the citizens of the country. So, why is logistics growth important? People already rely on e-commerce for their needs and till the year 2020, there will be a huge online-shopping market for the logistics industry to tap into. The entrance of several MNCs into the FMCG sector of the country also creates new avenues of opportunity for the Indian logistics industry to grow. These new and upcoming sectors' progress has a direct impact on the growth of the Indian logistics industry's inventory management and effective warehousing solutions for the retail industry.

Several companies from various industries are heavily relying on the Indian logistics industry to help them in serving the customized demands of the customer base. This will help the logistics industry to reach a CAGR of over 7% by the end of the year 2022.

While it is doing substantially well, there are areas that definitely call for a review and improvement. The ideas to improve the logistics industry in India currently revolve around reducing the costs of logistics for customers while providing top-notch services with the given budget is one of the constant challenges the Indian logistics industry faces. Increasing affordability encourages corporates to heavily invest in logistics services through tie-ups or outsourcing help. A lack of proper storage and stockpiling training has also been experienced in the logistics industry. By such companies establishing training and development centers, the industry can create trained professionals meant for the logistics industry rather than employing semi-skilled or skilled labor.

Trained personnel to monitor automatic stockpiling, proper storage and cargo safety will increase the profits since the losses will marginally be cut down. Creating an inventory stock portfolio, stock removal and maintenance system, the Indian logistics industry in 2019 can gain efficiency in cost-cutting for more retained earnings.

Since the warehousing system plays an important role in the manufacturing industry in aspects like global procurement and new models of sales and distribution. Improving the current technology by investing in recent research and development using indigenous and domestic technology will boost the economy by pushing other industries like tech to perform better as well. Making constant changes and upgrades in the operations system of the logistics companies will bring the benefit to the customers since this creates an environment of healthy competition while bringing the best services forward. In 2020, we expect to see substantial changes and development in these key growth factors for growth of logistics in India.

Infrastructure Development : The Indian Government keeps reaffirming its aim to improve the logistics industry in India by making attempts to modernize the functionality starting with infrastructure development. The administration has introduced key infrastructural development projects to increase access to the untapped rural markets in the country. These projects will focus on bringing more efficiency to the supply chain and improve connectivity issues faced due to the geographical vastness of the country and the different terrains present. We'd think that infrastructural development pilot projects may bring about all the change necessary but there are also other factors.

Logistics education, training, and an understanding of the framework are very important for the overall progress of the logistics industry just as hardcore infrastructural development is.



Boost In Policies And Regulations : Revolutionary policies and reforms rolled out by the Indian government such as the Goods and Services Tax (GST), granting of the infra status, and relaxing the FDI policies will play a major role in 2020 with the boost of the Indian logistics industry received. GST changed the face of the way Indian logistics worked. Since then, the logistics industry shifted towards creating logistics with multi-modals and large formats, Industrial centers that can act as goods distribution and aggregation hubs were also encouraged to expand due to the introduction of GST.

The point of advantage GST gave to logistics companies was saving on their organization and capital. Where they had to run several warehouses all over the country that attributed to a huge overall expense in the storage department, they can now use a few but huge capacity warehouses that save them the costs of maintaining multiple warehouses and transportation. This system improved the model of freight and cargo movement that the logistics companies used for transportation from manufacturing units to the warehouses, wholesale market, retail market and the points of sale. The growth of the e-commerce industry and the FMCG industry's expansive policies.

This will help logistics companies increase the amount of load they carry in single trips, the way they move goods from small manufacturing units in order to save on transportation costs while keeping a great service quality for customer satisfaction.

The Advantage Of Adopting The Latest Technology : The advent of technology in the logistics industry has spelled loads of progress in the operations and various systems. Technology such as artificial intelligence, machine learning and the internet of things are meant

to move the foundations of traditional and old-school logistics operations in the country.

Though it may take some time, it shows promising results to make better improvements in productivity than any other means while streamlining the operations systems of the Indian logistics sector. When such modern technology can replace a system that is prone to error, we expect great things to happen.

The backbone of the economy will turn stronger and in return strengthen the other sectors of the industries. Even though many might debate that adopting these technological advancements is expensive, it is in the best interest of the logistics industry to integrate their organization with them before the gap between their current and the future technology becomes vast.

That will backfire their attempts to cost-cut and increase their expenditures at least three-fold. Integrating such technology calls for initial investments like installation, test runs and training the personnel to run these programs, but once completely set up, the companies will experience a new world of streamlined processes that the older technology could never compete with. In 2020, technology will make space for logistics industries to make space to handle bigger clients because of powerful management tools.

The Future Perspective : Looking at the big picture, on the global level, Indian logistics as an industry has come a long way and is expected to keep a significant upturn in performance on the world's platform. Companies and International Corporations joining hands with the various logistics companies of India will create a mutually beneficial relationship by reducing their logistics costs, increasing transportation abilities for the customers while bringing much-needed income to make the logistics industry the biggest industry of the country.

In the future, we can expect specialized operations for logistics and delivery to be in high demand from clients of all walks. Be it technological spare parts, automobile equipment or food delivery, everyone will soon bank on the efficiency of a streamlined logistics industry to fulfill all the transportation, storage and delivery needs of all industries. The advancement of e-commerce will soon reach a new high, resulting in more opportunities for the logistics industry to make a mark on express deliveries and round the clock services apart from the company's in-house logistics system.

Conclusion

While the Indian logistics industry was once considered to be a service provider, now it is classified as an end to end solutions provider for multiple sectors of the industrial realm. In 2020, the worth of the logistics industry will expand to roughly \$250 Billion due to the key areas bringing a substantial improvement to operations and overall management. Apart from improving global rankings, it is safe to say that anticipating the Indian logistics industry to become the dominant industry in the country.

Source: ithinklogistics.com

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DIGITALISATION: HELPING COMPANIES TRANSFORM THEIR LOGISTICS & SUPPLY CHAIN MODELS

SANDEEP KUMAR

Logistics and Supply chain (L&SC) is often regarded as the main constituent of a country's economy. It is one of the most cost-effective resources on which the wheels of the company/retailers and brand runs. Efficient supply chain management has a cascading impact on all aspects of retail—from sourcing of raw materials based on demand forecast and then speeding up the production to getting the product to the store and finally to the consumer, everything depends on the L&SC. As per CARE ratings, India's logistics industry is projected to be worth US\$ 215 billion by 2020-21, recording a 10 percent compounded annual growth rate (CAGR) over its approximate size of US\$ 160 billion in 2016-17. In India, the logistics industry continues to grow and prosper, and the credit of this improvement goes to retail, e-commerce, manufacturing and various other sectors.

The rise in e-commerce consumption, as well as domestic logistics, has also contributed and added more improvement and advancement in the Indian logistics market 2019. As per the report, the industry's growth will be fuelled by the strides in manufacturing, retail, fast-moving consumer goods and e-commerce sectors. Development of logistics related infrastructure, like dedicated freight corridors, logistics parks, free trade warehousing zones and container freight stations, are expected to improve efficiency.

Efficient supply chain management has a cascading impact on all aspects of retail – from sourcing of raw materials based on demand forecast and then speeding up the production to getting the product to the store and finally to the consumer, everything depends on the supply chain. Experts unanimously agree that besides infrastructure and complications in taxation, it is the efficiency of manpower and adoption of technology that gives a huge boost to supply chain management. However, it still remains to be seen whether the Indian Retail Industry has actively invested in the smooth running of its back-end supply and logistics.

“The logistics industry in India is set to become more forward-looking, and as per the Economic Survey 2017-18, is expected to reach US\$ 215 billion in 2020, growing at a compound annual growth rate (CAGR) of 10.5 percent. A considerable degree of consolidation is in the offing, with larger warehouses, and more organised setup. Fuelled by innovation and digitization, the Indian logistics industry will encourage functional excellence with integration and collaboration to a large extent. The digital age will be so intertwined with the logistics

industry, it will be difficult to separate the two, I feel,” says Rubal Jain, Managing Director, Safexpress. Transportation has always remained the dominant factor in this segment. With around 80-85 percent share in the value terms currently, the percentage is set to remain high in the coming years. The remaining percentage is the storage factor. Together, these two components make L&SC, one of the most employment intensive segments, absorbing more than 20 million people.

Indian Logistics Industry : At present, the Indian logistics industry is highly fragmented and unorganised owing to the presence of numerous unorganised players in the industry, with the organised players accounting for approximately 10 percent of the total market share. With the consumer base of the sector encompassing a wide range of industries, including retail, automobile, telecom, pharmaceuticals and heavy industries, the logistics industry has been increasingly attracting investments in the last decade. Further, the logistics industry faces challenges such as under-developed material handling infrastructure, fragmented warehousing, multiple regulatory and policy-making bodies, lack of seamless movement of goods across modes, and minimal integrated IT infrastructure.

In order to develop this sector, focus on new technology, improved investment, skilling, removing bottlenecks, improving inter-modal transportation, automation, a single-window system for giving clearances, and simplifying processes would be required.

Costs, GST & Logistics : Logistics costs have a significant bearing on exports. It is estimated that slashing logistics costs by 10 percent could widen exports by five to eight percent. Steep logistics costs –13-14 percent of India's GDP– vis-a-vis other nations have always been a worrisome issue. The figure is higher compared to 10-11 percent for BRIC countries and eight to nine percent for developing nations. USA spends around 9.5 percent of the GDP on logistics. Higher logistics costs in India could be ascribed to the lack of efficient inter-modal and multi-modal traditional systems, the ratings agency said in its report.

However, the logistics costs as a share of the GDP is expected to decline, and certain initiatives have played huge role in creating this paradigm. Complications in taxation and costing are one of the biggest hurdles gripping the industry besides infrastructure. Where Goods and Services (GST) has been introduced to

simplify the taxation woes to an extent. The other initiatives, which are also contributing a lot in reducing the costing and improving the infrastructure of and increasing the GDP include:

- Implementation of GST
- Investments in road infrastructure
- Development of inland waterways and coastal shipping
- Dedicated freight corridors

“With the logistics sector getting an ‘infrastructure’ status, the rolling out of GST, and technological advancements, the logistics industry today is set to make a quantum leaps into the future. A few years later, I feel we won’t even recognise the Indian logistics industry as it was – ignored, unorganised, with small players trying to minimise their operating costs and having to deal with daily firefighting,” says Jain.

As explained earlier, at present the Indian logistics industry is highly fragmented and unorganised. Owing to the presence of numerous unorganised players in the industry, it remains fragmented, with the organised players accounting for approximately 10 percent of the total market share. However, with the consumer base of the sector encompassing a wide range of industries, including retail, automobile, telecom, pharmaceuticals and heavy industries, the logistics industry has been increasingly attracting investments in the last decade.

Nonetheless, there are many challenges to be addressed including, but not limited to, under-developed material handling infrastructure, fragmented warehousing, multiple regulatory and policy-making bodies, lack of seamless movement of goods across modes, and minimal integrated IT infrastructure. In order to develop this sector, focus on new technology, improved investment, skilling, removing bottlenecks, improving intermodal transportation, automation, a single-window system for giving clearances, and simplifying processes would be required.

