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MATERIALS MANAGEMENT REVIEW



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Eminence Awards 2026 & Felicitation Ceremony Organized by IIMM Kolkata Branch



**Lighting of the Ceremonial Lamp by Distinguished Dignitaries
on 23 May 2026 in Kolkata**

– Right to Left: Mr. Animesh Chattopadhyay, Chairman IIMM Kolkata Branch,
Mr. Pankaj Panchbhai, NS&T-IIMM, Swami Sarvottamananda,
Vice Chancellor- Ramkrishna Mission, Mr. P.M Biddappa, National President-IIMM,
Mr. R K Rastogi, Senior Vice President-IIMM, Mr. Pradip Kumar, VP East-IIMM,
Mr. Koushik Roy, Immediate Past Chairman, IIMM Kolkata Branch.

Indian Institute of Materials Management (IIMM) Kolkata Branch proudly Presents the Grand IIMM Eminence Awards 2026 & Felicitation Ceremony



Dignitaries - Left to Right:

Mr P R Basu-MD Aliaxis India, Dr. Jayanta Basu, Environmenlist, Mr R.K. Rastogi, Sr VP IIMM, Mr. Animesh Chattopadhyay Chairman IIMM Kolkata Branch, Ms. Mantu Murmu, 1st Indian Master Table Tennis Champion, Ms. Dola Banerjee, Olympiad, Shri Swami Sarvottamananda, VC Ramakrishna Mission Belur Math, Mr Biddappa National President-IIMM, Mr Pankaj Panchbhai NS&T-IIMM, Mr. Pradip Kumar VP East and Mr. J. Basak Treasurer IIMM Kolkata Branch



208th National Council Meeting Hosted by IIMM Kolkata Branch on 24th May 2026.



From the Desk of National President & Editor in Chief



Greetings from your National President!!!

Dear All Members of IIMM,

India's supply chain and logistics sector witnessed several important developments during 2026, reinforcing the country's ambition to become a global manufacturing and logistics hub. Despite global uncertainties arising from geopolitical tensions, rising fuel prices, and disruptions in international trade routes, India's supply chain ecosystem has demonstrated remarkable resilience and adaptability. One of the most significant developments has been the continued expansion of logistics infrastructure across the country. Government initiatives under PM Gati Shakti, multimodal logistics parks, dedicated freight corridors, and port modernization programs are steadily improving connectivity and reducing logistics costs. Industry leaders have emphasized that logistics efficiency is becoming a critical driver of India's economic transformation and global competitiveness.

The warehousing sector also recorded impressive growth during the first quarter of 2026. Demand for modern warehouses and distribution centers increased significantly, driven by manufacturing companies, e-commerce businesses, and third-party logistics providers. This growth highlights the increasing importance of inventory optimization, faster deliveries, and regional distribution networks in modern supply chain management. Technology adoption continues to reshape supply chain operations across India. Artificial Intelligence (AI), automation, data analytics, and digital platforms are being increasingly deployed to improve visibility, forecasting, inventory management, and operational efficiency. Organizations are investing in smart supply chain solutions to build more agile and resilient operations capable of responding to changing market conditions.

At the same time, global geopolitical developments have highlighted the importance of supply chain diversification. Policymakers and industry experts have advised businesses to reduce dependence on single-source suppliers and develop alternative sourcing strategies. The evolving global trade environment, including concerns over critical minerals, electronics components, and energy supplies, has reinforced the need for resilient and diversified supply chains. Another notable trend is the government's focus on strengthening domestic manufacturing capabilities. Recent policy discussions have emphasized reducing import dependence in strategic sectors while encouraging local production through targeted incentives and infrastructure support. Such measures are expected to create more robust domestic supply networks and enhance India's position in global value chains.

The logistics and air cargo sector is also preparing for significant expansion, supported by growing trade volumes, improved infrastructure, and increasing digitalization. Industry events and stakeholder collaborations are fostering innovation and knowledge sharing, helping businesses prepare for future supply chain challenges and opportunities. As India progresses toward its vision of becoming a developed economy by 2047, supply chain management will play an increasingly strategic role. The developments witnessed during 2026 demonstrate that India's supply chain ecosystem is evolving beyond traditional transportation and warehousing functions into a technology-driven, resilient, and globally integrated network.

The future of supply chain management in India lies in greater collaboration, digital transformation, sustainability, and risk management. Organizations that embrace these principles will be better positioned to navigate uncertainties and capitalize on emerging opportunities in an increasingly interconnected global economy. Recently launching of the Logistics Port Performance Index (LPPI) for FY 2024-25 by the Ministry of Ports, Shipping and Waterways marks a transformative step towards creating a world-class maritime ecosystem that is efficient, transparent, and globally competitive. The Logistics Port Performance Index introduces a culture of measurement, transparency, and continuous improvement that is essential for sustained growth. Its successful implementation will not only enhance the competitiveness of Indian ports but also strengthen India's position in global trade and logistics networks.

As India aspires to become a leading maritime nation, benchmarking and accountability will be as important as infrastructure investments. The launch of the LPPI is therefore more than an administrative reform—it is a strategic milestone in India's journey towards becoming a resilient, efficient, and globally respected maritime power. By embracing performance-driven governance and digital transformation, India is laying the foundation for a future-ready logistics ecosystem capable of supporting the nation's ambitious economic aspirations.

Thanking you and wishing all the best.

A handwritten signature in black ink, appearing to read 'P.M. Biddappa'.

P.M. BIDDAPPA
NATIONAL PRESIDENT

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June 2026

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FOOD SUPPLY CHAINS IN THE INFORMAL SECTOR – AN OVERVIEW

**PREM NARAYAN, IRSSLIFE FELLOW
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email:premn2011@gmail.com**

Introduction: The Informal food sector is playing an important role in the national economy of India. An informal economy is the part of any economy i.e. neither taxed nor monitored by any form of government. Although, the informal sector makes up a significant portion of the economy in developing countries, it is sometime stigmatized and unmanageable.

The food supply chain in the informal sector refers to the network of activities and processes involved in producing, processing, distributing and selling food outside the formal and regulated market systems. In most of Asian countries, the informal food supply chain has dualistic structure with majority of the market share being traditional and small quantum being modern. As such, informal food supply chains complemented the formal food industry, its networks and was an unofficial part of food supply security with “tolerable” health risks.

Informal food supply chains existed since humans moved from being hunter-gathers to farming, grazing animals and producing food. Excess from daily harvests from market gardens are traded or sold to neighbours and the general community even today, since the produce or products are freshly harvested and affordable.

Informal food sector is characterized by Small Scale Venders, Local Markets/ Traditional Market and street food, small food hotel, tea stall and unregistered or non-compliant enterprises. It plays an important socio economic role in meeting food and nutritional requirements of consumers at less prices to the lower and middle income people. Homemade and street foods are described as wide range of ready to eat foods, usually sold by venders and hawkers in the streets. Women are more often active in informal employment than men. The informal sector is playing the vital role in country of the diverse culinary preferences of the population.

The Law of food safety and quality leaves out the conditions and mechanism on managing and ensuring safety, quality, sanitation and literacy of food in all steps of food processing to take the health and safety of consumers as well as guarantee fair trade in food industries.

2.0 Main sectors of informal supply chains: The main sectors of food supply chain are sources, intermediaries and Retail. The sources include production (farming) and wildcatch. Intermediaries include farm produce collector, wholesaler, Retailer and market vendor. Whereas Retail includes wet market, supermarket and convenience stores. Risk management of food quality and safety issues are required to be addressed at

every stage of these sectors to achieve overall objectives and success. Easing bank loans, use of agriculture technology, online business and directly buying from farmers may improve food safety and quality in informal sector.

3.0 Market chains types:

3.1 Wet and Dry market chains: Fresh produce sales locations were later referred to as “Wet” markets as ice used to cool products which wet the floors as well.

“Dry” section of the market sold sauces, and “dry” produce eg. Garlic, onions, potatoes, etc which do not require ice to be used.

3.2 Modern market chains: The modern market chain relies on the formal flow of information and guarantees stable supply through contact farming. The main difference between the traditional and modern chain is highlighted by high quality products that are supplied to modern retail channels such as supermarkets and exports. Food safety and traceability, quality assurance and freshness are the primary attributes that set these products apart to attract higher income consumer. To achieve these attributes, the modern chains took a more coordinated approach to procurement, utilizing contract farming or other organizational structures to manage production and to transfer technologies and knowledge. Agribusinesses as modern suppliers link smallholder farmers to modern supermarkets by setting up a network of farmers and investing in local pre-processing and packaging operations.

4.0 Challenges in informal food supply chain:

(i) **Lack of standardization:** The absence of standardized practices in the informal sector poses a risk to food safety and quality and to conduct food safety practice.

(ii) **Limited regulatory oversight:** The regulatory oversight is limited in the informal sector, make it challenging to enforce and ensuring adherence to safety standards.

(iii) **Infrastructure issues:** Inadequate infrastructure, including storage and transportation facilities, hampers the maintenance of food quality throughout the supply chain. Professional know-how required on handling, transporting and managing infrastructure.

4.1 Common Challenges and recommendations in food supply chains:

Main challenges and recommendations in a typical food supply chain are summarized in the table given below:

Key areas	Challenges	Recommendations
Production	Packaging, sorting, old equipments, lack of mechanization, lack of raw material & knowledge, funding,	Standardization of products, setting of new markets, role of regulatory oversight agencies, training & capacity building to farmers – technical assistance, availability of raw material
Warehousing	Storage, infrastructure, material handling equipments, temperature control, lack of trained manpower	Equip warehouse with required technologies, effective inhouse logistics mechanism, cold storage facility, tracking system, modern assembly lines, temperature control.
Logistics	Lack of transportation, information flow, planning, road network, training & awareness program	Remove multilayered-middlemen from the entire supply chain, ensure accessible and affordable logistics system including transportation and warehousing facility in the entire supply chain, clustering & cooperatives by group of small farmers.

4.2 Challenges to Improve “Food Safety” & “Quality” of Food Supply:

- Making the transition from traditional chain towards a modern chain very difficult because improved production management means a higher level of attention and care from highly skilled farmers and workers is needed.
- The production of vegetables in the traditional chain remains significantly cheaper than in the modern one because quality monitoring and assurance by the modern chain add to the cost of production and distribution, while the use of chemicals by smallholders in the traditional chain can reduce labour intensity and costs.
- On top of this, consumers do not perceive the benefits of higher quality and safer products and still prefer inspecting the products themselves.



i) Food safety and Quality: Training and education can raise awareness about the importance of maintaining high standards of food safety and quality in the informal food supply sector.

ii) Compliance with regulations: Many informal food businesses may not be fully aware or compliant with existing regulations. Structuring awareness helps them understand and adhere to relevant food safety and hygiene standards.

iii) Entrepreneurial Development: Education and training can empower individuals with the skill and knowledge needed to run their businesses more efficiently.

iv) Market access and expansion: Awareness program can facilitate better market access for informal food suppliers by helping them understand market demands, consumer preferences and supply chain dynamics.

v) Community health and Nutrition: Structured awareness programs can highlight the nutritional value of different food products, promoting healthier eating habits within communities.

vi) Technology Adoption: Awareness program can introduce and promote the use of technology that can help in improving efficiency, traceability and communication within supply chain.

vii) Sustainability Practices: Training initiatives can promote sustainable agricultural and food production practices, helping to minimize the environmental impact of the informal food supply sector.

viii) Social Equity and Inclusion: Education and training can contribute to social equity by providing opportunities for marginalized groups, such as women and minority communities, to participate more actively in the informal food supply sector.

ix) Consumer empowerment: Targeted consumer awareness programs empower individuals to make choices aligned with their values, such as supporting local businesses, promoting sustainable practices and making informed decisions about their food consumption.

x) Community Engagement: Training and awareness program can encourage local communities to support &

5.0 Importance of Education and Training in informal food supply chains:

patronize businesses by contributing to community development.

xi) Business Development: Education and training can equip individuals in the informal food supply sector with essential business skills, such as marketing, financial management and customer service.

6.0 Recommended Actions to Improve Food Safety and Quality:

- i. **Promoting Awareness:** Implement awareness campaigns to educate both vendors and consumers about the importance of food safety and quality.
- ii. **Capacity Building:** Provide training and capacity-building programs for vendors to enhance their understanding of best practices in food handling and storage. Train producers in agricultural practices and in technical and health standards.
- iii. **Regulatory Strengthening:** Collaborate with relevant stakeholders to strengthen regulatory frameworks, ensuring better oversight and enforcement in the informal food sector.
- iv. **Infrastructure Development:** Invest in the development of infrastructure, including storage and transportation facilities.
- v. **Providing appropriate area to the sale of food:** Maintain food safety and public hygiene safeguard environment to prevent contamination of food.
- vi. **Enhance Food Quality:** Promote the availability of wide range of fresh and healthy products, Develop urban and Peri-urban food production with the direct investment of community.
- vii. **Traceability:** Developing a traceability process for the production of fruits and vegetables.
- viii. **Policy initiatives:** Making policies to support the production of organic farms such a free advice and free licensing of GAP and organic farm standards.

7.0 Way forward: Informal networks in food supply and retail, low-cost transportation / distribution, processing and agricultural production provide a base source of nutritious food. Often large population in Asia who depend on food sourced from small holder growers providing affordable food and rural income.

As such, stabilizing yields, building capacity while managing crops, together with improved logistics / transport infrastructure, promoting productivity and sustainability are vital to local producers / farmers especially the indigenous and rural people in Asia. There is an urgent need to set up knowledge-based governance and inter-connectivity to ensure resilient and affordable, socio-culturally inclusive access to food supply.

Incentives, training, education, media attention and the use of available handheld technologies should be included in the strategic goal achievements for overall success of the informal food supply sector.