Challenges : The last mile delivery for products – be it then in retail or food products – to different urban and rural areas remains a key challenge. In Tier II & III towns and suburbs, transportation is a misery. Some of the big players have started delivery by air shipment to ensure products reach on time and are fresh to consume for their buyers. Some of the other key bottlenecks include:

Instability in Supply & Demand: There is no limitation and restraint to the demand of the consumers and to sustain in the business, retailers have to meet them at any cost. So, to fulfil these demands, companies spend a lot in proper planning to cover up the risk management involved.

Pressure to Deliver: Pressure to deliver is a continuous process and requires efficiency focus to deal with it every time.

Talent Availability & Gap in Skill Set: This is another

major setback of the supply chain industry. There is a scarcity of talented and skilled labour in this segment. Labour will be abundant, but right skilled labour is hard to come by. Creating a selective automation, capability development and better work environment also remains a tasks.

Right Pricing: Having the right pricing strategy and tools is another factor to consider. It is a well-known fact that 50 percent of promotions don’t generate the necessary ROI. Retailers need a pricing tool which not only helps them automate decision making across the enterprise but also provides important metrics like halo and cannibalisation to compete effectively.

“The last five years have witnessed significant shifts in the way customers and businesses have evolved. Now the customer is highly demanding, and needs have evolved which has proportionally leveraged the value of his money spent. Companies, meanwhile, have started working across all the verticals. With sales being the primary driver, customer sales, demand, likes and dislikes were being recorded for building the right product, but Supply Chain Management has been struggling for capturing the accurate information that would help to improve demand forecast, decrease sales variability to eventually improve the service levels. The distribution system was in naïve state, as it focussed on primary stock movement from factories to distribution centres – which was the bulk cost involved, but least focussed on optimal load movements, moving production units closer to demand, stressing on last mile connectivity and the most ignored was customer service level improvement. There was lack of proper infrastructure in terms of logistics (multi-modal transport) and good quality storage spaces. The frozen industry has still miles to cover with the current refer trucks infrastructure, which is just ~15 percent of our actual requirement (9000 no.s against 62000 Req’n). (source: NCCD 2015 –All India Cold-chain Infrastructure Capacity Assessment of Status Gap).

There had been dearth of mature third-party logistics/ 3PLs who can help leverage and improve the customer servicing,” explains Vishal Kumar Gosike, Head, Supply Chain- Innovative Foods Limited, Brand Sumeru.

“Some challenges do exist in the logistics between the channel partner and the retailer. One major difficulty that we face is with respect to the timely delivery of orders from partners to retailers. To overcome this challenge, we have started delivering supplies to retailers in the form of ready stock units,” says Ashok Chopra, Country Head at Fresca Juices.

What Retailers Can Do : Retailers and organisations must invest in guides to experiment and learn about emerging themes. Today the budget of the organisation is fully focused on next year operational plan. It is important to carve out investments (in terms of every possible resources) to experiment with pilot preparedness of potential future scenarios.

Modernisation of supply chains will require a combined effort from government, private industry and foreign investments. The challenges are also amplified by volatile demand and increasing expectation of the consumers, changing trends and preferences of the consumers, increasing number of SKUs and the huge Indian customer base – ranging from highly populated metro cities to millions of sparsely populated villages.

Role of Technology in Supply Chain Management : Hemant Gupta, Chief Operating Officer & Chief Finance Officer – The Mandhana Retail Ventures Ltd. says, “Due to lack of technology, there was a huge gap in the time taken between the arrivals of merchandise in the warehouse until the time taken to dispatch the goods as all the processes were then done manually.

The introduction and advancement of technology has played a very important part in the supply chain, including the logistics and warehousing functions. We now have an electronically generated process which helps decide the key responsibility area which clearly indicates the cycle for the goods to come in and move out. The entire supply chain management functioning has evolved over a period of time and has been structured in a way to adhere to timelines accordingly which help to reduce our working cycle capital of the overall supply chain management. For e.g.; to track a package, earlier one would have to manually dial a number and call the logistic partner to find out where the package is, today most of the logistic partners have developed websites with GPS enabled systems thus making tracking easier.”

“We use an ERP called Genesis which is a retail solution. It has an in-built operation that tracks all the processes including billing, tracking and tallying the goods. It also helps us manage our inventory agent which is an important part as far as the supply chain is concerned,” he adds. Vasanth Kumar, Managing Director, Lifestyle International shares, “At Lifestyle International we have successfully implemented Oracle ARS as well as TOC Symphony software apart from a single view inventory (SVI) order management for effective last mile deliveries from warehouse.”

“Technology has been proving a big enabler in improving the servicing part of Supply Chain. We largely depend on WMS for improved TAT & inventory management. It helps in maintaining FEFO (First Expiry First Out) principle, warns on ageing alerts, helps in quicker navigation inside the warehouse. We use standalone applications for daily production monitoring, RM/PM indent generations. Nowadays, quite a good number of companies are interested in looking for technology solutions which give quick scaling options as well as improved visibility & analysis for better decision making. They are moving from tradition excel based tools to automated scripts and systems, which would save on time, resource effort and accuracy. Now with the convenience of android apps & mobile revolution, most of the HR notifications, approvals, tracking is

made available in their respective mobile that are improving the speed of auctioning,” explains Brand Sumeru’s Vishal Kumar.

“To facilitate smooth supply chain management, we use a mobile app called Field Assist. The app enables our sales partners to book orders and also allows us to track the supply. The app was created just a year ago to make our supply chain management process more seamless and efficient,” adds Fresca Juices’ Ashok Chopra.

“SCM and Technology have become synonymous. Digitization of business processes has become more of a necessity than a value-add proposition. This has increased the requirement for creating a digital environment that seamlessly integrates the operations carried out by various entities in the supply chain.

Technological advancements now enable businesses to build end-to-end supply chain solutions that speed up processes and avoid bottlenecks in the supply chain. Business Intelligence tools have helped to improve forecasting and identify areas of concern without any major time lag.

Lastly, it is a matter of survival. With the advancement of technology, market disruptors have spawned and one has to be dynamic to ward off these challenges and retain market leadership – and believe me, without technology, one just cannot be dynamic. With growing e-commerce buyers, retail Indian companies are fast adapting the new technologies to give customer delight,” says Ritesh Shroff, Vice President – Business Excellence, Kurl-On.

Last Mile Delivery: Benefits : Retailers who provide a great last-mile delivery service has following benefits:

Faster Delivery – An Opportunity to Build Loyalty: If given faster delivery options, consumers will be more loyal. For example, a two-hour delivery option, increases loyalty towards a company by leaps and bound. The same holds true for same day delivery as well. But when delivery moves out to three days or more, the percentage of loyalty dips to a very large extent – only about 30 percent retailers say this will increase their loyalty. This likely reflects that consumers see this as a commoditised, mainstream option that is offered by most players. Despite the loyalty opportunity at hand, only a handful of firms offer two-hour or faster delivery. Making faster delivery options available is a significant opportunity for leading firms to differentiate themselves from their competitors and meet consumer expectations.

Satisfied Consumers Pay Higher Delivery Charges for Fast Delivery: Satisfied consumers are willing to pay more for fast delivery as a value-added service, and few are ready to pay premium charges as well for the fast delivery.

Satisfied Customers Purchase at a Higher Frequency: A successful and timely delivery results in happy customers. A satisfied customer eventually turns out

to be regular shopper with the same brand/ retailer/ organisation.

Digital Supply Chain Initiatives : As per a Capgemini report, the digital supply chain is a new entrant on the L&SC platform. A digital supply chain includes new initiatives which use digital technologies to optimise operations across the entire supply chain by enabling connectivity, data management, insights, and smart automation. The digitisation of supply chain refers to:

Taking a process or task that is performed manually or offline today and delivering it more efficiently with digital tools Using digital processes and data to make something more effective and consumer-centric

The benefits of supply chain digitisation can be wide ranging – cost savings, improved customer satisfaction, or even the launch of an entirely new business model. For example, Amazon is looking to roll out its drone-based ‘Prime Air’ program to deliver customer shipments within 30 minutes. This will reduce the operational costs of last-mile deliveries and improve customer satisfaction.

Moreover, it will also open up opportunities for new business models – for example, charging fees to customers for this sub-30-minute delivery or letting other retailers pay to use prime air’s infrastructure.

“Blockchain, for instance, is one of the newest kids on the block. A distributed database that transfers information with a timestamp and the Blockchain is able to pinpoint the source of the product and bring transparency to operations. As a matter of fact, in March 2019, India’s Coffee Board launched blockchain-based coffee e-marketplace. Blockchain not only

improves supply chain security and addresses probable fraudulent practices, but also makes processes seamless, with accurate recording of data and the ease of tracking updates in real time,” says Rubal Jain.

With the aggressive pace of economic growth, India is on a fast track to development, powered by innovation and disruption across key sectors, encouraging government policies, and robust and aggressive growth in IT and the Logistics Sector is benefitting, undergoing an unprecedented transformation, fuelled by technological innovations.

It is widely accepted that digitalisation is already enabling organisations to transform their supply chains from corporate cost centres into competitive differentiators. Going forward, we will start to see supply chains develop beyond individual networks into vast ecosystems.

As per a Capgemini report titled ‘The Digital Supply Chain’s Missing Link: Focus’, strong, collaborative partnerships offer significant opportunities, such as collaborative design (with upstream partners) and collaborative demand planning (with the downstream partners).

This will lead to a new reality of the multi-enterprise supply chain that requires new operating models in which humans and machines work seamlessly together and supply chains will ultimately become platform-powered, ensuring multi-enterprise visibility and collaboration based on ‘no-touch’ processes.

Source: www.indiaretailing.com



COMMODITY INDEX

Commodities	Days's Index	Prev. Index	Week Ago	Month Ago
Index	2865.2	2871.3	2875.5	2812.2
Bullion	5809.2	5802.8	5778.0	5582.9
Cement	2364.7	2364.7	2364.7	2331.0
Chemicals	1918.7	1918.7	1920.7	2013.4
Edible Oil	2079.3	2138.3	2171.6	1998.9
Foodgrains	2534.0	2542.9	2553.0	2533.6
Fuel	2715.3	2733.1	2745.6	2665.3
Indl Metals	1918.9	1918.9	1918.9	1918.9
Other Agricom	2315.2	2315.2	2318.8	2212.9
Plastics	1731.3	1731.3	1731.3	1727.9

Source: ETIG Database dated 20th January, 2020



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 12 things/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-1 not 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 31st meeting had decided that a new GST return system will be introduced for taxpayers. New simplified automated 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 effective 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 government'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, 2019 has 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 office of the CBIC across the country and would be effective 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 officers 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 •-

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 officer 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 officer 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 officer 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, • The information available from E-way bills,

• 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 officer 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 officer 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 off.

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.

STATES SEEK REAL-TIME ACCESS TO GST RETURNS, E-WAY BILLS :

Certain states have sought real-time access to annual Goods and Services Tax (GST) returns and e-way bills in order to check tax evasion, which can potentially address the ongoing fund crunch and help compensate states for their revenue shortfall, two officials aware of the matter said requesting anonymity. Currently, these data are stored in the GST Network, which compiles reports and sends them to all the states and Union territories with a time lag.

Kerala finance minister Thomas Isaac confirmed the development and said, **"Kerala may not require compensation cess at all if it is permitted to have real-time access to annual returns and e-way bills, so that tax evasion could be curbed,"** Isaac said. According to Isaac, ineffective tax collection is one of the three key reasons for tardy GST revenue collections across the country and real-time information would help many states nab evaders through the use of data analytics. The other two reasons, according to him, are the economic slowdown and steep cuts in GST rates.

"I will raise this issue in the GST Council," he said. The GST Council is the apex decision-making body of the federal indirect tax structure that was rolled out on July 1, 2017. It is chaired by the Union finance minister and has finance ministers of states and Union territories as members. Officials said states' access to real-time data could be possible if they formally raised the issue at the council. Several states have been raising the issue of large-scale GST evasion at the council. In August last year, West Bengal finance minister Amit Mitra estimated GST evasion at ¹ 1 lakh crore and demanded an exclusive meeting on the issue.

Owing to inadequate compensation cess funds, the Centre has not yet compensated states for their revenue shortfall over two months of October and November. Ideally, that should have been paid by the second week of December. **Even in the past, there was a delay of about two months in paying compensation for August and September, which was paid just two days ahead of the 38th GST Council meeting on December 18, 2019. An amount of ¹ 35,298 crore was released on December 16 to pay states for their dues in August and September.** The GST law assures states 14% growth in their revenue for five years and the Centre is committed to meeting any shortfall in revenue through cess money, which is levied on luxury goods and sin products such as liquor, cigarettes and tobacco products.

The finance minister of another state, who did not wish to be named, said that there was scope for improvement in GST compliance but that would not be able to meet the entire revenue gap. Commenting on the proposal on real-time access to GSTN data, the minister said, **"I doubt this will eliminate the revenue deficit. The ball is always in our court , provided those at the helm allow it to be dealt with efficiently."**

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ROADWAYS WILL PROPEL ECONOMIC GROWTH OF THE COUNTRY: GEN V K SINGH, MOS, ROAD TRANSPORT AND HIGHWAYS

The industry needs to explore new technological advancements to adopt road sustainability, said Gen V K Singh (Retd), Minister of State for Road Transport and Highways at an ASSOCHAM event held here today.

The industry needs to monetize road-side amenities to address financial challenge, said Gen V K Singh (Retd), Minister of State for Road Transport and Highways highlighting the importance of roadways in propelling the country's growth at an ASSOCHAM event held here today.

The good road connectivity is key for driving economic and social development of a country. Roads are the engines of the economy enabling seamless movement of people and material across the length and breadth of the country. In a growing economy like India with a target to reach USD 5 trillion by 2025, good quality roads will play a critical role in boosting industries and market accessibility, said Mr. Singh.

While addressing his inaugural address, Mr B K Goenka, President ASSOCHAM said, the Government has outlined its vision of investing Rs 100 trillion in the infrastructure sector by 2024 and has set an ambitious target of building almost 45 km of roads per day – up from 9km/day just four years ago – this fiscal year. The 24,800 km Bharatmala project, running through economic corridors, border and coastal areas and expressways has a completion deadline of 2022 and is expected to give a big push to the economy by generating jobs and increasing demand for everything from steel to cement.

The land acquisition processes have improved over the past years, but land prices have gone up in recent years. This has impacted viability and capital expenditure outlay in some projects. The NBFC & ILFS scenario coupled with the public sector banks' reluctance to lend has impacted new projects, said Mr. Goenka.

Project financing has become much tougher which has led to delays in financial closure of projects and, in some cases, stalling of projects under implementation. While we have seen several rate cuts from RBI, these have not been passed on to the borrowers by the Banks. This is leading to increased interest cost for the projects

which in turn is affecting its viability, said ASSOCHAM President. Pending claims is also an important issue affecting the cash flow of the infra players. There are several claims which have been awarded in favour of the developer/contractor which have not been released by the relevant authorities, noted Mr. Goenka.

We request the authorities to release at least 75% of the claim amount without the bank guarantee. Also, since Infrastructure industry being a labor intensive industry and amongst highest employer, there is an urgent need to streamline the labor laws.

As the industry is facing the acute funding issues, the Government can also look at developing bond market for long term infra project financing. This should also be supported by credit enhancement mechanisms to improve the credit ratings of the bonds which in turn will ease out the financial constraints in the sector.

India needs fast growth in road capacity building, not only in highways but also in rural areas and backward hilly areas. The Pradhan Mantri Gram Sadak Yojana (PMGSY) is a significant initiative to provide all-weather road access and connectivity to rural. This would enhance livelihood opportunities, market linkages for local produce and bring the rural areas closer to the mainstream economy. It has the potential to renew the shape of our rural landscape. While we enhance our capacities and build our roads and infrastructure, we also need to be mindful of the growing concerns on sustainability in planning, design and operation of road infrastructure. In the rural areas, which have about 60-70% of our population, the access has a lot of scope for improvement.

During his concluding remarks, Mr. Vineet Agarwal, Vice President ASSOCHAM said, Sustainable roads and road safety need to be integrated in all the phases of planning, design and operation of road infrastructure. Road safety management and enforcement of traffic safety regulations have not kept pace with the development. New technologies and value engineering can play major role in making roads and highways sustainable and safe.

Source : Newspaper

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FUTURE OF HEALTHCARE IN INDIA

SHEKHAR C. MANDE, DIRECTOR GENERAL,
COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH & SECRETARY
DEPT. OF SCIENTIFIC AND INDUSTRIAL RESEARCH

Summary : Rapidly changing life styles have been posing interesting challenges to the healthcare systems around the world. In addition, developments in Artificial Intelligence, and its potential applications in healthcare sector have opened up exciting opportunities.

As healthcare is one of important pillars of an affluent nation, in this article I have attempted to articulate the role of integrated development of healthcare system in India, and the role of modern technologies for its management.

The history of mankind spans hundreds of thousands of years with our civilizations less than ten thousand years and for the first time a billion humans occupied the planet was at the beginning of the 19th century. Today 7 billion Homo sapiens dominate the planet like no other species has ever had in the history of our planet.

In the course of this frenetic change, the last century has witnessed dramatic changes in every sphere of life including environment, habits and lifestyle, driven by rapid advances in Science and Technology. These changes are only going to accelerate further in the coming years. It has often been argued that

the human body has faced changes in environment much more rapidly than what it could adapt on the evolutionary time scale. Modern historian Yuval Noah Harari quotes: "The body of Homo sapiens had not evolved for such tasks. It was adapted to climbing apple trees and running after gazelles, not to clearing rocks and carrying water buckets. Human spines, knees, necks and arches paid the price.

Studies of ancient skeletons indicate that the transition to agriculture brought about a plethora of ailments, such as slipped discs, arthritis and hernias". On the other hand, reduced evolutionary selection pressure on humans has permitted greater human genetic variations to be retained than would be possible in a survival of the fittest world.

This raises the exciting possibility that diverse polymorphisms in hundreds of genes in humans will enable adaptation of humans at a rapid pace. Today, in the age of genomics and genome engineering, it is even possible to learn from such natural variations and induce them at will. Thus the same rapid changes that threaten our survival, also seem to enable it- a paradox that will need to be debated at a wide scale.

Here, I touch upon human health and how it will be impacted by rapid changes in lifestyle, environment and science and medicine.

Health is recognized to be one of the key factors for the wellbeing of societies. It is often said that the success of people or the organizations, societies or nations critically depends upon their human capital. Health and education are the two most important pillars for the development of human capital and thereby economic success of nations. Between these two, health and wellbeing of humans, in terms of lifestyle, has indeed seen some of the most rapid changes in the last two centuries. Paying attention to these two factors will therefore be rewarding for the success of societies and nations.

Central to human health are the practices of medicine, which have seen some of the most dramatic changes in the last two hundred years. The science and technology drivers of changing medical practices is a complex and fascinating subject. Most of the traditional medicines were derived through the knowledge gathered by generations of practitioners over millennia, with the use of natural resources such as plants and minerals.

The practices were particularly well established in India and China. In Ayurvedic practices in India, the treatments were highly personalized and these practices attempted to improve the overall wellness of a person. The interventions were also largely extracts of plants, rather than purified substances from them.

On the other hand, modern medicines have been

designed with the hypothesis that for every disease there is a cause, similar to the Koch's postulate for communicable diseases, and the cause needs to be corrected by targeting the causative organism without affecting the host- similar to Paul Ehrlich's hypothesis. Most of the modern drugs therefore aim to remove or counter the cause of the disease. Yet the cause for most non-infectious diseases remains poorly understood, leading to poor efficacy of most drug-based treatments for complex lifestyle diseases.

This failure of modern medicine, despite scientific rigor, is well captured by the simple figure of number needed to treat (NNT) to prevent one outcome e.g. heart attack. The most commonly used medications have NNT greater than 5 and for some widely used drugs like statins, NNT for preventing one heart attack may be as much as 100. Given the relatively higher emphasis of traditional medicine on lifestyle, India needs to balance both the traditional and modern practices for its own growth and prosperity.

The three pillars of healthcare- prevention, detection and cure, have all undergone rapid changes in the last few centuries. Moreover, due to the fast changing life styles, a fourth pillar has been recently added, which is wellness. In addition, predictive and personalized care has emerged as an integral component of all the four pillars. Personalized care has emerged due to the scientific evidences that genetic make-up of people makes them uniquely susceptible or resistant to certain diseases, and to standard therapies. Such susceptibilities or resistance even extends to rare genetic disorders where the same deleterious mutation may manifest very differently between people owing to compensatory genetic changes or lifestyle and environmental factors.

Moreover, in addition to genetics an exciting component with significant bearing on human health is currently emerging, which is closely linked to life style of people, that is the composition of microbial species living on or inside the human body, also called as the microbiome. The microbiome likely plays a crucial role in all aspects of human health including personalization of medical practices. Increasingly therefore we are likely to witness integration of personalized medical attention, similar to what has been practiced for long in the traditional medical practices.

As discussed above, in certain individuals, due to their genetic makeup, some of the disorders might never

manifest as a disease. The genetic make-up of a person also makes personalized therapies possible if the person is afflicted with a disorder by predicting these in advance. Significantly, some disorders with unfortunate outcomes can be predicted in advance allowing counseling of parents before they bear children. Further, some of the lifestyle related diseases can even be delayed or prevented by following "healthy" practices, or by appropriate nutrition. It is therefore obvious that understanding human genome variation has led to some of the most dramatic changes in human lives in the last few decades, with much faster changes in the offing in the coming years.

As highlighted above, a major point that has emerged in recent times in contravention with the modern medicine hypothesises that different people have different genetic variations, and therefore appear to respond differently to the drugs. A startling observation has been that more than 75% patients receiving the standard drugs do not derive the expected benefit (Schork, Nature 2015, 520: 609). This possibly made Voltaire to make multiple caustic remarks such as "the art of medicine consists of amusing the patient while nature cures the disease".

While the non-responsiveness of drugs is partly attributable to poor understanding of the correct targets, a large component of the differences in efficacy of the drugs is likely to arise out of variable genetic make-up of the people, although the involvement of specific genes in the effectiveness of the drugs is poorly understood at present. Similarly, the human microbiome might also play a crucial role in the lack of effectiveness of drugs. Thankfully, due to the genomic revolution(s), it might now be possible in the distinct future to address such issues.

The sequencing of complete human genome provided major boost to the understanding of disease predisposition and treatment. In this context, one of the fascinating aspects of the genome is that it possesses variations among people which can be mapped on the genome sequence. In countries such as India, there are a large number of endogamous populations, that should enable the study of population level genomic variations and disease association.