Indian Institute of Materials Management

MISSION

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

OBJECTIVE

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

CODE OF ETHICS

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

FROM GREEN HYDROGEN TO GREEN STEEL: FORGING A SUSTAINABLE FUTURE: ALIGNING TECHNOLOGY, POLICY, AND INVESTMENT TO ENABLE A NET-ZERO INDUSTRIAL ECOSYSTEM



"Transforming Iron Will into Green Steel: Where Innovation Meets Sustainability"

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1 . Introduction : The steel industry accounts for nearly **79% of global CO emissions**, with **~1.95 billion tonnes** of crude steel produced in 2022, of which **~70%** came from carbon-intensive BF-BOF routes emitting **1.82.0 tCO per tonne of steel**. As hydrogen matures into a core pillar of the global energy transition by 2026, **hydrogen-based Direct Reduced Iron (H-DRI)** has emerged as a transformative pathway, enabling near-zero-carbon primary steelmaking without compromising productivity, supported by live industrial deployments and verified global data.

India, the world's second-largest steel producer, contributed **~125 Mt in 2022** (**~7% of global output**) but remains more carbon-intensive, emitting **~2.32.6 tCO per tonne of steel** due to coal-based BF-BOF and DRI routes. With a target of **300 Mt capacity by 2030** and **net-zero by 2070**, incremental efficiency gains are insufficient, making **hydrogen-based DRI and deep process transformation strategically unavoidable** to accelerate the Green Steel transition.

This paper evaluates hydrogen production pathways, cost structures, deployment challenges, and live industrial applications, with emphasis on DRI processes and hydrogen as a clean industrial fuel.

2. Technological Framework: From Conventional to Green Steel

"From Ore to Steel, Hydrogen Heals Forging Tomorrow's Sustainable Future Today"

2.1 Conventional Steel Production Methods

2.1.1 Blast Furnace Route

The traditional blast furnace route dominates global steel production, accounting for approximately 70% of total output. This process involves:

Step 1: Iron Ore Preparation : Iron ore fines are agglomerated into **sinter or pellets** to ensure permeability and uniform reaction in the blast furnace.

Step 2: Coke Production (Carbonization) :

Metallurgical coal undergoes **carbonization** in coke ovens at **1,000-1,100 °C** in the absence of oxygen:

Coal $\xrightarrow{1000-1100^{\circ}C}$ **Coke (C) + H₂ + CH₄ + tar vapors**
Coke provides **mechanical strength, heat, and carbon for reduction**.

Step 3: Coke Combustion & Carbon Monoxide Formation (Heat Generation)

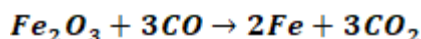
Primary combustion (at tuyeres):
C + O₂ → CO₂ (+ heat)

Secondary reaction (Boudouard reaction):
CO₂ + C → 2CO

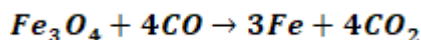
These reactions generate temperatures exceeding **1,500 °C** and produce **carbon monoxide (CO)**, the principal reducing gas.

Step 4: Iron Ore Reduction (Main Reduction Reactions)

Hematite Reduction (FeO):



Magnetite Reduction (FeO):



Molten iron (hot metal) is produced, while **CO is continuously released**.

Step 5: Steelmaking in Basic Oxygen Furnace (BOF)

Molten iron is transferred to the BOF, where **pure oxygen** removes excess carbon and impurities: BOF refines molten iron (4% C) to steel (0.04-2% C) (decarburization)



(CO is dominant due to limited oxygen availability inside the melt)

Producing **crude steel** with controlled carbon content.

The BFBOF route emits **~1.82.2 tonnes of CO per tonne of crude steel**, as **carbon is chemically bound into every major reaction step**.

This process, while highly efficient in terms of productivity and economies of scale, is **inherently carbon-intensive** due to its reliance on carbon-based reductants.

2.1.2 Electric Arc Furnace Route

Electric arc furnaces (EAF) primarily use scrap steel as feedstock, melting it using electrical energy. While EAF routes produce significantly lower emissions per tonne of steel (approximately 0.4-0.6 tonnes CO), they depend on scrap availability and quality. The global scrap supply cannot meet increasing steel demand, necessitating primary steelmaking from iron ore.

2.2 Steel Production Technologies - Hydrogen as a Game-Changing Solution

Hydrogen serves dual critical functions in sustainable steel production. First, as a reducing agent in DRI processes, hydrogen strips oxygen from iron ore without carbon emissions, producing only water vapor as a byproduct. Second, hydrogen functions as a clean fuel for heating and energy generation throughout steel mills, replacing fossil fuels across the value chain.

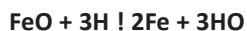
2.2.1 Hydrogen-Based Direct Reduction

The hydrogen direct reduction process represents the most promising pathway for green steel production. This technology replaces carbon monoxide with hydrogen as the reducing agent:

Process Steps:

Step 1: Hydrogen Production - Renewable electricity powers electrolyzers that split water molecules into hydrogen and oxygen.

Step 2: Direct Reduction - Iron ore pellets or lumps enter shaft furnaces or fluidized bed reactors where hydrogen reduces iron oxides to metallic iron (direct reduced iron or DRI).



Instead of producing CO, this reaction generates water vapor as the only byproduct. The process operates at lower temperatures (800-1000°C) compared to blast furnaces, offering additional energy efficiency benefits.

Step 3: Electric Melting - DRI transfers to electric arc furnaces for melting and refining into finished steel. H-DRI produces **solid sponge iron** at 800-1000°C, NOT molten metal.

Steel production requires **liquid steel** at ~1600°C for: Casting, Removing residual impurities & Alloying.

Step 4: Water Recycling - Water vapor produced during reduction can be condensed and reused for hydrogen production, or other purposes creating a circular system.

2.2.2 Hybrid Technologies

Several intermediate technologies bridge the gap between conventional and fully green steel:

- ✓ **Hydrogen-Natural Gas Blending:** Current DRI plants using natural gas can incorporate increasing proportions of hydrogen, progressively reducing carbon emissions while maintaining operational stability.
- ✓ **Top Gas Recycling:** Advanced blast furnaces with carbon capture can reduce emissions by 20-30%, serving as transitional solutions.
- ✓ **Molten Oxide Electrolysis:** Emerging technology directly electrolyzes iron ore at high temperatures, producing pure iron and oxygen without any carbon involvement.

2. Hydrogen Generation Methods

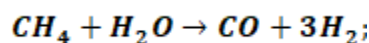
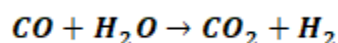
Hydrogen production is categorized by carbon intensity: **Grey**, including Steam Methane Reforming (SMR), which uses natural gas, Coal Gasification, which converts coal into syngas with high emissions, while **Blue** adds carbon capture (CCS) to these processes to reduce their footprint. **Green** hydrogen is the zero-emission gold standard, produced by splitting water via renewable-powered electrolysis, **Biomass Gasification**, using Organic matter (crop waste, wood, biogas) and **Turquoise** offers a bridge by using methane pyrolysis to create hydrogen and solid carbon instead of CO₂.



2.1 Grey Hydrogen (High-Carbon Fossil Hydrogen)

2.1.1. Steam Methane Reforming (SMR)

Steam Methane Reforming (SMR) remains the **dominant hydrogen production pathway**, supplying **~75-80% of global hydrogen demand**, primarily for refining, fertilizers, and chemicals. The process reforms natural gas with high-temperature steam over a catalyst:

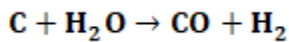
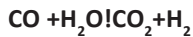


Globally, SMR hydrogen is produced at **\$1.002.50/kg H**, (low cost) with an energy efficiency of **65-75%**, but emits **912 kg CO per kg H**, making it carbon-intensive.

In **India**, SMR dominates hydrogen production (**~67 million tonnes annually**), largely consumed by **refineries and fertilizer plants**, with costs typically **\$1.22.0/kg H** due to regulated natural gas pricing but **higher indirect emissions** from gas imports and upstream methane leakage.

2.1.2 Coal Gasification

Coal gasification converts coal into synthesis gas (syngas) containing hydrogen and carbon monoxide through high-temperature reactions with steam:



Globally, coal gasification produces hydrogen at \$1.202.80/kg H₂, with relatively low energy efficiency (45-60%) and the highest carbon intensity among major hydrogen pathways, emitting 1820 kg CO₂ per kg H₂ (significantly higher than SMR) **Highest carbon intensity** among all hydrogen pathways.

This route dominates in coal-abundant economies, particularly China, which generates ~60-65% of its hydrogen via coal gasification, primarily for steel, chemicals, and ammonia.

In India, coal gasification is strategically promoted due to abundant domestic coal reserves (>330 billion tonnes) and energy security concerns. India currently produces ~15-20% of its hydrogen via coal-based routes, mainly in fertilizer plants, refineries, and proposed coal-to-chemicals projects.

However, India's coal has high ash content (30-40%), increasing gasification complexity, water consumption, and emissions, pushing effective CO₂ intensity beyond global averages.

2.2. Blue Hydrogen

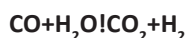
Blue Hydrogen is produced using the same fossil-fuel-based processes as Grey Hydrogen primarily **Steam Methane Reforming (SMR)** but is integrated with **Carbon Capture and Storage (CCS)** technology to trap and store up to 95% of the generated CO₂ underground.

The chemical process occurs in two primary stages:

1. **Reforming Stage:** Methane reacts with steam under high pressure and temperature (700-1,100°C) in the presence of a nickel catalyst.



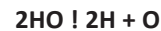
2. **Water-Gas Shift Reaction:** To increase hydrogen yield, the carbon monoxide produced is reacted with more steam.



In the Blue Hydrogen method, the resulting CO₂ from the second equation is captured and compressed for industrial use or geological sequestration, preventing it from entering the atmosphere.

2.3 Green Hydrogen - Water Electrolysis

Electrolysis splits water molecules using electricity, producing pure hydrogen and oxygen:



Production Cost: \$3.00-7.50/kg H₂ (heavily dependent on electricity costs)

Carbon Intensity: 0-1 kg CO₂/kg H₂ (when powered by renewables)

Efficiency: 60-80% (improving with advanced technologies)

Three primary electrolysis technologies exist:

- ✓ **Alkaline Electrolyzers:** Mature technology, 60-70% efficiency, capital cost \$500-1,400/kW
- ✓ **Proton Exchange Membrane (PEM):** Higher efficiency (65-80%), faster response times, capital cost \$1,100-1,800/kW
- ✓ **Solid Oxide Electrolyzers (SOEC):** Emerging technology, potential 85-90% efficiency, currently \$2,000-3,500/kW

Green hydrogen costs have declined 60% since 2015 and are projected to reach \$1.00-2.00/kg by 2030-2035 in regions with abundant renewable energy.

2.4 Biomass Gasification

Biomass gasification converts organic materials into hydrogen-rich syngas:



Production Cost: \$2.00-4.00/kg H₂; **Carbon Intensity:** Near-zero to carbon; **Efficiency:** 40-55%

This method offers carbon-neutral or carbon-negative hydrogen when using sustainably sourced biomass, though scalability challenges and feedstock availability limit widespread deployment.

2.5 Turquoise

Turquoise Hydrogen is produced through **Methane Pyrolysis**, a process that uses thermal energy to split methane (natural gas) into hydrogen gas and **solid carbon**. Because the carbon byproduct is a solid (carbon black) rather than a greenhouse gas, this method avoids direct CO₂ emissions.

It serves as a critical low-emission bridge by leveraging existing natural gas resources while ensuring a near-zero carbon footprint.

3. Cost & CO Intensity Analysis

3.1 Current Cost CO Intensity Structures

Hydrogen production **Costs & CO Intensity** vary dramatically by method and region: **(2026 Estimates)**

Hydrogen Type	Production Method	Energy / Feedstock Source	Capital Cost (USD/kW)	Operating Cost (USD/kg H ₂)	Total Cost (USD/kg H ₂)	CO ₂ Intensity (kg CO ₂ /kg H ₂)
Grey	SMR	Natural Gas	300 – 900	0.8 – 2.0	1.2 – 2.5	~9 – 12 (High)
Blue	SMR/ATR + CCUS	Natural Gas	700 – 1,600	1.2 – 2.8	1.8 – 3.5	~1 – 4 (Low)
Green (Wind)	Electrolysis (PEM / Alkaline)	Wind Power	900 – 1,600	2.5 – 6.0	3.0 – 7.0	~0
Green (Solar)	Electrolysis (PEM / Alkaline)	Solar PV	800 – 1,500	2.2 – 5.5	2.8 – 6.5	~0
Pink / Purple	Electrolysis (AEL / PEM / SOEC)	Nuclear Power	1,200 – 2,200	1.5 – 3.5	2.0 – 4.0	<0.5
Turquoise	Methane Pyrolysis	Natural Gas / Biomethane	900 – 1,800	1.2 – 2.5	2.0 – 3.2	~0 (Solid C)
Biomass	Biomass Gasification / Reforming	Biomass (wood/agri)	800 – 1,500	1.2 – 3.0	~2.0 – 4.0	Low / Potentially Negative

3.2 Cost Reduction Trajectories for Green Hydrogen (Validated)

3.2.1 Electrolyzer Scaling: Electrolyzer manufacturing capacity is expected to expand rapidly through this decade. Larger production volumes can push **capital cost reductions of 40-70% by 2030**, as cumulative capacity grows and factory learning curves mature.

Drivers: Economies of scale in manufacturing; Standardized stacks and modular production; Global supply chain diversification

3.2.2 Renewable Electricity Cost Declines: Renewable power prices remain the dominant input cost for green hydrogen (often >60% of total). In many sun-rich and wind-rich regions, solar tariffs are expected to fall to **~\$1530/MWh by 2030** a major enabler of low-cost green hydrogen.

Impacts: Wind & solar **LCOE** (Levelized Cost of Electricity) declines directly reduce hydrogen production cost. Long-term PPAs and repowered wind fleets improve grid integration.

3.2.3. Electrolyser Efficiency Improvements: Ongoing R&D and scale-up are projected to raise **stack efficiencies to ~75-85% (HHV)** by 2030. Efficiency gains reduce electricity consumption per kg H and lower operating costs.

3.2.4. System & Balance-Of-Plant Optimization: Integrated design approaches (co-location with renewables, shared balance-of-plant) are expected to cut non-electrolyser costs by **20-40% by 2030**. This includes improvements in power electronics, compression, and water management.

3.2.5. Levelized Cost of Steel Production (Hydrogen DRI Impact)

Steel sector studies show hydrogen-DRI shifts cost structures significantly due to the hydrogen input price premium. Validated estimates from **IEA, IEEFA, and independent technical models** yield the following levelized cost ranges:

Steel Route (USD/tonne)	Approx. Cost Range	Key Drivers / Notes
Traditional BF-BOF	~400-550	Mature, low FE cost
Natural Gas DRI-EAF	~450-600	Lower emissions vs BF-BOF
Hydrogen DRI-EAF (Current)	~650-850	Higher hydrogen cost adds premium
Hydrogen DRI-EAF (2030 proj.)	~500-650	Reduced hydrogen cost narrows gap

4. Constraints and Challenges

4.1. Infrastructure Requirements

Green hydrogen production is infrastructure-intensive. Electrolysis requires approximately **9 liters of demineralized water per kg of hydrogen**; a **1 Mtpa H-DRI steel plant** typically consumes **5070 million liters annually** for hydrogen alone. Electricity demand is far more significant, at **3,0004,000 GWh per year**, requiring **450600 MW of dedicated renewable capacity**, depending on capacity factors. Hydrogen storage and transport remain challenging due to low volumetric energy density, necessitating compression, liquefaction, or chemical carriers, with **global hydrogen infrastructure investment estimated at \$150300 billion by 2040** (IEA, Hydrogen Council).

4.2. Technical Challenges

Hydrogen embrittlement poses material risks for pipelines, storage vessels, and plant equipment, limiting hydrogen blending in existing gas networks to **~520% without major upgrades**. Hydrogen-based DRI furnaces also require significant process modification, as most current plants operate on natural gas or syngas; **retrofitting costs typically range from \$50150 million per plant**. Additionally, renewable intermittency reduces electrolyzer utilization below **4550%**, hydrogen costs rise sharply making storage, oversizing, or hybrid power systems necessary.

4.3. Supply Chain Constraints

Electrolyzer manufacturing capacity, while growing, reached only **~1112 GW per year in 2023**, far below the **200300 GW per year required by 2030** under net-zero pathways. Workforce availability is another constraint, with the hydrogen economy expected to require **300,000500,000 skilled workers globally by 2030**. Critical materials, particularly **iridium and platinum used in PEM electrolyzers**, present additional bottlenecks, reinforcing the need for alternative electrolyzer technologies and catalyst reduction.

4.4. Regulatory and Safety Frameworks

Hydrogens **wide flammability range (475% in air)** and invisible flame necessitate stringent safety systems and standards. While international guidelines such as **ISO 19880** are evolving, regulatory frameworks remain uneven across jurisdictions, increasing permitting complexity and project risk for first-mover investments.

4.5. Economic and Financial Barriers

Hydrogen-based steelmaking is highly capital-intensive, with **greenfield H-DRI plants costing \$1.21.8 billion per Mtpa**, approximately **4060% higher** than conventional steel routes. Market uncertainty around long-term hydrogen pricing and carbon policy increases financing risk, making **1520-year offtake agreements essential**. Although buyers are willing to pay a **green premium of \$50200 per tonne of steel**, this remains insufficient to

close the full cost gap without policy support mechanisms.

4.6. Overall Assessment

The transition to hydrogen-based industrial systems is constrained less by technology readiness than by **infrastructure scale, cost of clean electricity, supply-chain maturity, and policy certainty**. Addressing these barriers in parallel is critical for hydrogen to move from pilot projects to mainstream industrial deployment.

5. Conclusion

Hydrogen-based steelmaking anchored by H-DRI and supported by diversified hydrogen production pathways (green, blue, biomass, turquoise, and nuclear-powered electrolysis) offers the most credible route to deep decarbonization of primary steel. While green hydrogen remains the long-term endgame, near-term scaling will depend on cost-competitive transition options, declining renewable LCOE, and infrastructure readiness.

Data clearly shows that by 2030, falling electrolyzer costs and low-cost renewables can narrow the cost gap with conventional BF-BOF routes. Ultimately, policy certainty, long-term offtake commitments, and integrated energy industrial planning will determine how fast hydrogen moves from pilot projects to the backbone of net-zero steel.

References

1. International Energy Agency (2023). Iron and Steel Technology Roadmap
2. World Steel Association (2023). Steel Statistical Yearbook
3. Hydrogen Council (2023). Path to Hydrogen Competitiveness
4. HYBRIT Development AB (2023). Fossil-Free Steel Production: Technical and Economic Feasibility
5. ArcelorMittal (2023). Climate Action Report
6. International Renewable Energy Agency (2023). Green Hydrogen Cost Reduction
7. Boston Consulting Group (2023). Green Steel: Decarbonizing the Hard-to-Abate Sector
8. Voestalpine AG (2023). greentec steel: Decarbonization Roadmap
9. McKinsey & Company (2023). Hydrogen Insights Report
10. Material Economics (2023). Industrial Transformation 2050: Pathways to Net-Zero Emissions

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HOW TO PREPARE FOR SUPPLY CHAIN DISRUPTIONS IN 2026: 10 LEADERS SHARE WHAT THEY ARE DOING NOW

LIZZIE PROJELLA

From multi-tier sourcing to digital twin modeling, 10 business and operations leaders share the specific actions they are taking to build supply chain resilience in 2026.

Supply chain disruptions are no longer rare events. Port closures, geopolitical shifts, labor shortages, and technology outages have become recurring operational realities, and the companies absorbing those shocks best are the ones that planned for them before they happened.

Building resilience today looks different than it did five years ago. The old model, optimized around lowest cost and single-source efficiency, leaves organizations exposed when any one node in the chain fails. The shift happening now is toward adaptability: redundant suppliers, real-time data visibility, documented protocols, and systems that can reroute before a disruption becomes a crisis.

To understand what that preparation looks like in practice, we asked business and operations leaders across logistics, e-commerce, software, and services one question: what is one specific action you are taking to prepare your supply chain for future disruptions?

Their responses span sourcing strategy, systems integration, infrastructure redundancy, and scenario planning. Here is what they shared:

- Remap Your Sourcing Corridors Before the Next Port Closes
- Build Your Labor and Inventory Buffers Into the Service Model Itself
- Connect Your Systems First. Resilience Follows From a Unified Data View
- Replace Traditional Schedules with Real-Time Data and Predictive Reordering
- Mirror Your Infrastructure and Document Every Role Before Someone Leaves
- Move Operations Online and Test Your Backups Before You Need Them
- Run a Dual-Supplier Strategy with a Dashboard That Catches Delays Early

- Simulate the Disruption Before It Happens with Digital Twin Modeling
- Stop Relying on Single Providers. Line Up Regional Backups Now
- Run Fire Drills on Your Backups. Do Not Just Trust the Plan on Paper

Remap Your Sourcing Corridors Before the Next Port Closes

Based on recent trends, the one way I am preparing HMA Inc. for future disruptions is by aggressively implementing Multi-Tier Sourcing and Regional Diversification. We have moved away from the 'single-hub' model that dominated the last decade.

The specific action I have taken is the re-mapping of our primary Asia-to-North America corridors to include secondary 'China Plus One' hubs in Vietnam and India. By establishing bonded warehouse agreements and pre-cleared customs protocols in these alternative regions, we ensure that a single port closure or geopolitical shift in one country does not freeze our clients' entire supply chain.

We are also investing in Predictive Inventory Modeling, shifting from reactive shipping to holding strategic 'buffer stock' closer to the end consumer. In 2026, resilience is no longer about having the cheapest route; it is about having the most adaptable one.

Areg Dadashyan, CEO at HMA Inc. | International Freight Forwarding & Logistics Expert., HMA Inc

Build Your Labor and Inventory Buffers Into the Service Model Itself

As Operations Director for 1,358 units at Middletown Self Storage, I manage the logistical flow of both physical moving supplies and the labor required to keep our facilities at peak occupancy. My role involves navigating recent trends in labor volatility and retail shortages that can stall a customer's moving process.

To address disruptions in the moving labor market, we took the specific action of partnering with Surv! to provide guaranteed free local move-ins for new rentals. This integrates a reliable labor provider directly into our

service chain, ensuring that a shortage of independent movers doesn't prevent our clients from accessing their units.

We also countered supply chain instability by transforming our offices into high-volume retail hubs for packing materials like boxes, tape, and bubble wrap. By maintaining deeper on-site inventories of these specific products, we shield our customers from regional retail stockouts that frequently occur during peak moving seasons on Aquidneck Island.

Hannah Snow, Director of Operations, Middletown Self Storage

Connect Your Systems First. Resilience Follows From a Unified Data View

In a word: integration. We're focusing on building a more integrated, real-time data foundation across our supply chain. Most disruptions aren't entirely unpredictable, but they're hard to manage when data is fragmented.

We've prioritized tighter integration between our TMS, ERP, and partner systems to create a unified view of orders, shipments, and exceptions. This allows us to quickly identify risks like carrier performance issues or delays and act before service is impacted.

This integration-first approach helps our clients shift from reactive to proactive and lays the groundwork for predictive analytics and AI-driven decision-making.

Nick Fryer, Vice President Marketing, Sheer Logistics

Replace Traditional Schedules with Real-Time Data and Predictive Reordering

Another tangible step I'm taking to get our supply chain ready for upcoming disruptions is leveraging real-time data and predictive analytics. We've implemented a data platform that allows us to access real-time data from our suppliers, inventory systems, and demand. This has enabled us to identify disruptions before they occur and consequently adjust our ordering and safety stock decisions based on predictions rather than traditional schedules. This has allowed us to minimize stockouts when demand changes suddenly and react quickly when we sense a problem with one of our suppliers. By leveraging constantly changing data and acting on it in real time, we're becoming more resilient without overstocking.

Dario Ferrai, Co-Founder, Openclaw VPS

Mirror Your Infrastructure and Document Every Role Before Someone Leaves

Mirroring the infrastructure in terms of technology helps avoid the complete loss of connectivity in the event of regional outages.

Right now I have exact copies of all work environments. Server failure creates an instant switch. Most companies ignore their digital supply connection. Redundancy requires a 20% increase in monthly overhead to maintain service consistency as the main metric for long term growth despite external shocks.

By standardizing internal protocols, any member of the team can fill in a position in the event of sudden movements in the team.

At the same time each task is performed according to documented instructions which we update every 90 days. In short this ensures no bottlenecks when staff are away. Knowledge on paper means that personnel movements cease to be a threat. Protocols enable any new contractor to learn the workflow in less than 48 hours.

Before the next crisis strikes, audit your current team for single points of failure. In the end map out every task out today and determine exactly who steps in when your primary lead vanishes without any prior notice.

Travis Hoechlin, CEO, RizeUp Media

Move Operations Online and Test Your Backups Before You Need Them

We moved our onboarding and deal tracking online so we wouldn't get stuck whenever third party tools slowed down. When cloud outages hit last year, our backup systems kept everything moving. If you run a similar operation, you really should spend time stress testing your setup. It sounds like a pain, but it saves you the moment something goes wrong.

Andrew Gazdecki, CEO, Acquire.com

Run a Dual-Supplier Strategy with a Dashboard That Catches Delays Early

We run an e-commerce operation alongside our software business, so supply chain reliability directly impacts our bottom line. The specific action we took was building a dual-supplier strategy for every product category we sell. After getting burned in 2023 when our primary supplier in Shenzhen went dark for three weeks during a factory consolidation, we now maintain at least two vetted suppliers for every key product line, one in China and one in either Vietnam or India.

The real game-changer was building a simple internal dashboard that monitors supplier lead times in real time. Our dev team built it in about two weeks using our existing tech stack. It pulls shipping data from our logistics partners and flags any supplier whose average delivery time drifts more than 20% above their baseline. Last quarter, that system caught a slowdown from one of our packaging suppliers a full ten days before it would have caused stockouts. We switched orders to our backup

supplier and avoided what would have been about \$15,000 in lost sales. The lesson I keep coming back to is that supply chain resilience is not about predicting the next disruption, it is about having the systems and relationships in place so you can react within 24 hours when something goes sideways.

Shehar Yar, CEO, Software House

Simulate the Disruption Before It Happens with Digital Twin Modeling

One approach we often discuss with our customers is preparing the supply chain through scenario planning and digital twin modeling. Disruptions today happen faster than traditional planning cycles can respond. This includes supplier shutdowns, port delays, and sudden changes in demand.

A question I often ask our customers is simple. “What would happen to your network if a key supplier or transportation route became unavailable tomorrow?”

This conversation usually leads organisations to build a digital model of their supply chain so they can simulate disruptions before they occur. These models combine data from systems such as ERP, transportation, and inventory platforms to test different scenarios and identify the best response in advance.

The most practical action many companies are now taking is running continuous scenario testing. Teams simulate supplier risks, transportation bottlenecks, and demand shocks so they can see the impact early. When disruption happens, they already know the best alternatives such as shifting production, adjusting inventory levels, or rerouting logistics.