In certain groups of people, the genetic variations have been transcended through generations, where one of the ancestors had a mutation, which percolated to the whole group seen today. These

group of people therefore have acquired characteristics with respect to a certain disease, or responsiveness or otherwise, to certain drugs. The clinical trials of drugs might have overlooked such group of people before the drug was approved for use, and consequently these groups of people are refractory to the drug. Moreover, an important aspect often overlooked is the potential adverse drug reaction in these groups of people to medication. Some of the genomic polymorphisms might be associated with adverse drug reactions (ADRs) and Indian Pharmacopoeia Commission maintains a database of such ADR's, but the genomic basis of this has not yet been addressed effectively. Clearly, effectiveness of most of the modern medicines is known to vary in different populations.

It is noteworthy that these medicines have evolved after extensive human trials in the Western countries. The dosage and efficacy of drugs on the South Asian population is therefore even less understood. Drug discovery and subsequent trials therefore needs to be undertaken in India at a much larger scale than is present currently.

In India, rare genetic disorders are even less understood and many such disorders run in families due to endogamy and their closely knit social structures. It is estimated that about 70 million Indians may be affected by rare genetic disorders putting significant burden on the healthcare system. However, due to the combination of lack of public awareness, lack of easy genetic tests to assist clinicians, and most importantly, lack of deep understanding of the mutational spectrum that every individual carries, the rare genetic disorders often go un-noticed and could take up to seven years before correct diagnosis is reached.

CSIR- Institute of Genomics and Integrative Biology, Delhi, who sequenced the first Indian human genome, is working toward developing rapid diagnostics for rare genetic diseases, as well as CRISPR/ CAS genome editing based therapeutics where possible. Through the work undertaken at CSIR and elsewhere it is hoped - . that India will be firmly on the path of genomic medicines for the future.

While genomic medicine and personalized medicine are the future, it is critical that all Indians have access to adequate health care. With this objective in mind, the Government of India recently announced an ambitious plan for the health coverage of its people in the Pradhan Mantri Jan Arogya Yojana or Ayushman Bharat.

This is historical and significant step towards universal health coverage, where among the many objectives, the scheme aims to establish 150,000 health and wellness centers across the country to provide comprehensive primary health care services. Wellness industry is currently estimated to contribute to more than 5% of the global economic output. In India too it is expected to grow rapidly in the coming years propelled by the Ayushman Bharat scheme. Going forward, integration of genomic services in the health and wellness centers will be of huge value. Consequently, the healthcare sector is poised for a marked growth in India, and potentially would bring transformation in our society similar to that by the Information Technology (IT) sector in the past.

Any discussion about the future of medicine is incomplete without commenting upon Artificial Intelligence (AI) making deep inroads in all human endeavours. AI has been touted to revolutionize the healthcare industry globally and already is causing disruption in radiology, cancer diagnosis and treatment algorithms.

In India, it is expected that AI can augment the healthcare delivery and improve outcomes in a short to medium term. In combination with AI tools, the genomic services will have the potential to offer rapid diagnostics and personalized interventions to the patients in remotest parts of the country. It is conceivable in future that every Indian can have his/ her genome sequenced and receive personalized guidance and therapies. How quickly this would become a reality depends on the decrease in cost of genome sequencing and adaption of AI.

The ubiquitous presence of IT and ITES in India, combined with rise in demand of quality healthcare access is likely to allow the healthcare sector to be the major contributor of economic growth of the country. The healthcare sector, in addition to improving the health of the citizens has also exciting potential to create jobs, just as the IT sector has been doing in the last couple of decades. The combination of IT, AI, big data and the recently undertaken steps towards universal healthcare, India is clearly poised towards leading a revolution in improving the lives of her people. With a true integration of IT, genomics and AI, into the healthcare system, citizens can aspire for accessible quality health care and enable India to leap frog into the future as a healthy and developed nation.

Source : JRD TATA Memorial Lecture Book - ASSOCHAM





“EMERGING INDIAN LOGISTICS –EXPLORING OPPORTUNITY AND CHALLENGES”!

RABI NARAYAN PADHI
VICE PRESIDENT (SOUTH) - IIMM
rabin.padhi@gmail.com

Abstract : The logistics sector in India has today become an area of priority. One prime reason for the same stems from the reason that years of **high growth** in the Indian economy have resulted in a significant rise in the volume of **freight traffic moved**. This large volume of traffic has provided **for growth opportunities** in all facets of logistics including

1. Transportation,
2. Warehousing,
3. Freight Forwarding,
4. Express cargo delivery,
5. Container services,
6. Shipping services etc.

The growth path has also meant that increase demand is being placed on the sector to provide the solutions required for supporting future growth. Going forward it will not be wrong to say that the strength of the logistics sector is likely to be one of the key determinant of the pace of **future growth of the economy**. Various estimates put the market **size of the logistics sector** in India to be **between USD 90-125 billion**. Given that the Indian economy has grown to **over USD 1.73 trillion** these estimates may already be well below the actual size of the industry. Sources also estimate that the industry employs over **45 million people** and is growing at the **rate of 15% with sub-sector** growing at **even 30-40% per annum**.

Due to its current growth and its future growth potential the Indian logistics sector is viewed as one of the most attractive in the world. The paper is based on available literature and secondary data. The paper is divided in two parts. The first part deals with the **Opportunities** and second part on **logistics sector Challenges in India**.

Key Words : (Logistics, Growth, Opportunities, Challenges, Economy, Transportation)

INDIA'S LPI

	2014	2016
Overall LPI	54	35
The efficiency of customs and border management clearance	65	38
The quality of trade and transport infrastructure	58	36
The ease of arranging competitively priced shipments	44	39
The competence and quality of logistics services	52	32
The ability to track and trace consignments	57	33
The frequency with which shipments reach consignees within scheduled or expected delivery times	51	42

Source: World Bank report

Fast mover

India's performance in World Bank's 'ease of doing business' report

Indicator (Ranking)	2017	2018
Starting a business	155	156
Dealing with construction permits	185	181
Getting electricity	26	29
Registering property	138	154
Getting credit	44	29
Protecting minority investors	13	4
Paying taxes	172	119
Trading across borders	143	146
Enforcing contracts	172	164
Resolving insolvency	136	103
Overall ranking	130	100



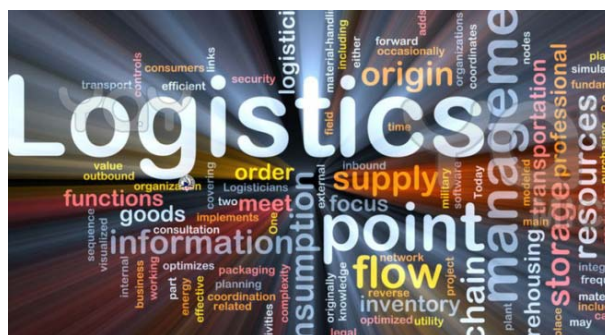
I. Introduction : In the rapid changing business scenario and corporate climate every organisation wants to win at the customers end.

India's logistics sector is coming of age. With its new found infrastructure status and the GST giving tailwinds, it is all set for transformation. In addition, there is a lot happening in favour of this sector, which has resulted in it being deemed a sunshine industry. During the last two years, India's position has progressed in the World Bank Logistics Performance Index (LPI), in terms of overall logistics performance from 54 in 2014 to 35 in 2016. The 2017-2018 Economic Survey also paints a promising future for the sector. Industry analysts also endorse such growth trends for logistics.

Ports	Inland waterways	Road	Rail	Air
<ul style="list-style-type: none"> High turnaround time of vessels Draft restrictions prevent big vessels berthing Delays in co-ordination between ports and the Customs authorities 	<ul style="list-style-type: none"> Limited infra to use extensive waterways network Poor hinterland connectivity and poor port and land-side infra Limited vessel size due to low draft of waterways 	<ul style="list-style-type: none"> Poor quality of roads and connectivity Stoppage of vehicles at border check posts No stringent requirement for starting a business Fragmented market players and intense competition 	<ul style="list-style-type: none"> Freight tariffs in India are among the highest in the world Rail freight lacks reliability and trackability Deficient in quality of operations, speed, and customer orientation 	<ul style="list-style-type: none"> Absence of integrated cargo infrastructure Need streamlining of Customs procedures in air cargo Need technological up-gradation of cargo handling processes

All this augurs well for the industry. It will not only stimulate job creation—a critical need for the nation—but also bring to the forefront the talent requirement of the industry in the coming years. As a result of all the investment-led transformation, the logistics sector in India is expected to provide employment to 13.9 million people, up from the current 10.9 million, over the next four years (2018-2022), making it the largest job-creator in the infrastructure space.

A key capability that would require focus is that of skills development. With the business rapidly formalising, logistics player are waking up to the reality of talent management, and are faced with an immediate imperative to embrace technology, acquire new and relevant skills, and invest in continuous learning for business growth. They are also facing challenges in attracting and retaining talent, including battling perception of logistics as a low-skills sector.



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apprenticeships in the logistics sector; this aims to train 3 lakh youths by 2020. Similarly, at the industry level, CII has also set up a Centre of Excellence in logistics and supply chain management, with enhancing the competitiveness of the Indian Industry through supply-chain and logistics excellence being the objective. While all these initiatives are steps in the right direction, more concerted effort is required of industry, academia, policy-makers and trade-bodies if the supply of skilled logistics resources is to be enhanced. Collaborative efforts by all stakeholders and interested parties would enable the development of a sustainable and thriving logistics sector that not just serves the nation's needs, but also will make India a global hub for logistics services.

If India needs to reap the benefits of the logistics revolution, it is has to undertake strategic investment, intervention and initiatives to build this sector and make it the largest infrastructure jobs engine for India. The day of reckoning for logistics is here, and betting big on this sector will surely translate into a large number of jobs for India.

II. Methodology : This paper aims at discussing some of the important issues relating to logistics supply chain management using cutting edge information technologies with possible references to India. The paper is based on available literature and secondary data. The paper is divided in two parts. The first part deals with the **Opportunities** and second part on emerging **logistics sector Challenges in India**.

III. Exploring Opportunities: The growth in the Indian economy in coming decade is likely to be driven by the increased activity in the manufacturing and retail sectors.

To enable these sectors to contribute effectively to India's growth the logistics sector will have to step up to provide value-enabling solutions for these sectors.

This would require action on three fronts:

1. Creating an environment for graduating the Indian logistics market to provide value propositions in logistics solutions
2. Increasing the capability of the Indian Logistics Industry to provide such solutions
3. Requiring Government and other regulatory mechanisms in the country to provide an enabling environment for value propositions in logistics services Due to decades of growth and increasing globalization of the Indian economy Indian entrepreneurs become active participants in

business strategy issues which

IV. Exploring Challenges: Challenges faced by the recent logistics industry in India. The most essential challenge faced by the industry today is insufficient integration of transport networks, information technology and warehousing & distribution facilities. Regulations exist at a number of different tiers, is imposed by national, regional and local authorities. However, the regulations differ from city to city, hindering the creation of national networks. Trained Manpower is essential both for the third party logistics sector as well as the manufacturing and retailing sectors, which is very weak at a practical level, i.e., IT, driving and warehouse as well as at a higher strategic level. The disorganized nature of the logistics sector in India, its perception as a manpower-heavy industry and lack of adequate training institutions has led to a shortfall in skilled management and client service personnel. There is a lack of IT standard, equipment and poor systems integration.