Raphael Yue, Chief Executive Officer, Sophus Technology

Stop Relying on Single Providers. Line Up Regional Backups Now

We stopped relying on single providers and started lining up regional backups. Now if one place has staffing trouble or shipping delays, someone else picks up the slack. We are six months in and service interruptions have basically stopped. It also made it easier to handle a sudden demand spike in a few cities. You should figure out where you’re exposed and get backup partners ready.

Enrico Westrup, CEO, WMD Alltagshelden

Run Fire Drills on Your Backups. Do Not Just Trust the Plan on Paper

At AthenaHQ, we switched to a multi-cloud setup because single provider backups were too slow for our pace. The difference was clear immediately. Those small outages that used to pop up during third-party issues vanished. Now our platform stays up even when the big

providers go down. You need to run actual fire drills on your backups instead of just trusting the plan on paper.

Andrew Yan, Co-Founder and CEO, AthenaHQ

The Bottom Line

Supply chain resilience in 2026 is not a single strategy. It is a set of overlapping decisions across sourcing, systems, people, and infrastructure. The leaders contributing here are approaching it from different angles, but the common thread is the same: the companies absorbing disruptions best are the ones that built redundancy into their operations before the disruption arrived.

Key actions these leaders are taking right now:

- Replacing single-source models with multi-tier sourcing and China Plus One regional hubs in Vietnam and India
- Building bonded warehouse agreements and pre-cleared customs protocols in alternative regions
- Shifting from reactive shipping to strategic buffer stock held closer to end consumers
- Integrating TMS, ERP, and partner systems to create a real-time unified view of the supply chain
- Using predictive analytics platforms to detect supplier slowdowns before they cause stockouts
- Mirroring infrastructure and documenting protocols so any team member can step into any role within 48 hours
- Running dual-supplier strategies with internal dashboards that flag lead time drift in real time
- Using digital twin modeling to simulate supplier shutdowns, port delays, and demand shocks before they occur
- Replacing single regional providers with backup partners to eliminate single-point-of-failure exposure
- Adopting multi-cloud setups and stress-testing backups through live fire drills

For teams that need to move faster, working with **supply chain placement agencies** that specialize in operational roles can accelerate the process of building the right team before the next disruption hits.

Source: scope recruiting

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IMPACT OF GEOPOLITICAL FACTORS IN DESIGNING GLOBAL SUPPLY CHAINS

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Abstract : The global supply chains were emerged during 1990s soon after the imposing the liberalization, privatization and globalization. The companies were sourcing materials / inputs from one countries / continents, creating final products in another countries / continents and moving the products to other continents for selling. This was giving the supply chain (cost) and responsiveness benefits to companies globally. When the geopolitical factors have started influencing on the global supply chains, then companies started looking their supply chains for reconfiguring. The author has considered three important contexts for analysis i.e. Covid-19 pandemic, Russian- Ukraine war and West Asia ongoing conflicts. In all the three situations, supply got affected, change in consumer buying behavior, increase in cost, issues related to logistics management and influence on global supply chains. This has affected the global economy in general and international trade in particular. The study is conducted based on secondary data. There is scope to conduct empirical studies further on this topic.

Keywords: *Geopolitical factors, global supply chains, pandemics, conflicts, war*

Introduction : A supply chain design problem comprises the decisions regarding the number and location of production facilities, the amount of capacity at each facility, the assignment of each market region to one or more locations, and supplier selection for sub-assemblies, components and materials (Chopra, Meindl and Kalra, 2013). Global supply chain design extends this definition to include selection of facilities at international locations, and the special globalization factors this involves. Designing global supply chains requires balancing efficiency, cost, and resilience. Successful networks map exact facility locations, leverage postponement strategies to delay product differentiation, diversify suppliers to mitigate geopolitical risks, and deploy predictive digital twin technologies to optimize inventory and logistics in real time.

There are many factors plays in the supply chain network design decisions, out of which the political dimensions are crucial. For example, the Nagpur plant, which was the lowest cost producer before Indian Paints decided to put up the Baddi plant in Himachal Pradesh, is now on the chopping block (Shah, 2023). Another example, The Tata Nano car project was originally slated for Singur, West Bengal. However, following political protests over land acquisition, Tata Motors relocated the facility to Sanand, Gujarat in late 2008. It is also seen that while the Nano is no longer in production, the Sanand plant

now manufactures other models like the Tiago, Tigor, and various EVs.

Global Supply Chains : A global supply chain is the worldwide network of suppliers, manufacturers, warehouses, and distributors involved in producing and delivering a product across multiple countries. Companies use this international model to reduce costs by accessing lower-priced materials and labor, though it introduces vulnerabilities to geopolitical and economic disruption. Core components global supply chains are: supply management, operations management, logistics management, coordination and customer / competitor orientation. A single product can span multiple continents before reaching the end user. For example, a Smartphone might be designed in the United States, manufactured using chips from Taiwan, assembled in China & India and finally distributed to consumers in India and Europe. Another perspective is if company sources raw materials in China, manufactures the product in India and sells it to customers in North America, its supply chain is global. Figure 1 depicts a typical global supply chain.



Figure 1: Global supply chain

Global supply chain management is driven by the need to balance cost efficiency with market responsiveness. Key factors propelling its global expansion include technological advancements (AI, automation, real-time analytics), global sourcing for optimal labor and materials, customer demand for faster fulfillment, and the necessity for resilience against disruptions.

There are five key factors that must be focused on to manage global supply chain networks: centralizing production, conducting market intelligence reviews, meeting shipper needs to add value, and ensuring procurement officers minimize customs duties (BCG, 2026).

Geopolitical factors are fundamentally reshaping global supply chains, pushing companies away from efficiency-only models toward security and resilience. Driven by trade barriers, regional conflicts, and critical resource chokepoints, businesses are actively restructuring operations through localization, **nearshoring**, and **dual-sourcing** to hedge against political volatility

Geopolitical factors fundamentally reshape global supply chains by replacing cost-efficiency with resilience, risk mitigation, and economic security. Driven by trade wars, sanctions, and regional conflicts, companies are transitioning from highly concentrated global networks to localized, diversified model. Figure 2 describes the framework for supply chain network design decisions.

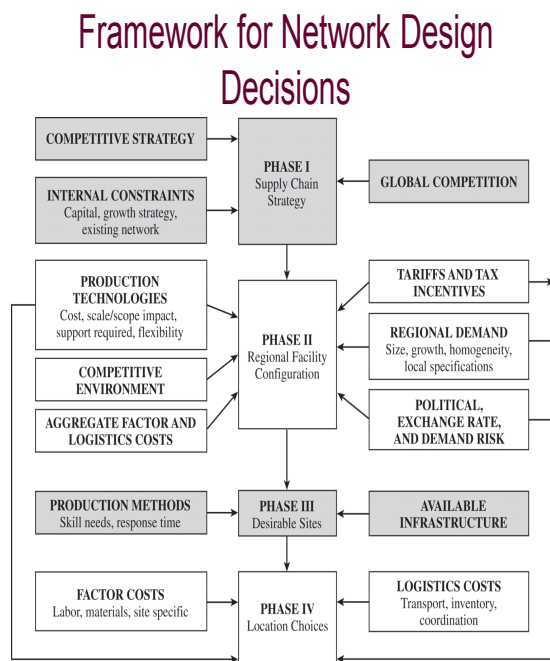


Figure 2: Framework for Network Design Decisions (Chopra, Meindle & Kalra, 2013)

Traditionally, Political factors are considered under Phase II Regional Facility Configuration. The companies were concentrating on supply chain efficiency (cost) and responsiveness. But, now the geopolitical factors are given more priority considering the supply chain resilience and risks.

Geopolitical factors : These include area studies, climate, topography, demography, natural resources, and applied science of the region being evaluated. A few examples are military conflicts and political power including war and terrorism, social unrest, international relations, ethnic and religious tensions, cyber security threats, geographic factors, economic growth, and many others that can have an impact on a global scale. Political factors are government, trade & tax policies, general political issues, changes in leadership, regulation, and political trends. Table 1 describes the geopolitical factors in the global supply chains.

Table 1: Geopolitical factors in the Global Supply Chains

Sl. No	Geopolitical factors	Details
1	Trade Wars and Tariffs	Tariffs can drastically increase costs and disrupt established supply chain routes. Companies must constantly reassess their supply chain strategies in response to shifting trade policies. For example, US and China
2	Political Instability	Regions facing political turmoil or civil unrest pose a significant risk to supply chains. Events such as protests, wars, or changes in government can lead to sudden disruptions in production and distribution.
3	Regulatory Changes	Changes in government policies regarding environmental protection, labor laws, and trade agreements can influence supply chain operations. Organizations must stay informed about regulatory shifts to maintain compliance and avoid penalties.
4	Natural Disasters and Climate Change	Geopolitical factors are intertwined with environmental issues. Climate change can lead to more frequent and severe natural disasters, impacting supply routes and operational capabilities.
5	Technology Warfare and Cyber security	As supply chains become increasingly digital, cyber security threats can destabilize operations. Geopolitical tensions can also lead to technological confrontations that disrupt supply networks.

Implications for Businesses : Diversifying Supply Sources: Companies should avoid dependency on single suppliers or regions. By diversifying their supply base across various countries and regions, businesses can mitigate risks associated with geopolitical disruptions.

Building Resilience: Implementing strategies such as just-in-time inventory can be beneficial, but businesses should consider integrating more robust inventory management systems that allow for flexibility and quick response to geopolitical changes.

Investing in Technology: Embracing technology such as AI, blockchain, & IoT can improve transparency and traceability in supply chains. This helps organizations quickly identify and address vulnerabilities.

Continuous Monitoring: Establishment of a geopolitical risk assessment framework that continuously monitors changes in global political climates is vital. This enables businesses to make informed decisions based on real-time data.

COVID 19 Pandemic : Well before the COVID-19 outbreak, geopolitical, technological, and economic forces had begun to redefine globalization. Companies have been realigning global supply chains in response to shifting manufacturing cost structures, improvements in advanced manufacturing technologies, tariff wars, and rising protectionism. Many global enterprises have been moving toward regional manufacturing and sourcing footprints in order to be closer to end markets. Their factories in China are increasingly targeting the huge, still growing domestic market and nearby countries, while factories in North America and Europe concentrate on local markets.

The trade war between the US and China accelerated

shifts in procurement. Trades between the two economies have dropped by 16% in the year 2019. US auto-part imports from China fell by 17%, but rose by 10% from Turkey and 24% from Southeast Asia. And while US imports of consumer durables from China shrank by 19%, they increased sharply from Japan, South Korea, India, Brazil, and Southeast Asia. Samsung moved Smartphone manufacturing from China to India and Vietnam, for example, while LG Electronics shifted refrigerator production for the US market to South Korea.

Covid-19 pandemic outbreak has affected public life to a larger extend and made the economic

activities into a grinding halt across all sectors. Events like Covid-19 pandemic upend global supply chains and leave companies scrambling, from internal decisions to how to work with suppliers and customers, here is what to do now. Supply chain disruption often have a

'Bullwhip effect'. Major supply chain challenges faced by Indian companies during Covid-19 pandemic era are: panic buying, low production output or zero output, all meals at home, no means to transport, last mile delivery of essential items, production related issues and supply chain network configuration issues (Sengottuvelu, 2020).

The COVID-19 pandemic severely crippled global supply chains by exposing the vulnerabilities of "just-in-time" manufacturing. The primary challenges included massive port bottlenecks, sudden shifts in consumer demand, extreme labor and material shortages, and skyrocketing freight costs. COVID-19 has impacted on the effectiveness and responsiveness of Global Supply Chains (GSC) and to propose a set of managerial insights to mitigate their risks and enhance their resilience in various industrial sectors. Figure 3 shows the global supply chain disrupted by the COVID-19 pandemic.

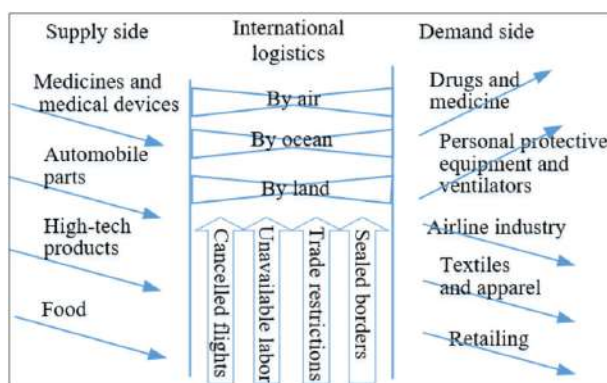


Figure 3: Global Supply Chain disrupted by the COVID-19 pandemic (Zhitaouxu et al., 2020)

In the post COVID-19 pandemic era more than 200 companies out of 500 Fortune companies have moved out from Wuhan Region, China to other countries. Some have come to Asian countries and some have gone to Europe. So, the global supply chains reconfiguration have started.

Russian Ukraine War : The Russia-Ukraine war severely

disrupted global supply chains by triggering acute shortages of critical raw materials, crippling maritime and rail logistics, spiking energy costs, and creating global food and fertilizer crises. The Black Sea blockage halted Ukrainian agricultural and industrial exports. Airfreight and rail logistics were heavily impacted as airspace over Russia and Ukraine closed, and overland freight trains connecting China to Europe were rerouted, driving up freight rates and lead times. Ukraine and Russia accounted for a massive share of global wheat, corn, and sunflower oil exports. Additionally, Russia and Belarus were primary suppliers of global fertilizer components (ammonia, potash, and urea). The war and resulting export blocks sent global food prices soaring by over 60% in the months following the initial invasion.

Dilshad and Sara (2025), the study identifies five major impact domains: (1) food security disruptions, (2) energy market volatility, (3) critical material shortages, (4) transportation bottlenecks, and (5) financial market responses.

Energy/Oil and Gas Supply Chain: The energy/oil and gas supply chain has been severely affected by the conflict, with disruptions to supply chains and increased transportation costs, as both Russia and Ukraine are major producers and transit routes for oil and gas (Khan 2025).

West Asia Conflicts : The report highlights that the consequences extend beyond rising crude oil prices, with increasing pressure on logistics networks, higher input costs, strained trade routes, and growing uncertainty for export-dependent industries. Persistent conflict in West Asia and supply chain disruptions could pose challenges to the domestic economy in the form of higher energy costs, input cost pressures, disruption in trade flows and financial market spillovers. The conflict threatens India's energy security, trade routes, and the safety of over 9 million Indian expatriates in the region. It also risks disrupting remittance inflows and raising global oil prices, impacting India's economic stability.

West Asia accounts for a significant share of India's trade, with around 14% of exports and 20% of imports linked to the region. As a result, the conflict poses meaningful risks to India's trade flows, particularly in the form of higher freight costs, supply delays, and uncertainty over energy supplies.

The conflict threatens India's energy security, trade routes, and the safety of over 9 million Indian expatriates in the region. It also risks disrupting remittance inflows and raising global oil prices, impacting India's economic stability. Nearly 40–50% of India's crude oil imports pass through the Strait of Hormuz, making it a vital energy chokepoint. Any disruption due to conflict can significantly impact India's oil supply and fuel prices.

The energy costs have increased by 40 -50 percent. Crude import has come down. It found that disruptions in supply chains due to geopolitical risks can have serious consequences, from increased costs and delivery delays to production shutdowns.

The results indicate that the impact of geopolitical disruptions on supply chains can be mitigated through:

(1) supply chain re-design including regionalization, backshoring, and moving away from just-in-time delivery models as well as (2) the implementation of emerging technologies, such as blockchain, 3D printing and artificial intelligence, to improve supply chain transparency and the development of modularized manufacturing. T

Conclusion : Every supply chain redesign involves potential changes in sourcing costs, processing costs, and logistics costs. In particular, a company may conclude that it can best meet its strategic objectives by revising, migrating, or regionalizing its supply chain. The Covid-19 pandemic, Russian-Ukraine war and West Asia conflicts have also heightened geopolitical tensions, trade restrictions, and nationalist policies aimed at promoting domestic industry that are likely to continue reshaping the global business landscape. A survey of executives of global companies found that supply chain design requires more than simply following one best practice principle (Cohen et al. 2018). It is a balancing act among multiple objectives and risks. The geopolitical factors not only affecting the company's business results, but it also affect the global economy. During the crisis, managing demand and supply becomes very difficult for the supply chain managers.

References

1. The Impact of Geopolitical factors on Global Supply Chains: A Business Guide, 2026 accessed from www.tvs.com on May 20, 2026.
2. Sunil Chopra, Peter Meindl & Kalra (2013). Supply Chain Management – Strategy, Planning and Operation, 4th Edition, Pearson, New Delhi.
3. Janat Shah (2023). Supply Chain Management – Text and Cases, 2nd Edition, Pearson, New Delhi.
4. Sengottuvelu.C(2020). Supply chain challenges in managing the demand and supply during turbulent times – Covid-19 Pandemic Era. MMR June 2020 Issue.
5. Zhitaou et.al. (2020). Impacts of COVID-19 on Global Supply Chains: Facts and Perspectives. IEEE Engineering Management Review, Vol. 48, Issue 3, August 24, 2020.
6. Dilshad & Sara Rye (2025). The Impact of the Russian –Ukraine war on global supply chains: a systematic literature review. Frontiers Sustainable Food Systems, Vol.25, 2025.

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CONTRACT MANAGEMENT

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Contract Management for any contract of any field is an execution of multiple tasks systematically through certain terms and conditions which is legally viable and technically acceptable. It starts from need of the Project, reason of the need, preparation of technical documents, preparation of commercial guidelines to execute in certain time frame via implementation of step by step manufacturing and fabrication process with proper man power maintaining all regulations on service, man power, safety, environment and cyber security. In a broader sense we can divide the contract management into the following steps:

- A) Preparation of Contract documents (Technical and commercial)
- B) Execution of the project
- C) Collection of Payment from the Client

One contract management is complete when it covers successfully tendering management, ordering management, supply management, erection, commissioning management and collection of payment for ultimate output of the project or product.

- A) In Technical parts detail scope of work with technical specification is to be mentioned to fulfill the need of the project or requirement of any need. To make these documents we have to consider market availability, time frame, cost of

the product and its viability based on the technical knowledge. Clear Engineering knowledge of process flow or manufacturing process for ultimate output of the project or product is required to prepare the technical documents.

In commercial part we should be specific about commercial terms and conditions which is legally viable as per sale of goods act, Transport act, GST act, Import and Export act, Bank regulation act, International freight act, Customs and DGFT act, Environmental act and presently Cyber security act.

- B) In Execution Part of Contract Management we have to draw and manage the complete flow chart of process, sequence of the process, material flow and timing, inventory holding technique and follow up with the sub vendor to timely deliver the drawing, documents and supply followed by erection, commissioning by contractor.
- C) Timely Billing as per schedule to the client and release of payment is also the final part of contract Management.

Contract management becomes successful when all the above tasks are completed within the contract period with desired output.

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MAKE TO ORDER: MAKE TO STOCK : IN SUPPLY CHAIN MANAGEMENT

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ABSTRACT OF THE STUDY/REVIEW: Supply chain in any manufacture base, in an organisation tend to have maximum quantities of machines, products, components, Make to Order that is liable to be Make in stock, against orders, with which they have to be distributed to retailers, dealers, customer or consumers in supply chain. In supply chain Make to Order as production is wholly linked to any of the specific sales orders, as Made to Stock is based upon the sales projection, with proper planning, also with appropriate stock on hand.

In Make to Order, or the Make to Stock have appropriate Lead time, as it takes up the production schedule in supply chain. Make to Order pertains to the process in which Orders generated through consumer or supplier demand, as Make to Stock involves producing the goods, products, components, spare parts, is based on the demand or anticipation in supply chain.

Make to Stock in Production strategy is that the inventory anticipated by consumer, customer, as per the demand, as this sometimes requires re-design, of the operation at required times, keeping the production Make to Order in supply chain.

Make to Stock in supply chain is involving of inventory available, at a pre-determined period, in accordance to forecast of Make to Order, as per demand, as it becomes liable to make the right product, right time, also the right price in supply chain.

Key Words: Make-to-Stock: Make-to-Order: Production: Inventory: Production: Customer: Consumer:

INTRODUCTION: Supply chain demand from the requirement of finished goods inventory, Make to Stock, in order fulfil orders in Production, is to consider that Make to Order, for small quantities when the customer or consumer's requirement is in small quantities in supply chain. Make to Order in supply chain of Original Equipment Machines, which are either manufactured or assembled against a firm order, as the customer is willing to give orders, also wait for delivery from Make to Stock spares, components, spares, products, in supply chain.

Supply chain Make to Order process orders generated through actual consumer demand, producing spare parts, components, finished products, Original Equipment Machines, only when orders are placed, from any of the organisation, with Make to Stock available in inventory within the organisation of manufacturing in supply chain.

Make to Order should also confirm that there are sufficient orders on hand, so that profits are generated, at the appropriate time, with a reasonable criteria on

prices, delivery, quality, as the conflict on this is that the production is fulfilled on the Make to Stock inventory is made available for manufacturing in supply chain.

PURPOSE OF THE STUDY: In many of the organisation finished goods inventory is also considered as stock, if the goods are produced, also correlated with the orders received, as in the case of Make to Stock in general is to keep the stock, to maintain better service, reduce inventory lead time against Made to Order in supply chain.

Make to Order in supply chain for service products, may have less service requirement, but with high value, high demand, variability on the product, as Make to Stock is necessary to keep the inventory, so as to distribute as and when required in supply chain.

Standardization is considered to be very proper in Make to Order, as also the requirement of lead-time, with mixed production, as this becomes attractive, necessary to Make to Stock of the inventory during emergency requirement in supply chain.

LITERATURE REVIEW: In Make to Stock products, materials as inventory, is the anticipated stock with consumer, or customer demand, procured also finished products Make to Order as per demand of the customer's or consumer in 60% of the supply chain.

In supply chain Make to Order productions is sometimes based on the actual orders received, so as to the Make to Stock inventory available at the time of production, depending upon the sales orders, forecasts, prediction, 75% in supply chain.

In some case Make to Order is linked to some of the specific orders, also it is seen that Make to Stock is linked to specific sales order of specific orders constituting 60% in supply chain.

In supply chain Make to Order does reduce waste, sometimes brings less efficiency, also of greater variety, irregularities in sales orders, delivery schedules, not availability of raw materials bringing 50% in supply chain.

RESEARCH METHODOLOGY: In Make to Order is a concern of how raw materials should be sourced, in some cases managing huge inventory, if raw materials are sourced over and above the requirement, as Make to Stock becomes the storage continuity, space requirement, proper accounting, keeping proper stock of the materials in supply chain.

In Make to Order there is likely of change over frequently each time there is new order on hand, so as to enable Make to Stock more reliable to have proper inventory of

materials, spare parts in order to be optimistic of the changes in production in supply chain.

In Make to Order on receiving customers orders, for any assembly of any Original Equipment Machines, requirement, demand occurs for spare parts, as the pull-type occurs, in production process, procurement of materials, parts, design, development, on the basis of Lean Management, can also be concluded with Make to Stock materials spare parts are concluded to be made available in inventory in supply chain.

Make to Order in Enterprise Resource Planning needs to be handled between the Make to Stock, as speculative, where manufacturer is continuous, as Make to Order becomes a part of the production, with modification in supply chain.

RESULTS: Make to Stock products, materials stocked on the basis of requirement of Lean Management in demand, also forecasts, regarded to the push-type of products, materials, parts, is thus required to prevent opportunity to stock-out, with less excessive inventory, accurate forecasts, as a small batch of inventory should perform through demand or quick response with Vendor Managed Inventory, will also be able to accelerate, cash-flow, on being to Make to Order, successful in supply chain.

Supply chain Make to Order in a production strategy, does allow consumers to necessarily purchase products, finished goods, with customized specification, so as to confirm that products, finished goods are manufactured in which the items have taken up confirmed order, since the order from the customer, will become liable to Make to Stock in reduction, also not lead to obsolete, non-moving, slow moving stock in supply chain.

Strategy in Make to Order is that the manufacturing industry, manufacturers the end-product, as the customer places the order, creating an additional period to deliver the product to the consumer or customer in supply chain. The concept of Made to Order relieves the problem of excess stock of inventory on hand, with the coincidence of traditional strategy of Make to Stock in supply chain.

Make to Order should necessarily follow lead-time, more-or-less the customer's lead-time, with the capacity to manufacture, schedule, of determining the dates of the products, material availability in supply chain.

DISCUSSIONS AND FINDINGS: Make to Stock is a considered as a conventional production technique, that is applicable where commodities are produced in large quantities, either in large scale, in accordance with the anticipated demand, as produced items, a few quantity is kept as stock, as the remaining stock are delivered to the requirement of the customer or consumer as and when demand arises in supply chain.

In supply chain Make to Stock offers quick response to the requirement of the consumers or customers, as the stock on hand can be utilized, delivery can be affected, on immediate requirement in supply chain. Make in Stock is considered to be a push supply chain, the strategy is how much to produce, when to produce, as per the

anticipated demand of the consumer or customer in supply chain.

Products of Make to Stock, will be considered to be most advanced requirement, as the expected demand on the resources will necessarily be planned, as they are Make to Order, produced at a fixed price, production is distributed to larger units, as the cost of manufacture, during the cost of production will be considered to be less cost, available in larger economies of scale in supply chain.

In a multi-product manufacturing industry, production, inventory control, Make to Order cater to the increasing varieties of products, with various logistic demands, delivery dates, scheduled production, specified product demand, market segmentation, also production arising out of such situation, in which products manufactured, over which Make to Stock does becomes liable to allocate the capacity of production in supply chain.

FUTURE WORK AND CONCLUSIONS: Schedule of manufacture is considered important to produce Make to Stock products, as the requirement of products may become necessary at any point of time, as they are to be made available so as to satisfy the customer, or consumers, as they become liable to purchase the product, also take delivery of the products or finished goods in supply chain.

Make to Order production is a process, in which products are individually manufactured for a particular customer, on mass production, for an unspecified market, in which the material is required to meet the production from the Make to Stock in supply chain.

Supply chain concept of customer service is to keep the Make to Stock, products, materials, spare parts, delivery, so as to necessarily the Make to Order requirement as an when Order arises, also to make the delivery on time, specified in supply chain.

In supply chain the customers should also have to necessarily wait on placing a firm order, be prepared for a longer lead in Make to Order, in case the manufacturers is liable to provide the firms' confirmation on delivery schedule, also to note the market changes, realities, conditions, with supply disruptions, as Make to Stock will also be provide a solution with designed inventory production, fulfilment of planning for products, materials available in supply chain.

SOURCES OF INFORMATION FROM ELECTRONIC MEDIA:

1. MAKE TO ORDER Vs MAKE TO STOCK: WHAT ARE THE KEY DIFFERENCE? By Planet together:
2. MAKE TO ORDER Vs MAKE TO STOCK PSI ERP Author Winnie Chen Aug 18 2015 in home blog:
3. DEFINING MTO AND MTS PRODUCTION STRATEGY: Tredence: Author Bhaskar Seetharan: Associate Principle Supply chain:
4. MTO-MTS PRODUCTION SYSTEM SUPPLY CHAIN Berkely: Author Phillip M. Kaminsky :University of Berkely Omer Keya : University of Berkely



SIX TYPES OF SHIPPING CRISIS — AND WHAT THEY MEAN FOR FREIGHT PROCUREMENT

PETER SAND

Disruption is familiar. The market's response to it no longer is. Here's why traditional tendering strategies break down in volatile conditions — and how real-time intelligence helps shippers contract smarter.