Poor facilities and management are the reason for high levels of loss, damage and deterioration of stock, mainly in the perishables sector. Part of the problem is insufficient specialist equipment, i.e. proper refrigerated storage and containers, but it is also partly down to lack of training. The practitioners and the academicians are now aware of the importance of logistics and supply chain; however the field is still under penetrated as far as research is concerned. It is essential to prioritize research and development so that the weaknesses in the industry can be taken care of and improved

V. Solutions to some of the challenges : Infrastructure is the backbone of every country's growth and prosperity and for the logistics industry to flourish special emphasis has to be on building world-class road networks, integrated rail corridors, modern cargo facilities at airports and creation of logistics parks which need to be given a status equivalent to Special Economic Zones.

VI. Future prospects : The logistics firms are moving from a traditional setup to the integration of IT and technology to their operations to reduce the costs incurred as well as to meet the service demands. The growth of the Indian logistics sector depends upon its soft infrastructure like education, training and policy framework as much as the hard infrastructure. To support India's fast paced economy growth of logistics industry is very essential. It is estimated that the Indian logistics industry will continue to show robust growth of 10-15% annually, leading the pace of growth of the economy at large.

The global economic outlook, indeed that of India is

expected to significantly improve as India Inc begins to tackle the economic downturn. With a new government many policies are expected to be implemented which will give a fresh impetus to India's growth engine particularly in the corporate and SME sector which in turn will expand demand for the logistics sector.

With the implementation of GST, the logistics companies, which are currently forced to set up many small warehouses across multiple cities can set up just a few, big warehouses region wise and can follow the hub-and-spoke model for freight movement from the warehouses to the different manufacturing plants, wholesale outlets, retail outlets and the various POS. This growth is backed by the boom in the e-commerce sector and expansionary policies of the FMCG firms.

This has increased the service geography of the logistics firms but they also have to meet the demands of quick delivery and tight service level agreements. The industry has moved from being just a service provider to the position which provides end to end supply chain solutions to their customers. Thus, all this has paved the way for further growth of Logistics and Warehousing industry in the coming years.

VII. Conclusion: The logistics industry will continue to be the focal point of strategy formulation, operational excellence and information technology to make maximum contribution in value creation for customers. **Globalization, consolidation, technology advancements and outsourcing** have only led to growth in the logistics services market and this industry will continue to evolve in the coming years.

This may include upgrading the macro logistics infrastructure to world class standards and by providing a facilitative role to the SME players in the logistics sector to improve their service level competitiveness.

Government initiatives like development of SEZs, logistics parks, infrastructure building, privatization of transport operations, implementing PPP models etc., will encourage private sector investment and lead to greater demand for logistics services. Moreover, growth of user industries like retail, telecom, consumer goods, automotive, pharmaceuticals, foods and beverages etc. notwithstanding the current economic slowdown will provide further impetus to **logistics services across sectors**.

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WTO UPDATE : WTO RULES AGAINST INDIA'S EXPORT SUBSIDIES: ALL YOU NEED TO KNOW

The WTO's dispute settlement panel ruled that India's export subsidy schemes, including the provision for special economic zones, violated core provisions of global trade norms.

HIGHLIGHTS

- WTO upheld claims made by US in the trade dispute case
- India has been asked to withdraw some export subsidy programmes
- It ruled that India's export subsidy schemes violate global trade norms

At a time when India is going through a period of slowdown, it faces another setback as the World Trade Organisation (WTO) ruled the country's domestic export subsidy programmes as illegal. The WTO's dispute settlement panel ruled that India's export subsidy schemes, including the provision for special economic zones, violated core provisions of global trade norms.

WTO RULING EXPLAINED : Upholding US's complaints in the case, the three-member dispute settlement panel comprising Jose Antonio S. Buencamino, Leora Blumberg, and Serge Pannatier rejected India's claims that it was exempted from prohibition on export subsidies under the special and differential treatment provisions of the WTO's Agreement on Subsidies & Countervailing Measures (SCM).

Some of the schemes that will be affected by the WTO's ruling include Merchandise Exports from India Scheme (MEIS), export oriented units (EOU) scheme and sector-specific schemes, including Electronics Hardware Technology Parks (EHTP) scheme and Bio-Technology Parks (BTP) scheme, Export Promotion Capital Goods (EPCG) scheme; and duty-free imports for Exporters Scheme.

The panel further ruled that India is not entitled to provide subsidies depending on export performance and said its per capita gross national product crossed \$1,000 per annum. It is worth noting that under Article 3.1 of the WTO's SCM agreement, all developing countries with gross per capita of \$1,000 per annum for three consecutive years are required to stop all export incentives. The US had earlier accused India of giving prohibited subsidies to Indian steel producers, pharmaceuticals, chemicals, information technology, textiles and apparel.

While the panel ruled in favour of US and urged India to withdraw the subsidies without delay. "Accordingly, we

recommend that India withdraw, without delay, the subsidies we have found to be inconsistent with Articles 3.1(a) and 3.2 of the SCM Agreement," the panel said. "We conclude that, to the extent the measures at issue are inconsistent with the SCM Agreement, India has nullified or impaired benefits accruing to the US under this agreement," it added.

While the panel upheld most of the claims made by the US, it rejected some points pertaining to subset of exemptions from customs duties and an exemption from excise duties.

WHAT NEXT?

The WTO dispute settlement panel has asked India to withdraw the concerned export subsidy schemes within a time period of 90 days from the adoption of the report. It also asked India to withdraw prohibited subsidies under the EOU/EHTP/BTP schemes, EPCG and MEIS, within a period of 120 days and SEZ scheme within 180 days. However, India has the right to challenge the ruling before the appellate body of the WTO dispute settlement mechanism with regards to export subsidy schemes. New Delhi has a month to appeal against the WTO's order.

On the other hand, India could rework the export incentives to comply with the WTO ruling, but experts indicate that any change to the export subsidies will impact traders and the government will have to immediately look at working out alternatives. Under the various schemes, domestic companies are currently receiving billions in subsidies on an annual basis. Withdrawing the subsidies may have a significant effect on the performance of such companies.

US-INDIA TRADE DISPUTE RECAP : Last year, the US had taken India to the WTO's over the issue of export subsidy schemes, claiming that they were hurting American companies. The US alleged that some subsidy programmes run by the Indian government were giving undue advantage to Indian businesses. The Donald Trump administration filed a case against India citing a violation of the SCM Agreement as India's gross national product per capita was over \$1,000.

While the government had earlier said that it would phase out the aged export subsidy programmes, no such scrapping has occurred. It has also come to light that New Delhi is already working on rolling out new schemes to replace the old programmes.

Source: www.indiatoday.in

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BRANCH NEWS

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BANGALORE BRANCH

6th and 7th December 2019 – Two days workshop: Indian Institute of Materials Management (IIMM), Bangalore Branch organized Two-Day workshop on “**Legal and Commercial Aspects of Purchasing**” at Hotel Regenta Palace, Bangalore. The sessions were handled by Dr. S. Chandrashekar, Sr. Faculty, Mr. H.R. Gowri Shankar, Sr. Faculty and Tax Consultant, Dr. C. Subbakrishna, Sr. Faculty, and Mr. M.S. Shankar Narayanan, Sr. Faculty. The sessions were highly interactive as both the Faculty and the participants engaged themselves in interesting and meaningful discussion. Around 20 participants attended from various sectors and we have received very good feedback.



Dr. Chandra Shekar Handling session - Two Days Workshop on 6th and 7th December 2019

21st December 2019 – Evening Lecture Program: Indian Institute of Materials Management, Bangalore, organized the Monthly Lecture Program for December 2019 on “**Supply Chain 4.0**” “**Your Role in the next Generation Digital Supply Chain**” in cooperation with the World Trade Centre, Bangalore at the WTC, Bangalore. The response was overwhelming.



A view of participants present on 21.12.2019 - Lecture Program



Prof. Vidya Sagar, handling session on Investment Planning - Lecture Program on 18.01.2020

Mr. B. Jayaraman, Branch Chairman welcomed the gathering and speaker. The Speaker Mr. Ramanathan Subramaniam, MBA, CISA, CRISC, General Manager – IT, John Distilleries Private Limited, Independent Consultant, RPA Business Analyst, enthralled the audience with his simple style of conveying the intricacies of the latest technological interventions in the SCM domain and involving them in discussions.

This has been one of the most well received Lecture programs in recent times with more than 140 SCM professionals in attendance. The feedback received from the participants is excellent

18th January 2020 – Evening Lecture Program: Indian Institute of Materials Management, Bangalore, organized the Monthly Lecture Program for January 2020 on “**Investment Planning**” “**Economic Downturn and Prudent Decision Making**” by Prof. Vidyasagar, Empaneled Master, Trainer & Consultant for ZED Scheme of Govt of India Resource Person of SEBI at Hotel Ajantha, M.G. Road Bangalore. Around 45 SCM professionals attended the program. The Lecture was well received for the speaker’s unique style of engaging the participants in the deliberations throughout the session. We have received very good feedback on the relevance of the topic and the delivery by the speaker.

CHANDIGARH BRANCH

The Indian Institute of Materials Management, Chandigarh has its annual Conclave & Award Ceremony at Hotel Redisson, Punjab on Friday, 27 December, 2019. More than 100 delegates from Haryana, Punjab, Chandigarh & Himachal Pradesh attended the Conclave.



Mr Arun Batra Chairman Chandigarh branch welcome the delegates and guests.

Mr. Sanjiv Gupta, head Sourcing, M& M, presented case study of M & M . Swaraj Division & emphasise the adoption of affordable digitalization technology.



Delegates from M & M, Swaraj Engines, B. E. L., T. B. R. L, Hero Cycles, SML ISUZU, N. P. C. F., M. G .Construction Co., NTC tiles and many other Private & Public sector and MSME companies participated in the Conclave.



Mr.S. K. Sharma Former National President IIMM has shared the importance of theme & how it is relevant in today's scenario. Mr V. K. Jain has highlighted how public procurement has been benefitted from digital tech. like GeM etc. Mr Sandeep Chugh, Director CAX Services, Chandigarh highlighted use of digital technology in product design to after sale service. Mr.T. K. Magazine Distinguish member IIMM spoke on green purchasing & shared how Green SCM can save the environment.

Mr.O. P. Longia FNP and Mr Atul Pathra Of QUINJI also shared their views on the theme.

Dr A. K. Saihpal discussed various aspects of SCM Transformation thorough Digitization in current economic scenario and how it can help in saving environment.

Awards

Public sector BEL Panchkula was given best company of the year 2019 award and its G. M. M.K. Changoiwala outstanding CEO award for the year 2019.

Magnus Steel Pvt Ltd has been given award best company in MSME category. CREATIVE SYSTEMS AWARD HAS GONE TO M/S NTC Panchkula,

Private sector best company award has been conferred on M. G Construction company,

Outstanding Materials Manager award in Public Sector has gone to Sh A. K. Puri, Life Achievement Award to Sh A. K. Mittal Sr member of Chandigarh branch and unique business practices has gone to GBP a renowned builders And Promoters.

All these awards have been given over the dinner hosted in the honour of all awardees in Hotel Radisson Zirakpur. Mr N. K. Sharma MLA Zirakpur and other dignitaries were present during the award ceremony.