Shippers have become remarkably good at managing disruption.

Pandemics. Port congestion. Red Sea diversions. Capacity crunches. Strikes. Blank sailings.

After years of near-constant volatility, most procurement teams now have a crisis playbook.

But there's a problem:

That playbook is built on patterns.

And today's market is becoming increasingly unpredictable precisely because those patterns are breaking down.

The ongoing conflict in the Middle East is a perfect example. Rates are reacting differently. Carrier behavior is evolving faster. Capacity shifts are harder to interpret. And historical benchmarks — including last year's contract rates — are becoming less reliable indicators of what happens next.

That creates a dangerous environment for shippers entering long-term contract negotiations.

Because while disruption itself is familiar, the market response to disruption no longer is.

And the cost of getting it wrong is high: locking into inflated rates, exposing supply chains to service instability, or missing opportunities to secure competitive long-term agreements while the market shifts underneath them.

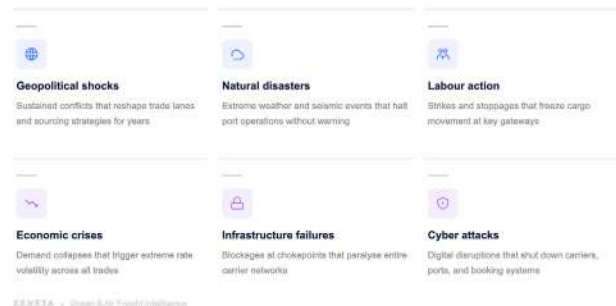
The shippers navigating this environment most effectively are not relying on historical comparisons alone.

They're relying on real-time market intelligence.

In this blog, we'll explore why traditional tendering strategies become riskier during periods of disruption — and how data-driven procurement teams can make smarter long-term contracting decisions even when the market refuses to behave predictably.

Six Types of Crisis : Look back at the last 25 years of shipping disruption and the crises that have shaped the

industry fall into six categories: geopolitical shocks, natural disasters, labour action, economic crises, infrastructure failures, and cyber attacks.



These crises differ in their geographic reach, duration, the trades they affect most directly, and the speed at which they ripple across supply chains.

Geopolitical crises, such as the conflict in the Middle East, are sustained events that reshape trade lanes, restructure carrier networks and alter sourcing strategies for years, not months.

The Middle East Crisis – spot rate shock and market sentiment

Conflict in the Middle East has forced carriers to build entirely new service networks with little to no warning, including rerouting via land bridges such as Jeddah and alternative ports on the Indian Ocean coastline.

This has caused ripple effects beyond the immediate vicinity of conflict. For example, average spot rates from China to North Europe have eased in the past month as the supply chain workarounds stabilize, but remain up 16% compared to pre-conflict on 27 February. Even on the Transpacific trade from China to US West Coast, average spot rates have plateaued at +54% compared to pre-conflict.

On the European ocean container shipping trades, these new routing patterns are now established and carriers have reorganised capacity, meaning ocean container spot rates are easing from the spike in the immediate aftermath of conflict. Compared to one month ago, average spot rates from the Far East are down 6% to North Europe and 13% to Mediterranean.

This is what a long-term geopolitical crisis looks like: a regional shock that restructures global trade flows and leaves no trade lane untouched.

If shippers don't have comprehensive, realtime market intelligence and data, they could look at the current disruption and elevated spot rates and fear their hand has been weakened during negotiations... this is where a single source of market truth becomes critical.

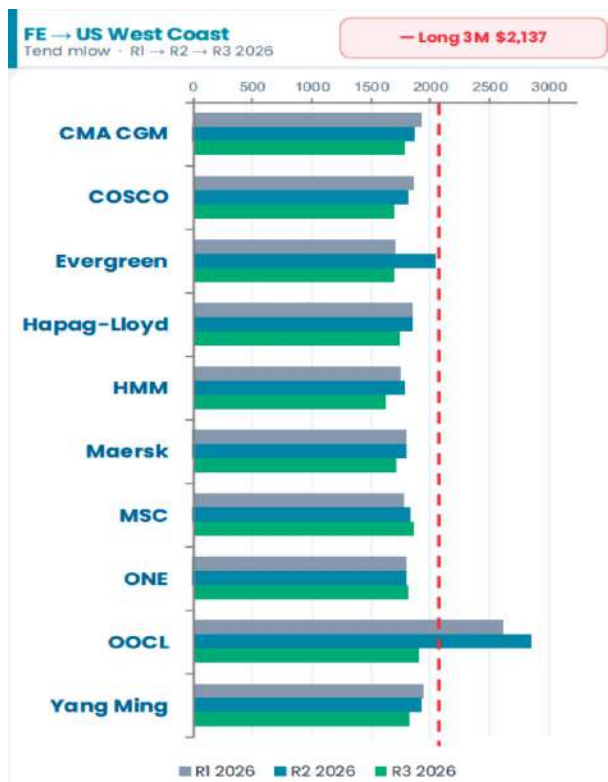
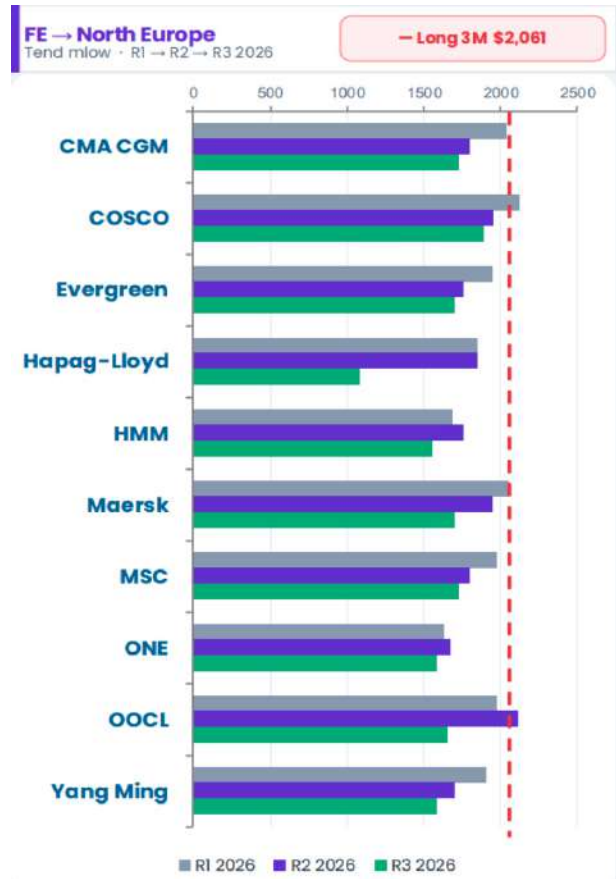
Tendering during a crisis

Shippers must set data-backed targets from the first round of a tender. Carriers will always open high, especially during a period of high-profile geopolitical disruption, but a shipper with access to real market data can call their bluff and know when to push back.

Despite the elevated spot rates and sentiment of fear in the market, the underlying fundamentals of supply and demand still suggest a softening of the long term contract market across global trades. This has been the view since Xeneta published the 2026 Ocean Outlook back in October last year.

Looking at data received from Xeneta customers, they have used this intelligence to play their hand effectively during what could have been a difficult tendering season.

The chart below shows almost all first round bids reported by Xeneta customers tendering on trades from Far East to US West Coast were already below the long-term market average (USD 2,137 per FEU). Despite the disruption, congestion, elevated spot rates and sentiment driven by the ongoing Middle East conflict, the smart shippers use data and intelligence to know not to accept current long-term market levels as a ceiling.



Even from Far East to North Europe — a trade more directly affected by the ongoing Red Sea closure — the majority of Round One bids were below the long term market average of USD 2061 per FEU.

These shippers then used data and intelligence to secure further discounts across Round Two and Round Three.

This tells us that the long-term market is being driven by supply and demand fundamentals rather than the crisis-driven sentiment that is propping up the spot market. With contracts now being finalised for implementation in May and June, this is a signal that the market expects the current level of disruption to be temporary — even if the spot market has not yet priced that expectation in.

Why This Matters

Understanding the type of crisis you are in and the longer term implications, changes what each function in your organisation should be doing right now.

For procurement teams managing the Middle East conflict, the question is whether the rates you negotiated — or are currently negotiating — are going to last the contract term and remain competitive. For example, the impact of geopolitical incidents tend to outlast annual tender cycles, but how this feeds into rates over the longer term can vary significantly from crisis to crisis.

For finance and CFO-level stakeholders, the most important question is not what rates are today. It is how much of the current elevated cost base is structural versus temporary, and whether budget assumptions made before the crisis still hold. When a freight cost surge appears in the P&L due a geopolitical incident, the question that follows in the boardroom is: why did we not see this coming, and what are we doing about it?

Is this a short term pain to be managed or a longer term financial risk?

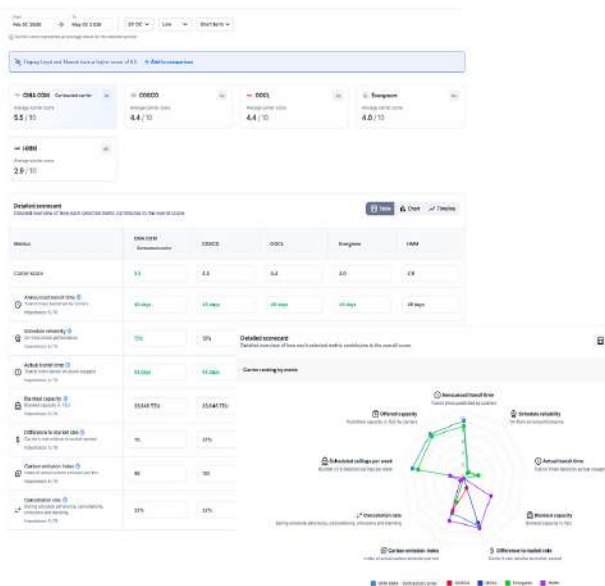
Carriers respond differently during crises

Tendering during a crisis is not just about cost. Carriers will adopt different approaches which must be factored into supply chain resilience strategies.

Carriers ultimately make their own risk assessments in the wake of a supply chain crisis — prioritising the safety of crew, cargo, and vessel. We saw it clearly earlier this year as carriers adopted different strategies on Red Sea and Hormuz transit, with some attempting passage and others rerouting entirely.

The challenge for shippers is that these decisions can quickly impact schedule reliability, transit times, and overall service quality — often before the full market impact becomes visible.

That makes ongoing carrier performance visibility critical during periods of disruption.



With the [Carrier Scorecard](#) (example above), shippers can identify declining performance early, before service deterioration materially impacts their supply chain. For procurement teams running quarterly tenders or frequent allocation reviews, this kind of visibility creates an opportunity to act proactively — rather than waiting until issues become operationally critical.

Five Small Shifts for Shippers Navigating a Disrupted Market

The organisations that navigate crises most effectively are not necessarily the ones with the largest procurement teams or carrier networks. They are the ones that can separate temporary noise from structural change faster than the market around them. That requires more than experience alone. It requires data, visibility, and the ability to challenge assumptions in real time. Here are five shifts procurement and supply chain teams should consider during periods of disruption:

1. Classify the crisis before responding to it
Is this geopolitical, structural, and multi-year, or is it an acute infrastructure shock with a defined recovery curve? The answer could determine whether you renegotiate contracts or adjust routing. Acting with a short-term playbook on a long-term crisis can be an expensive mistake.

2. Watch long and short term markets across all trades — not just your own
The Middle East crisis raised spot rates 46% on the Transatlantic, a trade lane with no direct exposure to the conflict. Shippers who only monitor the lanes they actively use or do not consider the relationship between spot and long term markets will be caught out. Disruption cascades, so the signal is almost always visible in adjacent markets first.

3. Separate surcharges from base freight rates
Emergency Bunker Surcharges, war risk premiums, and port congestion surcharges are not base freight costs. Keeping them itemised and time-limited gives you the leverage to remove them when conditions change. Accepting all-inclusive rates during a crisis embeds temporary cost into permanent contract structures.

4. Use carrier performance data, not carrier promises
During a crisis, carriers vary significantly in how they manage reliability, cancellation rates, and capacity. Data on cancellation rates, actual versus announced transit times, and carrier scorecard performance tells you who is delivering and who is not.

5. Build the case for market intelligence before the next disruption arrives
In every major disruption, the organisations that respond most effectively are the ones that already have access to real-time, lane-level freight rate data and carrier performance benchmarks across long and short term markets. The cost of information asymmetry in shipping is not a rounding error. It shows up in COGS, in budget variances, and in missed savings that compound over years.

The cost of information asymmetry in shipping is not marginal. It appears in inflated contract rates, unstable budgets, missed procurement savings, and supply chain decisions made too late. Because in volatile markets, the biggest risk is rarely disruption itself. It is making long-term decisions with short-term visibility.

Source: xeneta.com

NAVIGATING THE NEW TARIFF-DRIVEN REALITY

Global Trade : 2026's supply chain challenge: Confronting complexity and disruption in global trade

Navigating the new tariff-driven reality

The 2026 Thomson Reuters Global Trade Report reveals that tariff volatility has fundamentally reshaped the trade landscape, with supply chain concerns doubling year-over-year as companies scramble to adapt to unprecedented regulatory complexity and cost pressures.

“Complexity” and “disruption” — those keywords now carry significantly more weight when describing global trade and supply chain management in 2026. But there's a critical shift from previous years: the survey found that 72% of trade professionals identified U.S. tariff volatility as the most impactful regulatory change, a dramatic increase from just 41% the previous year.

The report, based on responses from 225 upper-level trade professionals across North America, the European Union, the United Kingdom, Latin America, and Asia Pacific, paints a picture of an industry in transformation. While challenges have intensified, many trade departments are experiencing unprecedented elevation within their organizations, shifting from cost centers to strategic business partners. ■

Supply chain disruption takes center stage

Supply chain management has emerged as the dominant strategic priority, cited by 68% of trade professionals — nearly double the 35% who identified it as a top concern just one year ago. This isn't merely about day-to-day logistics anymore. Instead, companies are treating supply chain issues — from supplier reliability to customs delays — as enterprise risk. Instead, companies are treating supply chain issues — from supplier reliability to customs delays — as enterprise risk.

“Supply chain reliability is back on the radar in a big way,” noted one survey respondent, reflecting how concerns have shifted from inventory optimization toward prioritizing systemic resilience.

The root cause? **Tariffs** have created cascading effects across operations. Respondents overwhelmingly report cost increases concentrated in imported raw materials and components, creating compression effects on manufacturing margins and export competitiveness. But the implications extend far beyond cost.

“Product costs are increasing, and we are faced with either raising prices at the risk of lower sales or absorbing reduced profits,” one trade professional explained. In fact, 39% of respondents now report their organizations are either absorbing or considering absorbing tariff costs rather than passing them to customers — up from just 13% the previous year.

Navigating supply chain challenges in a world shaped by tariffs

More than three-quarters (76%) of trade professionals believe the new tariffs imposed by the U.S. represent a permanent approach to trade that will persist for at least the next four years, rather than a short-term negotiating tool. This perspective has fundamentally altered how companies approach strategic planning.

The cascading effects include not just costs, but also regulatory compliance burdens, quality concerns, and supply chain reconfiguration. Companies report increased documentation requirements, deeper scrutiny of tariff classification and country-of-origin claims, and more frequent inspections.

“Project schedules are [being] impacted by the complexity and delays in regulatory compliance and customs clearance,” one respondent noted, highlighting how tariffs have tightened execution windows and placed greater premium on trade accuracy and defensibility.

Meanwhile, “Tariffs make it difficult to maintain product quality when using alternate suppliers,” another professional explained, underscoring the difficult tradeoffs companies face when forced to switch suppliers based on tariff considerations rather than quality criteria.

Responses to tariffs are reshaping global supply chain

operations

The response from forward-thinking companies dealing with supply chain issues has been comprehensive. The most **common tariff mitigation strategy** involves changing sourcing patterns (cited by 65% of respondents), followed by renegotiating supplier contracts (57%), and nearshoring or moving manufacturing back to the U.S. (51%).

“Changes in tariffs cause uncertainty in shipping and procurement, which raises logistical costs and makes maintaining agreements with exporters more difficult,” one trade professional described.

These aren’t minor adjustments — they represent fundamental restructuring of supply chains and production footprints. “The financial burden caused by tariffs led us to reorganize our supply chain and production footprint in order to reduce tariff exposure and preserve profitability,” a respondent noted. and production footprints. “The financial burden caused by tariffs led us to reorganize our supply chain and production footprint in order to reduce tariff exposure and preserve profitability,” a respondent noted.

The silver lining: Trade’s strategic advancement

Amid the turbulence, a remarkable shift is occurring: 43% of trade professionals report experiencing enhanced influence over procurement decisions, while 37% note more frequent involvement in executive decision-making.

This strategic elevation is being backed by resources. Survey respondents report increased budget allocations for hiring (43%), technology solutions (38%), and training and development (34%). Looking ahead, even higher percentages expect greater influence over procurement decisions (61%), recognition as strategic business partners (56%), and visibility within their organizations (55%) over the next 12 months.

“Trade functions within organizations are increasingly being positioned as more than simply administrators of transactional filings,” observed **Andrew Moxon**, Senior Product Marketing Manager at Thomson Reuters. “Trade departments are now interpreting crucial regulatory structures and policies, as well as strategically anticipating new shifts and challenges.”

Technology transformation accelerates for businesses

Perhaps most striking is the dramatic acceleration in technology exploration and adoption: 40% of respondents report their companies are now exploring emerging technologies such as **AI** or **blockchain**, compared to just 6% in 2024 — a nearly sevenfold increase.

Trade and supply chain data analytics has become the most widely used technology (58%), followed by automation for **enterprise resource planning** (56%), supply chain management (55%), and supply chain visibility (54%).

“I’m always floored by the trade professionals who say, ‘I still use spreadsheets,’ or ‘I have to download data from one system and then analyze it, and then upload it to another system,’” **Marianne Rowden**, CEO and Director at E-Merchants Trade Council (EMTC), said. “AI can pull that data together efficiently and turn it into actionable information.”

However, significant opportunities remain. Current low adoption for global trade management platforms (32%), tariff management tools (7%), and classification management systems (4%) suggests considerable room for using technology to increase efficiency.

The priorities for technology investment align with strategic challenges: better supply chain visibility tops the list, followed by supply chain security and data protection, predictive analytics, transaction compliance, and insights into tariff changes and their impacts.

Skill and talent shortages persist in the supply chain industry

For years, companies have been dealing with **skill gaps** in managing global trade compliance. As the regulatory landscape continues to get more complex, the skills needed for ensuring compliance are more essential than ever — and are also evolving.

Addressing this requires increased education and awareness along with investment in automation and emerging technological solutions. Many companies are turning to **service providers and consultants** to bridge the gaps.

“We need to recognize that trade compliance is actually a profession,” Rowden said. “It’s a multidisciplinary profession, and we have a lot of liability.”

Cross-functional collaboration emerges across organizations

Nearly one-quarter of respondents (22%) report enhanced collaboration with other departments as a result of the current tariff environment, with Finance (50%), Operations (46%), IT (30%), and Procurement/Supply Chain (30%) as the most common partners.

These collaborations carry significant competitive implications. When trade teams work more closely with Finance, they can better model P&L impacts of different tariff scenarios. Collaboration with Operations and Procurement enables more agile adjustments when disruptions occur. Partnership with IT facilitates the technological transformation necessary for data-driven decision-making.

“We’re seeing trade risk councils and cross-functional working groups emerge organically in response to tariff pressures,” Moxon noted. More than half of trade professionals expect collaboration with other departments to continue growing over the next 12 months.

ESG and supply chain ethics

ESG remains a major focus for supply chains in 2026, particularly in international markets where regulatory expectations and consumer demands for ethical sourcing continue to intensify. **Ethical supply chains** ensure that companies are avoiding the reputational, financial, and operational risk that come with ESG noncompliance.

To comply with ESG objectives requires diversifying supply chains.

“Companies really need to assess their sourcing vis-a-vis their consumer markets because I think the knee-jerk reaction for many companies is to say, ‘Okay, we’ll just move out of China into Southeast Asia,’ but that is filling up with capacity,” Rowden said.

With more vendors comes more complexity and more data — and, therefore, the need for efficient data management systems. “With that is going to come the need for more management, more automation,” Moxon said.

What supply chain professionals should do now

The current environment demands both immediate tactical responses and longer-term strategic positioning:

Immediate actions:

- Build scenario models for different tariff

outcomes to anticipate supply chain issues before they hit customers

- Establish comprehensive systems for real-time regulatory tracking and updates across your entire trade footprint
- Maintain auditable decision logs to defend classification and valuation choices
- Operationalize cross-functional collaboration with regular touchpoints and dedicated communication channels

Strategic initiatives:

- Capitalize on newfound executive visibility by developing dashboards that translate trade actions into measurable business impacts
- Prioritize technology investments in data analytics and **AI-assisted classification** to improve efficiency and enable nimbler decisions
- Form an inter-departmental “trade risk council” with Finance, Operations, Procurement, Compliance, and IT to share updates and run disruption playbooks
- View trade capabilities as a strategic differentiator — involvement in early-stage planning can identify new markets and streamline supply chains for competitive advantage

Managing supply chain challenges in 2026

The picture emerging is one of functional transformation. Trade departments are no longer merely an execution layer of the supply chain — they’re becoming a strategic layer of the enterprise overall. Organizations that will thrive are those that recognize trade as a strategic function worthy of increased investment and focused executive attention, view technology as a force-multiplier for human expertise, and maintain focus on both operational excellence and strategic value creation.

The supply chain challenges of 2026 are significant, and the road ahead may appear uncertain. But these issues pale in comparison to the opportunities available to businesses that approach trade management with strategic vision, technological sophistication, and organizational courage.

Source: tax.thomsonreuters.com



11 WAYS TO MANAGE SUPPLY CHAIN COMPLEXITY

LISA SCHWARZ, SENIOR DIRECTOR OF
GLOBAL PRODUCT MARKETING

Supply chains are complex — a fact of life and a source of operational headaches for most businesses. Supply chain managers who have been around the block know these two things: They need to manage the complexity that is necessary in any system with so many moving parts, and, as importantly, they must do their best to stave off and stamp out all unnecessary complexity in their supply chains. This article breaks down the drivers, types and makeup of supply chain complexity and shares experts' advice on how to manage it.

What Is Supply Chain Complexity?

Supply chain complexity emerges from interconnections and dependencies among the flows and partners involved in the procurement, production and distribution of goods and services. And, unfortunately, as those interdependencies grow in complexity, the odds of a supply chain disruption grow with them. From component shortages and transportation bottlenecks to spikes in consumer demand, disruptions ripple across companies' interconnected and interdependent global supply chains.

Supply chain disruptions can prevent companies from meeting performance goals, making a profit and growing their business by introducing costs, delays and other risks, such as regulatory noncompliance. What's more, a lack of visibility across complex supply chains acts as an impediment to strategic and operational decision-making throughout a company.

Key Takeaways

- § Supply chains are becoming more complex.
- § Specific management techniques can address drivers of complexity that range from customer expectations to environmental considerations.
- § Technological advancements can also help tame complexity, but not without careful integration.

Supply Chain Complexity Explained : Supply chain complexity can bedevil companies, whether they are selling products or services. While manufacturers and retailers need to source the raw materials, components or wholesale goods that go into their final products, services companies also have to maintain a pipeline of the technology, services and other resources that go into

running their businesses.

Compounding the complexity of modern supply chains is the fact that they are always changing, as the following four complexity drivers illustrate:

- § **Structure:** The basic drivers of complexity include the number and variety of suppliers and customers, and the nature of their interactions.
- § **Dynamics:** Change is a constant within any supply chain structure, as customer requirements evolve, competitive threats emerge or disappear, and industry standards advance. And, at the same time, companies in a buyer's supply chain might be striking strategic alliances among themselves, outsourcing to third parties, merging with other companies, adopting new technologies or expanding into new geographies.
- § **Internal factors:** Changing business strategies and communication breakdowns within one's own company can exert sudden pressures on supply chains.
- § **External factors:** Complexity increases with economic, environmental and geopolitical volatility — often unpredictably.

What Causes Supply Chain Complexity?

Supply chain complexity is often a function of size. A small, local business may have a few core suppliers, a single production facility and direct distribution to customers. Midsize businesses may need to manage many different types of suppliers, regional distribution centers and wholesale and retail outlets. And the largest enterprises operate highly complex, global networks of suppliers, production facilities, distribution centers and channels to market.

In each case, there are typically "tiers" of suppliers. In a basic example, a Tier 1 supplier to a clothing company might be a garment maker, which buys from a fabric mill (Tier 2), which buys from cotton farmers (Tier 3). The clothing company's costs, quality and available inventory rely on all three tiers, though it may only have a relationship with the garment maker.

Beyond the basic size and structure of a supply chain, the top four drivers of complexity today revolve around

globalization/localization, supplier network diversification, technology transformation and changing consumer demands.

Four Causes of Supply Chain Complexity

1. Globalization : Many U.S. companies extended their supply chains far from shore in the late 1900s and early 2000s, seeking to benefit from low-cost labor and other advantages. These globalized supply chains generated more complexity from complicated transportation routes, customs controls, currency fluctuations and weather patterns. But the issues involved in international logistics and manufacturing kept piling up, from trade wars and child labor to extreme weather and transportation bottlenecks, and reached a peak during the pandemic. In many cases, the cost/benefit equation didn't add up anymore. The trend shifted to "near-shoring," and, in 2023, for the first time in 20 years, the U.S. bought more goods from Mexico than China.

Still, global sourcing and distribution remain in the picture, especially since most of the world's consumers live outside the United States. In a recent survey by Boston Consulting Group (BCG), 90% of North American executives said they had relocated some of their production or supply base out of China in the past five years. Of those, however, only half reported that they had shifted more than 20% of their related spending.

Such a redistribution can add complexity, especially if it involves setting up shop in entirely new countries. The BCG survey provided evidence of this fact, reporting that only about half of executives involved in redistributing their supply chain said they had met their objectives in terms of improving costs, shortening lead times or meeting sustainability goals. Each world region presents tradeoffs in these and other areas, the report concluded.

2. Supplier Networks : Supplier networks have grown in recent years, as alternative sourcing gained ground as a supply chain strategy for managing risk and increasing resilience. Abandoning single-source arrangements in favor of a broader set of suppliers clearly has its pros and cons — with added complexity headlining the downside list.

Single-sourcing has often meant fewer contracts to maintain, plus increased buying power based on high-volume orders. But it has also exposed companies to disruptions, if a supplier (or a supplier's supplier) runs into trouble.

Alternative sourcing, however, is not an easy choice:

§ **Pros:** As part of the near-shoring trend, which dictates locating production closer to the ultimate customer, the opportunity to set up new suppliers can mitigate some global transportation issues, such

as high energy costs, extreme weather patterns and sporadic bottlenecks. Other benefits of alternative sourcing can include better pricing, due to competition among suppliers; more flexibility in meeting delivery schedules; and an ability to tap into more sources of product innovation.