HYDERABAD BRANCH

IIMM Hyderabad is going ahead with the concept of - Plan and Perform on all activities including "IIMM Hyderabad's Connect" at different symposiums / conferences specially to improve education platform, besides regularly doing monthly EC Meetings, Membership Drive, etc. Accordingly the following happenings are presented.

During December 2019: Successfully organised the exams to the students of GDMM, PGDMM Lateral entry, AICTE approved PGDMM / PGDSCM & L. Also completed Project Report Viva for Two PGDMM Students in compliance to letters from NHQ.

During January 2020: Keeping in view the various/ active developments in GST, organised the "Management Development Program - GST updates". The Trainer and Faculty is none other than our Life Member, Mr. SN Panigrahi, A Versatile Practitioner, An International Consultant-Corporate Trainer, Mentor & Author, GST Guru who trained Thousands of Participants & Consultant for Many Industries.

Mr. SN Panigrahi has covered the following topics in depth during his presentation: Recent Changes in E-Invoice, E-Waybill Restrictions, New Returns Filing, 10% ITC Restriction, Changes Required in ERP System & Many More on Industry Specific Analysis, How Logistic Sector Affected?, GST Impacts on Manufacturing, Simplified Schemes for Trading Sector, GST on Imports & Exports, etc...

The response for the above program by our Members, Industry Heads, SCM Executives, GST consultants / Practitioners was on very high side touching the figure of 62 participants. The professional feedback was very positive from the participants.

The program was conceived by Mr. DD Reddy, Vice Chairman. During the program, the welcome address was done by Mr. MD. Ziauddin, Chairman, the Program Summary was piloted by Mr. A. Preetam Kumar, NC Member, the concluding remarks and vote of thanks was performed by Ms. S. Suvarna, Hon'y. Secretary. Certificate of Participation was given to all Participants / Delegates through IIMM Hyderabad Office bearers, NC & EC Members present. Few Photos of the above program.



Mr. SN Panigrahi – commencing his presentation



Group photo with few participants

Our professional associates and supporters M/s. Gubba Cold Storage, have deputed their delegates to the above program and covered in their GUBBA NEWS, which gets circulated internationally besides in our country. This will help us to get much more opportunities to "Export consultancy MDPs", in times to come.

New Admissions of Students: Considering two dates (12th Jan and 9th Feb) stipulated by NHQ, the first spell of Admissions went well with 12 students and much more Admissions expected till end of second spell date.

IIMM Hyderabad Connect – Marketing strategy to improve specially Education and Membership through networking at different International symposiums / conferences. The details are:

On 21st and 22nd December 2019, Mr. Md. Ziauddin, Chairman and Mr. A. Preetam Kumar, NC Member have attended International Symposium on Recent Challenges in Engineering (ISRCE 2019) organised by Osmania University College of Engineering coupled with honouring of Former Osmania University Vice Chancellor Prof. S. Ramachandram. Organisers permitted IIMM Hyderabad to honour the Vice Chancellor and to address the gathering by Mr. Md. Ziauddin, Chairman on IIMM Education. During Networking discussions, experienced very positive response from honoured gathering (including foreign delegates, Heads of many Engineering colleges, students) on our IIMM Courses. The Alumni have shown keen interest to be our IIMM Education ambassadors.

From 27th to 29th December 2019, as a delegate through invitation from organisers (Institution of Engineers (India), Telangana state centre Hyderabad and also through Singareni Collieries Company Ltd.), Mr. Md. Ziauddin, Chairman has attended the National event – “34th Indian Engineering Congress 2019” at Novotel Hitec convention centre, Hyderabad. The Theme of the IEC: Societal Engineering-Imperatives for Nation Building.

Through continuous networking dialogues, spread IIMM Education and privileged to have a meet with Mr. GONG Ke, President of World Federation of Engineering Organisations.



Mr. Md. Ziauddin, Chairman with Mr. GONG Ke



3.3.3. On 16-01-2020: As a speaker, Mr. DD Reddy, Vice Chairman IIMM Hyderabad and GM Aurobindo Pharma along with his colleague Mr. Tushar Ghai (Life Member IIMM Hyderabad) as a panellist have attended the Pharma Connect 2020 - Pharma Supply Chain Conference in Mumbai.

Program was conducted by Surecom media New Delhi. It's a Asia's largest Pharma Supply Chain Conference. More than 200 delegates participated from all over India and other countries, from Pharma manufacturing companies, Logistics service providers, CHAs, transports, airline companies apart from Government agencies like airport cargo handling authorities, EXIM etc. Mr. DD Reddy spoke about Warehouse functions and factors to consider in Pharma manufacturing i.e. Premises, security, environment control, equipment, sanitation, receipt and storage procedure, packaging and shipping practices.

We are happy to make a mention here that, IIMM VP West - Mr. Surendra Deodher was also present at the above conference as a moderator for one of the panel discussions.



Mr. DD Reddy Vice Chairman, is speaking on his topic

With reference to our decided way forward concept / modalities i.e. Discuss, Plan, Execute, to overcome problems experienced and continue with corrected modalities, in coming month, we are planning to have a very apt MDP on: SCM TechTrends 2020, followed by Technovation conference, regular EC Meetings, "Contact IIMMians Hyderabad" (to address their issues, assist to complete their Project reports for getting their connected diplomas into their hands and to continue to develop Education platform and our students for improving their performance in the Examinations) and finally Membership drive. We always thank our MMR team at New Delhi under the nose of Chief Editor, for supporting us by publishing our Branch News and Technical Papers from IIMMians Hyderabad, regularly in MMRs.

Our Branch News, gets concluded with expectations of very good IIMM developmental decisions basing on already held business meet on 05-01-2020 and NC Meeting being held on 23-01-2020. **Long live our Republic Day – January 26th.** - Greetings to all IIMMians

JAMSHEDPUR BRANCH

New Year (2020) Celebration : On 01-Jan-2020 IIMM Jamshedpur celebrate New Year with cake cutting at IIMM office and during program Chairman Mr Shambhu Shekhar, Treasurer Mr Rajeev Kumar, Couse Co-Ordinator Mr G D Penda, Mr D N Jah and all student were present. The program started by welcomed all members and student through chairman, And chairman explain activity which will be done in Year-2020. Mr Rajeev Kumar presented last year (2019) activity.

Lecturer Meeting on "Cyber Crime" : On 3-jan-2020, Branch organise A lecture on Cyber Security Framework was organized by Indian Institute of Materials Management, Jamshedpur at Center for Excellence(CFE). The workshop was inaugurated by Chairman IIMM Mr. Shambhu Shekhar and the speaker was Mr. Jairaj Singh.



During her address, Mr. Jairaj Singh stressed upon the fact that information sector is more prone to the cyber threats and hence it becomes important to safeguard our cyberspace with anticipation of possible attacks. The speaker congratulated Department of I.T. Security Production for formulating Cyber Security Framework for DDP and also establishing Cyber Security Cells at

various levels to handle cyber security related issues. She further touched upon the requirement of creating the work force in all establishments in accordance with the nation's vision to become a dominant force in cyber space. Mr. Singh also explain how cyber-crime is very frequent in our day to day life with our lack of information, and how to reduce it. He also explain that what are the action required to safe the information in our electronic gadget.



Speaker Mr. Jairaj Singh



Mr. Rajeev Kumar who welcomed the listener of the program, explained that this Lecturer has been organized by the IIMM Jamshedpur to bring in synchronized approach for cyber security based on frame work document released by the I.T department in 2018. The framework which is in line with National policies & guidelines provides a common mechanism for all organizations to describe their current cyber security posture & the target area for cyber security, identify and prioritize opportunities for improvement and continuously assess progress towards the target area.

MUMBAI BRANCH

"National Summit on Public Procurement " held on 10th January 2020 at Hotel Hilton, Mumbai

IIMM Mumbai Branch organized the next edition of National Summit on Public Procurement on the 10th January 2020 at Hotel Hilton, Mumbai International Airport.



The inauguration of the event was done by the Chief Guest, Rear Admiral, Pradip Joshi of Indian Navy by lighting the ceremonial lamp. He was joined by other dignitaries like Vice Chairman IIMM Mumbai Branch, Mr Animesh Shah and Mr Sanat Kumar Executive Director - Chief MM services ONGC Delhi.

The Master of Ceremonies Mr Surendra Deodhar Vice President (west) IIMM, Head of Procurement, Reliance Life Sciences and past Chairman IIMM Mumbai Branch, set the ball rolling for a very interactive and highly informative session. The Summit was attended by 125 nos delegates and the Conference Hall was filled to capacity.



In his inaugural address, Rear Admiral Pradip Joshi covered the various facets of Public Procurement viz Transparency, Accountability and Effectiveness based on his long experience in the Indian Navy. Mr Animesh Shah, Vice Chairman, IIMM Mumbai Branch, in his opening remarks, spoke about the various initiatives taken by IIMM Mumbai Branch like conducting various

In -House Training Programs for various PSUs/ Government Undertakings and the setting up of a Consultancy wing at IIMM Mumbai Branch. He urged the delegates to make use of IIMM Mumbai Branch offerings.

The first Speaker, Mr Rahul Ravindran Director (law) Competition Commission of India gave an idea of the working in Competition Commission of India and spoke in detail about the newly introduced Toolkit for obtaining Competitive tenders. This session was followed by Mr H.K Sharma, Addl Director General (Supply) Ministry of Commerce & Industry, Govt of India and he covered the entire gamut of Legal Aspects of Public Procurement. The session which was highly interactive was that of Mr Hemant Kumar, Chief Technical Examiner (CTE) from CVC's Office, New Delhi. This was a Open House session on Vigilance and Public Procurement. CTE answered all the questions raised by delegates. His answers were crisp and had a touch of humour which the delegates appreciated. The next session on Best Practices in Inventory & Stores Management was taken by Mr T.L.Sharnagat, Vice president (Contracts & Procurement) & Chief Risk Officer of Mahanagar gas Limited.

Post Lunch, the first session was taken by Mr S.Suresh Kumar (IAS) Addl CEO GeM, New Delhi. He spoke on "latest developments in Procurement Through GeM Portal" His session was also very interactive and there was good participation from the delegates. Many delegates wanted to have a longer separate session on GeM procurement. After this, MSME Mumbai Office Representatives, Ms Vandana Wankhede (Investigator) and Ms Bhyagshree Sathe (Dy Director) spoke on MSME Procurement and latest developments. Mr D.P Sen, Executive Director (Contracts & Procurement) GAIL India limited spoke very well on the New Initiatives taken for "Ease of Business" in Procurement of Goods and Contracts at GAIL India. He was the only Speaker who covered his topic in a crisp manner within the time allotted.

The last session was the Panel discussion session where the topic was "Success Stories In Public Procurement" The Panel discussion was moderated by Mr Arun Mehta, Controller of Stores, Konkan Railway and the other Panel speakers were Mr U.Datta Executive Director(C&MM) Nuclear Power Corporation of India (NPCIL), Mr Sanat Kumar, Executive Director - Chief MM services, ONGC Corporate Materials, New Delhi and Mr A.Karmakar, Head of Procurement and Contracts, OPAL India Ltd.

The feedback from the delegates about the Summit was that it was very informative and very useful for their day to day work. The National Summit on Public Procurement was ended by a Vote of Thanks given by Mr Surendra Deodhar.

The program was coordinated by Mr A.R Sarkar with support from Mr Arun Mehta, Dr Shete & IIMM Office & Executive Committee members. The Main Sponsors for the event were ONGC, HPCL and Shah Bhogilal Jethalal & Bros.

PUNE BRANCH

An Evening Symposium on “**Leading your Team to Thrive**” was held on Friday, 10th January 2020 at the Branch Office. Mr. Krishnamurthy K, the Guest Speaker carry 27 years of experience across diverse Industries like Engineering, Automotive, Energy/Power Industry and expertise in Strategic Planning, Business Growth, Operational efficiency, Supply chain, Product Innovation.

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 lecture gave more insights about leadership skills and its attributes to implement the best practices in changing times at different levels for all the organizations. He also emphasized on leadership strengths giving relevant examples of influencers to help us understand those concepts. Further, he said, it is important to use emotional intelligence effectively to handle complex situations. There are various ways using power strategy and influencing people to achieve the goals but at the end trust element is the most important factor above all. A leader needs to have a global approach and sound business building acumen to drive the organization. Also, he should create more leaders around him so that they are well equipped and dynamic to lead and handle the challenging times for the organization. At the end few useful tips were discussed which are necessary and important for all the leaders in changing times. The program was attended by more than 30 members. After the presentation,

followed a session of questions & answers to clear the doubts and share the thoughts.

The Chairman, Mr. Terrence Fernandes felicitated the speaker Mr. Krishnamurthy K as a token of appreciation. The National Councillor, Mr. K.R. Nair concluded the session with a vote of thanks.



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- To secure a wider recognition of and promote the importance of efficient materials management in commercial and industrial undertakings.
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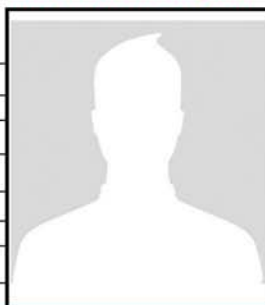
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Prepared by Sanjay-IIMM, Delhi Branch

EXECUTIVE HEALTH

HOW TO CONTROL HIGH BLOOD PRESSURE IN WINTER?

TOOBA MAHER

High Blood Pressure (BP) or Hypertension is one of the common problems faced by millions of people all over the world. The problem of High BP is even common in younger population now. If your blood pressure is consistently over 120/80 mmHg, it is advised to consult a cardiac specialist right away. High BP can lead to constricted arteries, restricted blood flow and stroke. Blood Pressure is generally higher in winters due to an inactive lifestyle, increased consumption of salt and constricted blood vessels because of a drop in temperatures. Following a healthy diet plays an important role in regulating blood pressure levels and a healthy heart.

How to maintain blood pressure -

Winter Vegetables to maintain Blood Pressure levels

Carrot : They are rich in potassium which relaxes the tension in your blood vessels and arteries. It neglects the ill-effects of sodium and reduces the risk of atherosclerosis and strokes.

Beetroot : It provides vitamin B which improves nerve function. Its antioxidants maintain blood pressure and cholesterol levels. Nitric oxide gas relaxes and dilates blood vessels.

Spinach : It contains potassium, folate, magnesium and lutein which prevents thickening of walls of arteries thus reduces heart attack risks.

Radish : They also contain potassium which regulates blood pressure levels. It lower your blood pressure and keep your blood flow in control. It has cooling effect on blood.

Methi : They contain good amount of soluble fibre which reduces cholesterol. Consume both methi leaves and seeds are good for health as they are very low on sodium. It should not be consumed daily as it can lower your blood pressure as well.

Tips to control high blood pressure

- Elderly persons are the most likely to cardiac conditions during winters. They should keep themselves extra warm to avoid stress on the heart.
- One should start with morning walks in winters to keep in good shape and provide exercise to the heart.
- Exercise regularly to keep the cardiovascular system well conditioned so the extra stress on heart during winters can be handled efficiently by the body.

- Avoid extreme exertion, heavy lifting.
- Dress in layers to keep yourself warm.
- Avoid alcohol and caffeine as they reduces body heat rapidly.
- Eat a well balanced diet consisting of variety of foods rich in nutrients which regulates blood pressure and maintain salt levels as well.

Thus following these beneficial winter tips will balance your blood pressure levels and will keep you healthy.

Source: krishijagran.com

How to Prevent High Blood Pressure

Summary : About 1 in 3 adults in the U.S. has high blood pressure, or hypertension, but many don't realize it. High blood pressure usually has no warning signs, yet it can lead to life-threatening conditions like heart attack or stroke. The good news is that you can often prevent or treat high blood pressure. Early diagnosis and simple, healthy changes can keep high blood pressure from seriously damaging your health.

What is blood pressure?

Blood pressure is the force of your blood pushing against the walls of your arteries. Each time your heart beats, it pumps blood into the arteries. Your blood pressure is highest when your heart beats, pumping the blood. This is called systolic pressure. When your heart is at rest, between beats, your blood pressure falls. This is called diastolic pressure.

Your blood pressure reading uses these two numbers. Usually the systolic number comes before or above the diastolic number.

How do I know if my blood pressure is high?

High blood pressure usually has no symptoms. So the only way to find out if you have high blood pressure is to get regular blood pressure checks from your health care provider. Your provider will use a gauge, a stethoscope or electronic sensor, and a blood pressure cuff. For most adults, blood pressure readings will be in one of four categories:

Normal blood pressure means

- Your systolic pressure is less than 120 **AND**
- Your diastolic pressure is less than 80

Prehypertension means

- Your systolic pressure is between 120-139 **OR**
- Your diastolic pressure is between 80-89

Stage 1 high blood pressure means

- Your systolic pressure is between 140-159 **OR**
- Your diastolic pressure is between 90-99

Stage 2 high blood pressure means

- Your systolic pressure is 160 or higher **OR**
- Your diastolic pressure is 100 or higher

For children and teens, the health care provider compares the blood pressure reading to what is normal for other kids who are the same age, height, and gender. People with diabetes or chronic kidney disease should keep their blood pressure below 130/80.

Why do I need to worry about prehypertension and high blood pressure?

Prehypertension means you're likely to end up with high blood pressure, unless you take steps to prevent it. When your blood pressure stays high over time, it causes the heart to pump harder and work overtime, possibly leading to serious health problems such as heart attack, stroke, heart failure, and kidney failure.

What are the different types of high blood pressure?

There are two main types of high blood pressure: primary and secondary high blood pressure.

- **Primary**, or essential, high blood pressure is the most common type of high blood pressure. For most people who get this kind of blood pressure, it develops over time as you get older.
- **Secondary** high blood pressure is caused by another medical condition or use of certain medicines. It usually gets better after you treat the cause or stop taking the medicines that are causing it.

Who is at risk for high blood pressure?

Anyone can develop high blood pressure, but there are certain factors that can increase your risk:

- **Age** - Blood pressure tends to rise with age
- **Race/Ethnicity** - High blood pressure is more common in African American adults
- **Weight** - People who are overweight or have obesity are more likely to develop prehypertension or high blood pressure
- **Gender** - Before age 55, men are more likely than women to develop high blood pressure. After age 55, women are more likely than men to develop it.
- **Lifestyle** - Certain lifestyle habits can raise your risk for high blood pressure, such as eating too much

sodium or not enough potassium, lack of exercise, drinking too much alcohol, and smoking.

- **Family history** - A family history of high blood pressure raises the risk of developing prehypertension or high blood pressure

How can I prevent high blood pressure?

You can help prevent high blood pressure by having a healthy lifestyle. This means

- **Eating a healthy diet.** To help manage your blood pressure, you should limit the amount of sodium (salt) that you eat, and increase the amount of potassium in your diet. It is also important to eat foods that are lower in fat, as well as plenty of fruits, vegetables, and whole grains. The DASH diet is an example of an eating plan that can help you to lower your blood pressure.
- **Getting regular exercise.** Exercise can help you maintain a healthy weight and lower your blood pressure. You should try to get moderate-intensity aerobic exercise at least 2 and a half hours per week, or vigorous-intensity aerobic exercise for 1 hour and 15 minutes per week. Aerobic exercise, such as brisk walking, is any exercise in which your heart beats harder and you use more oxygen than usual.
- **Being at a healthy weight.** Being overweight or having obesity increases your risk for high blood pressure. Maintaining a healthy weight can help you control high blood pressure and reduce your risk for other health problems.
- **Limiting alcohol.** Drinking too much alcohol can raise your blood pressure. It also adds extra calories, which may cause weight gain. Men should have no more than two drinks per day, and women only one.
- **Not smoking.** Cigarette smoking raises your blood pressure and puts you at higher risk for heart attack and stroke. If you do not smoke, do not start. If you do smoke, talk to your health care provider for help in finding the best way for you to quit.
- **Managing stress.** Learning how to relax and manage stress can improve your emotional and physical health and lower high blood pressure. Stress management techniques include exercising, listening to music, focusing on something calm or peaceful, and meditating.

If you already have high blood pressure, it is important to prevent it from getting worse or causing complications. You should get regular medical care and follow your prescribed treatment plan. Your plan will include healthy lifestyle habit recommendations and possibly medicines.

Source : National Heart, Lung, and Blood Institute

●●●

IIMM HEADQUARTERS AND BRANCHES

IIMM NHQ : Plot No. 102 & 104, Sector-15, Instl. Area, CBD Belapur, Navi Mumbai-400614. Tel.: 27561754 / 2756 5831, Fax : 022-27571022
E-mail NHQ : iimmmhq55@gmail.com, members@iimm.co.in E-mail Edu. Wing : iimmedu@iimm.co.in, Website : www.iimm.org

AHMEDABAD BRANCH

Indian Institute of Materials Management
C/o SaRaa Group of Companies
406, Kalasagar Shopping Hub,
Opp. Saibaba Temple, Near Sun N
Step Club, Sattadhar Cross Road,
Ghaliodia, Ahmedabad-380061, Gujarat
Cell: 91-9909996711
iimmahmedabad@gmail.com

ALWAR BRANCH

Indian Institute of Materials Management
15, Shopping Centre, Shanti Kunj,
Alwar - 301001 (Rajasthan)
Ph.: 09731245655/ 07877745655
Email: iimmalw@gmail.com

AURANGABAD BRANCH

Indian Institute of Materials Management
C/o. Training & Placement Cell
GF-19, JNEC Campus, CIDCO, N-6
Aurangabad - 431001. Ph : 0240-2473339
E-mail : iimmiau@rediffmail.com

BANGALORE BRANCH

Indian Institute of Materials Management
304, A-Wing, III Floor, Mittal Tower # 6
M G Road, Bangalore - 560001
Ph.: 080-25327251/52
E-mail : iimmbg@airtelmail.in

BHARUCH BRANCH

Indian Institute of Materials Management
303, Vinay Complex, Near Dudhdhara
Dairy, Old NH Highway # 8, Bhaurch
Ph.: 02642-283223
E-mail : iimmbharuch@gmail.com

BHILAI BRANCH

Indian Institute of Materials Management
Room No. 326, 3rd Floor, Ispat Bhawan,
Bhilai Steel Plant, Bhilai - 490001
Ph.: 0788-2892948/2222170

BHOPAL BRANCH

Indian Institute of Materials Management
4/9-B, Saket Nagar, Bhopal - 462024

BILASPUR BRANCH

Indian Institute of Materials Management
C/o. Gen. Manager (MM)
South Eastern Coalfields Ltd.,
Seepat Road, Bilaspur - 495006 (CG)
Ph.: 07752-241087/75014
E-mail : iimmbilaspur2015@gmail.com

BOKARO BRANCH

Indian Institute of Materials Management
Room No. B-237, Purchase Dept.,
Ispat Bhawan, Bokaro Steel City - 827001
Ph.: 06542-240263/280768
E-mail : iimmbokarobranch@gmail.com

BURNPUR BRANCH

Indian Institute of Materials Management
Matts. Dept. New Matts. Bldg.
ISCO, Burnpur Works
Burnpur - 713325 (West Bengal)
Tel: 0341-2240523/09434777116

CHANDIGARH BRANCH

Indian Institute of Materials Management
SCO 19-B, Swatik Vihar, Mansa Devi
Complex, Sector - 5, Panchkula - 134114
Ph.: 0172-2556646/4654205
E-mail : iimmchandigarh2@gmail.com

CHENNAI BRANCH

Indian Institute of Materials Management
4th Floor, Chateau D'Ampa, 110 (New #
37), Nelson Manickam Road
Aminjikarai, Chennai - 600029
Ph.: 044-23742195/23742750
E-mail : chn.iimm@gmail.com
iimmchennai@gmail.com

COCHIN BRANCH

Indian Institute of Materials Management
GCDA Shopping Complex, Kadavanthra
PO, Kochi - 682020 (Kerala)
Ph.: 0484-2203487/9400261874
E-mail : iimmkochi@bsnl.in

DEHRADUN BRANCH

Indian Institute of Materials Management
C/o. 30, Kalindi Enclave, Balliwala Chowk,
Lane No. 2, Dehradun - 248001 (U.K)
Ph.: 0135-2795486/9410397734

DHANBAD BRANCH

Indian Institute of Materials Management
O/o. GM (MM), B C C L, Koyla Bhawan
Koyla Nagar, Dhanbad - 826005
(Jharkhand) Cell # 09470595238
E-mail : iimmdhanbad@gmail.com

DURGAPUR BRANCH

Indian Institute of Materials Management
Office of ED (MM) 3rd Floor
Ispat Bhawan, SAIL, Durgapur Steel Plant
Durgapur - 713203
Tel: 0343-2574303

GANDHIDHAM BRANCH

Indian Institute of Materials Management
1,2,3, Plot # 356, Ward-12B, Tagore Road
Gandhidham -370201 (Kutch) Gujarat
Tel: 02836-231711/231745
E-mail : iimm_gim@rediffmail.com

GOA BRANCH

Indian Institute of Materials Management
S-6 & S7, 2nd Floor, Vasco Citicentre
Opp: Canara Bank, Swantantra Path
Vasco-da-Gama, Goa - 403802

GREATER NOIDA BRANCH

Indian Institute of Materials Management
B-193, Swam Nagri, Opp: J P Golf Course
Greater Noida - 201308
E-mail : iimmgreno@gmail.com

HARIDWAR BRANCH

Indian Institute of Materials Management
C/o. 97-B, Vigyan Kunj, Indian Institute of
Technology, Roorkee, Haridwar - 247667
E-mail : iimmaridwar@gmail.com

HOSUR BRANCH

Indian Institute of Materials Management
Opp: Hosur Bus Stand, By Pass Road
Above Axis Bank, Palaniyappa Building
Hosur - 635109 (TN) Tel # 04344-240448
E-mail : iimmhosur1@gmail.com

HUBLI BRANCH

Indian Institute of Materials Management
Karnataka Chamber of Commerce of
Industry Building, 1st Floor, Jayachamaraj
Nagar, Nr. Nehru Ground, Hubli - 580020
Tel: 0836-2264699/09972703336

HYDERABAD BRANCH

Indian Institute of Materials Management
4-8-68/A/21, G.D Enclave, 3rd Floor, Rang
Mahal Road, Putli Bowli, KOTI, Hyderabad-
500095. Email: iimm.hyd1719@gmail.com,
TEL: 040-24608952
Off: Timing: 4:30 pm to 8:30 pm)

INDORE BRANCH

Indian Institute of Materials Management
03, Rajmahal Colony, Ext Manik Bag Road,
Indore - 452007 (M.P)

JAIPUR BRANCH

Indian Institute of Materials Management
C/o. Mr. Purushottam Khandelwal
48, Mohan Nagar, Gopalpura Bypass,
Jaipur - 302018 Cell: 09799299157
E-mail : iimmjaipur1@gmail.com

JAMSHEDPUR BRANCH

Indian Institute of Materials Management
Room # 6, Russi Modi Centre for
Excellence Jubilee Road,
Jamshedpur - 831001
Ph.: 0657-2224670/2223530
E-mail : iimm_jsr@yahoo.co.in

JAMNAGAR BRANCH

Indian Institute of Materials Management
C/o. Mr. Jayesh Joshi
Riddhi Engineering Works
111, Madhav Complex,
Opp: DKV Collage, Jamnagar - 361008
0288-2750171 / 9824263869
riddhieng@yahoo.com

KANPUR BRANCH

Indian Institute of Materials Management
C/o. IGM Computer Academy
Mallick Complex, Nr. Rama Devi
Chauraha, G T Road, Kanpur - 208007
Ph.: 0512-2401291
iimmkanpurbranch@gmail.com

K G F BRANCH

Indian Institute of Materials Management

KOLKATA BRANCH

Indian Institute of Materials Management
8/B, Short Street, Kolkata - 700017
Ph.: 033-22876971/22834963
E-mail : iimmcal17@gmail.com

LUCKNOW BRANCH

Mr. P.K.Bajpai
Indian Institute of Materials Management
2nd Floor, Mishra Bhawan, Jurian Tola,
Lal Kuan, Lucknow - 226018
Ph.: 9415752999, Res. 05222638264

LUDHIANA BRANCH

Indian Institute of Materials Management
C/o. Guru Nanak Industrial Corporation
Adj. Hero Cycle Ltd.,
G T Road, Ludhiana - 141010 (Punjab)
Ph.: 0161-5212268
E-mail : iimmludhr@gmail.com

MUMBAI BRANCH

Indian Institute of Materials Management
2-A, Arianth Bldg, Above Bhandari Co-op
Bank Ltd., Goregaon (E) Mumbai - 400063
Ph.:022-26863376/26864528/26855645-46
E-mail : iimmbom@gmail.com

MUNDRA BRANCH

Indian Institute of Materials Management
C/o Pares Shatasya
DURLABH SINGH KHALSA
No. B/04/03, Sanudra Township, Old Port
Road, Distt. Kutch, Mundra - 370421
(KUTCHH). pares.shatasya@adani.com

MYSORE BRANCH

Indian Institute of Materials Management
Anubhav Udyog, K-64, Hootagalli Ind.
Area, Mysore - 570018 (Karnataka)
Ph.: 0821-4282124
E-mail : mysoreiimm@gmail.com

MANAGALORE BRANCH

Indian Institute of Materials Management
C/o. B Sandeep Naik, GM (Matts.)
MRPL, Materials Dept., PO: Kuthethur
Via: Katipalla, Mangalore - 575030. DK
Tel # 0824-2882203
Email: bsnaik@mrpl.co.in

NAGPUR BRANCH

Indian Institute of Materials Management
404, Suryakiran Complex-1, Bajaj Nagar,
Nr. VNIT Gate, Nagpur - 440010
Ph.: 0712-2229446
E-mail : iimmnagpur@gmail.com

NALCO NAGAR BRANCH

Indian Institute of Materials Management
Qtr. # C-352, Dist. Township, Nalco
Nagar - 759145 Dist: Angul, Orissa
Cell: 09437081126
Email: snbghar@nalcoindia.co.in

NASIK BRANCH

Indian Institute of Materials Management
1, Parag Bldg, Patel Lane # 4
College Road, Nasik - 422005
Ph.: 0253-2314206
E-mail : iim_nsk@bsnl.in

NEW DELHI BRANCH

Indian Institute of Materials Management
U-135, Vikash Marg, Shakrapur
Near Laxmi Nagar Metro Stn, Delhi - 110092
011-22464969/ 22466089/ 9818664267
E-mail : iimm1delhi@gmail.com

PUNE BRANCH

Indian Institute of Materials Management
Pratibha Towers, Plot # 22, Old Pune
Mumbai Road, CTS # 15/2, Above TVS
Showroom, Wakdevadi, Pune - 411003
Ph.: 7276010854
E-mail : iimmpune1@gmail.com

RAE BARELI BRANCH

Indian Institute of Materials Management
497, Near CMO Office, Jail Road,
Rae Bareilly -229001
iimmrbl@yahoo.com, iimmrbl@gmail.com

RANCHI BRANCH

Indian Institute of Materials Management
Gen Manager (MM) Office, Central
Coalfields Ltd., Darbhanga House,
Ranchi - 834001
Tel.: 0651-2360716/2360198
E-mail : rajesh0021@yahoo.com

ROURKELA BRANCH

Indian Institute of Materials Management
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 Matts, 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
Thiruvananthapuram - 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 : iimmbvd@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
Vithal Udyog Nagar - 388121
Tel: 02692-230440/ 09825028050
Email: harshad.champs@gmail.com



CRIMM conducted "Six Sigma Green Belt Certification Programme" amongst PGDM students at ABBS, Bangalore with whom CRIMM had signed MoU for conducting joint research initiatives. Fifteen students were awarded six sigma green belt certification at Bangalore on 25th January 2020 at ABBS Bangalore auditorium.

In the picture: Dr Goutam Sengupta, Program Director and Joint Chairman CRIMM, Dr Subbakrishnan Former National President IIMM, Pachamuthu Sengottaiyan Vice Chairman IIMM Bangalore Branch and Dr. Madhumita Chatterji, Director PGDM, ABBS Bangalore .

BRANCH ACTIVITIES



BANGALORE BRANCH : Mr. Ramanathan Subramaniam, GM-IT -JDL handling session - Lecture program on 21.12.2019 at WTC Seminar Hall



CHANDIGARH BRANCH :
Lighting of Lamp by Dignitaries



HYDERABAD BRANCH : Mr. SN Panigrahi was felicitated by Team IIMM Hyderabad



JAMSHEDPUR BRANCH :
New Year Celebrations



MUMBAI BRANCH : Lighting of Lamp by Dignitaries



PUNE BRANCH : Evening Programme



Materials Management Courses



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JANUARY
2020
SESSION

भारतीय सामग्री प्रबंधन संस्थान

Indian Institute of Materials Management

Entrance Test – 9th February 2020 (PGDMM/PGDSCM&L)

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2	Post Graduate Diploma in SCM & Logistics	AICTE	Graduate in any discipline from any Recognized University	2 Years
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4	Professional Diploma in Public Procurement	World Bank	Graduate in any discipline or Diploma Holders	6 Months
5	International Diploma in Purchasing and SCM	ITC – Geneva	3 Years Degree + 2 Years of Relevant Experience	18 Month Modular Prog.
6	Professional Diploma in Stores Management	IIMM	10+2 with 2 Years Exp. Or Degree in any discipline	2 Semesters
7	Professional Diploma in International Trade	IIMM	10+2 with 2 Years Exp. Or Degree in any discipline	2 Semesters

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Contact Us
Ph: 022-27571022,
www.iimm.org
iimmedu@iimm.co.in

IIMM - National Headquarters
(Education Wing)
CBD Belapur, Navi Mumbai



8452861005