§ **Cons:** Potential downsides include the need to manage more supplier relationships and all that that entails in terms of transparency, quality control and other challenges. Worst case: Without careful communication and coordination, alternative sourcing could lead to supply chain fragmentation, in which numerous partners in many places operate as discrete links, rather than pulling together as part of the whole.

3. Consumer Demands : Consumer demand is never linear — or, at least, not for long. In just the past few years, for instance, an unprecedented surge in online shopping during the pandemic was followed by a drop-off a couple years later. Retailers everywhere veered from debilitating shortages to bloated inventories.

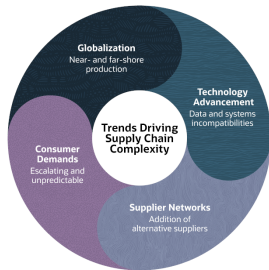
On an ongoing basis, fast fashion, extreme weather and consumer sentiments about spending stand out among the many causes of uncertainty affecting demand. Consumers also have increasingly specific requirements for how fast they want to receive products, as well as where they choose to order and pick up their purchases. Examples for online purchases include same-day or next-day delivery or in-store pickup. People also care more today about the environmental and social conditions under which their products are sourced, produced and shipped.

4. Technological Advancements : Technology is often a double-edged sword. Digital innovations can provide companies with greater visibility across their supply chains to achieve faster responses to potential disruptions. The Internet of Things (IoT), artificial intelligence (AI) and blockchain provide examples in which tiny radios can track items, distributed ledgers can transparently record their progress, and AI-fueled data analytics can detect when things aren't going according to plan.

At the same time, silos and other integration issues often emerge among departments, subsidiaries, buyers and suppliers using different digital tools and systems. Within the same company, for example, a sales and marketing team may rely on a customer relationship management system to track customer orders but lack any visibility into production or logistics databases that report on delays and stockouts. Disconnects like this become even more likely with external supply chain partners.

Despite facing operational challenges, small and midsize businesses may put off technical solutions due to the up-front costs. According to an S&P Global analysis, while large enterprises may have the funds to try out emerging

technologies, most businesses will not invest in digital supply chain transformation unless they can see a potential return within a reasonable time frame.



A continuous loop illustrating four key forces shaping today's supply chains: globalization, technology challenges, expanding supplier networks, and rising consumer demands.

7 Types of Supply Chain Complexity : Experts break down supply chain complexity into seven essential types. Different types of complexity present unique vulnerabilities that call for specific interventions. A seasoned supply chain manager may understand this intuitively, from experience. Yet parsing each type of supply chain complexity can help hone planning, optimize operations and mitigate risks.

1. Structural Complexity : Structural complexity considers the involvement of the number and variety of all supply chain partners and where they are in the world. Participants include a company's internal departments, direct suppliers and, in turn, their suppliers. Companies need to manage structural complexity in and of itself to yield better communication, collaboration and supply chain visibility. They should also understand and address structural complexity in terms of dynamic complexity and the other types of complexity described below.

2. Dynamic Complexity : Dynamic complexity factors in change, whether that change is caused by demand, weather or other conditions. Tracking, analyzing and forecasting dynamic complexity typically involves using modern technologies, such as IoT for real-time data collection and predictive analytics for decision support, which contributes to flexibility and responsiveness in supply chains.

3. Demand Complexity : Customer demand falls under the category of dynamic complexity, but it merits special focus. Companies have long struggled with demand complexity and the need to forecast and meet changing customer demands. Data-driven demand planning and forecasting have become more powerful with the growth of big data and predictive analytics, up to and including AI. Getting a better handle on changing trends in preferences for products, related services and even the way in which they are delivered can improve the management of supply chain functions, including

sourcing, production and inventory.

4. Supply Complexity : What about the product itself? Is it simple or sophisticated? One-size-fits-all or customizable? Is it part of a large or small product portfolio? The greater the supply complexity, also known as product complexity, the higher the potential risks surrounding quality, cost and lead times. According to the PwC management consultancy, companies that rationalize their product complexity can achieve a 25% to 30% cost reduction in supply chain operations.

5. Process Complexity : Process complexity grows as the number and intricacy of steps in a supply chain increase. For example, sophisticated manufacturing, regulatory compliance monitoring and climate control maintenance can complicate handoffs from one supply chain partner or location to another. Processes that must be performed sequentially can run into bottlenecks if any one step falters. Many point to more transparent data sharing and automation, as ways to ease these and other process complexity challenges. Close supplier collaboration, process standardization and modular approaches can also counteract process complexity.

6. Environmental and Social Complexity : Governments, businesses and their customers have become keenly aware of the environmental and social harms that supply chains can cause — the majority of most companies' carbon emissions, for example, are produced by their supply chains. Nearly half of supply chain professionals recently surveyed by Material Handling Industry (MHI), a trade association, said they are under increased pressure to make their operations more sustainable. Meanwhile, California has been leading the U.S. in regulating emissions reporting, with rules currently coming into effect for some companies. The U.S. Securities and Exchange Commission was set to follow with a new rule, too.

As for social complexity, companies doing business in Canada now have to report on their efforts to address forced labor and child labor in their supply chains. Similar requirements are expected to proliferate over time. Consumers are also exerting pressure on companies to adopt better environmental, social and governance (ESG) practices. One proof point: Research by the Nielsen polling company shows that products making ESG-related claims sell better than those that don't.

Companies, in turn, are relying on various innovations to address environmental and social complexity. Among these are centralized systems for suppliers to input their emissions data and supply chain traceability tools, including barcodes and blockchain records, to verify product origins.

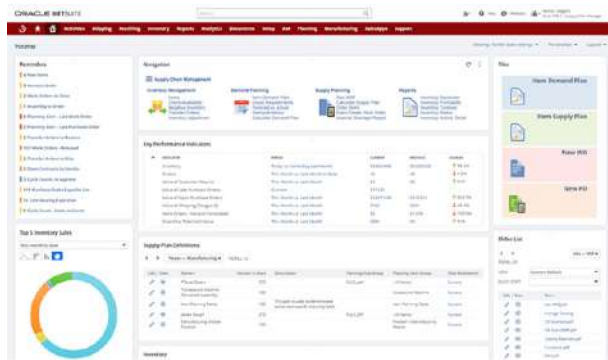
7. Information and Technological Complexity : Information keeps supply chains running, with inputs and updates flowing between and among a company's

departments, its partners and its partners' partners. Data has to be shared about projected demand, inventory levels, the status of orders, the progress of a truck on its way to a port, the conditions at the port — and the list goes on.

Unfortunately, supply chain managers aren't always working with good information. As Martin Christopher, an emeritus professor of supply chain management and logistics, wrote in his textbook on the subject, "The volume of data that flows in all directions [in supply chains] is immense and not always accurate and can be prone to misinterpretation. As a result of this distortion, the data that is used as input to planning and forecasting activities is flawed and hence forecast accuracy is reduced and more costs are incurred."

Another shortcoming is that transparency is limited due to technological complexity. The many systems and data formats used in the supply chain can create silos and gaps at critical points.

One of the biggest complications that has emerged in the digitized supply chain is cybersecurity. Companies must protect their operations from cyberattackers, many of whom break into smaller suppliers with weaker defenses to gain access across a wider supply chain.



NetSuite's customizable supply chain manager dashboard can help companies manage the causes of complexity.

What Determines the Complexity of a Supply Chain?

Breaking down complexity even further reveals numerous root causes of potential friction throughout a supply chain, such as the number of process, stakeholders, locations, and systems involved. Specifically:

- § **Supplier base:** With recent efforts to abandon single-source arrangements and add alternative suppliers to increase reliability, businesses are struggling to find a cost-effective balance between managing too few and too many suppliers.
- § **Interdependencies:** The interdependencies among a company, its suppliers and its suppliers' suppliers make it essential to strike the right balance, since

supply chain partners engage in intense information exchange and other resource sharing to complete each phase of work and hand it off successfully to the next partner. Strategic sourcing techniques can help to reduce interdependencies or improve the quality of communications between and among partners.

- § **Number of components:** Each additional component in a final product can require coordinating yet another supplier, transportation schedule and inventory plan. The delayed delivery of a single component can halt an entire production line in a manufacturing supply chain.
- § **Diversity of products and services:** Similarly, complexity increases whenever a new product or service is added. Each presents its own challenges in sourcing materials, handling the complexity of components, coordinating the changing cast of suppliers, responding to fluctuating demand and fulfilling other needs.
- § **Process complexity:** The many processes involved in a supply chain need to add up to one smooth flow, from procurement and manufacturing to warehousing and distribution. Notably, each of these processes breaks down even further into its own procedures for such essentials as contract negotiation, quality control and others.
- § **Customer demand variability:** Suddenly emerging market trends, loss of consumer confidence in the economy and other shifts in customer sentiment create forecasting challenges and difficulties in balancing supply and demand across sourcing, production and warehousing.
- § **Geographic spread:** The more nodes on a supply chain and the more national borders to cross, the less uniform and predictable are the necessary transportation and warehousing arrangements, customs clearing procedures and customer preferences.
- § **Regulatory environment:** The supply chain bears a great deal of the burden of the diverse and continually shifting regulations imposed on businesses — with rules specific to everything from product quality and safety to sourcing, labeling, transportation and disposal. Notably, the regulatory environment changes from location to location.
- § **External forces:** Beyond regulation, external forces, such as geopolitical conflicts, trade disputes and extreme weather, require the company's constant vigilance and readiness to adapt.
- § **Organizational structure:** Oppositional forces within an organization can be just as disruptive, fomenting strategic course corrections or revenue shortfalls

that trickle out to supply chain budgeting and operations. Conflicting decisions made by disparate departments can also whipsaw a supply chain.

- § **Technological integration:** Information silos can cripple supply chain decision-making and operations; conversely, integration can facilitate transparency, automation and data-driven decision-making.
- § **Innovation and product life cycle:** Companies need to meet expectations that they will continually innovate and bring new products to market, which can cause many, if not all, of the above supply chain challenges to resurface.

11 Ways to Manage Supply Chain Complexity

Many see supply chain resilience as the antidote to the problems of today's complex supply chains. According to BCG, enablers of resilience include the following:

- § A geographically diverse footprint that ensures access to crucial resources and target markets
- § Redundancy of suppliers
- § Flexible sourcing and production
- § Visibility into risks
- § Rapid response to problems

Along these lines, the Wall Street Journal reported that companies are moving some of their production closer to where they expect to sell their goods, expanding their base of suppliers and automating supply chain functions. Companies have also developed bigger buffer stocks of inventory, after decades of prioritizing "just-in-time" deliveries in their supply chains.

Ironically, even supply chain resilience strategies can add complexity, requiring careful balancing of the benefits and risks inherent in adding suppliers, locations and new technologies. Here are 11 approaches to this balancing act.

1. **Streamlining Operations :** One key to managing supply chain complexity is to identify and manage the complexity that is necessary in the system while preventing and eliminating unnecessary complications. Streamlining operations can take many forms, such as standardizing purchase orders or procedures for selecting and onboarding new suppliers; automating repetitive tasks, such as order processing; and taking care to design efficient distribution networks.
2. **Technology Integration :** The theme of technology integration recurs in nearly all advice on managing supply chain complexity. Supply chain management software should integrate with a company's enterprise resource planning (ERP) system to better align all departments and suppliers. Companies can also host supplier portals to enable two-way

information sharing on orders, shipment tracking, performance indicators and invoicing. Modern collaboration platforms can also facilitate scenario planning, modeling and other joint activities.

3. **Supply Chain Design :** BCG's report, "Building the Supply Chain of the Future," says it takes a comprehensive program to build a resilient supply chain that can better handle disruptions. "Such a program comprises network and product design, sourcing strategy and planning," according to the market research firm. "And it must be able — through monitoring, prediction and crisis response — to move quickly when disruption occurs."

4. **Vendor Management :** A recent article in the Harvard Business Review emphasized the need for companies and their suppliers to create flexible, dynamic relationships that can adapt to changing supply chain pressures. Enabled by technology platforms, these types of interactions should replace the point-to-point, static arrangements currently in place.

Disruptions can be avoided if companies position themselves to easily access alternative transportation routes with their current partners, for example, or reach out to alternative suppliers if inventory levels drop. A related supply chain trend involves new, more flexible models for contracts with vendors. These let buyers slice orders into smaller blocks, making it easier to adapt what they're buying in line with volatile market forces.

5. **Demand Management :** Demand management identifies and forecasts customer demand to keep supply chain operations in sync with it. Getting it right can help with scheduling production and achieving the required level of inventory in the correct location, without creating costly surpluses. Other benefits may include the ability to obtain volume discounts based on confident demand forecasting. The ultimate benefit is customer satisfaction, as demand management reduces delays and stockouts.

A demand-forecasting exercise should involve collaboration with internal departments, such as marketing, but also with key suppliers. Data platforms can facilitate the sharing of orders, current inventory levels and forecasts within a company and with supply chain partners. Analytics are becoming increasingly powerful tools for forecasting, thanks to the growing use of AI.

6. **Inventory Management :** Inventory management should work hand in hand with demand management. The key added element here is supply chain visibility. A company's ability to see how materials, components and products are flowing

across its supply chain can reduce the risks of stockouts, overstocks, delays and other issues. Order fulfillment can be accelerated, earning greater customer satisfaction, and production and logistics can be optimized to reduce costs.

Tracking technologies play a significant role in inventory management, as RFID tags and other IoT sensors for transparency are combined with data analytics, which recognize normal patterns and identify where problems might be emerging. Shared platforms with suppliers facilitate a “single version of truth” on which buyers and sellers can base their operations.

7. **Lean Management:** Another inventory management tactic — namely, preserving “just-in-case” overstocks — gained favor in the wake of pandemic-related shortages. Until that time, most supply chain managers adhered to “lean” principles of minimal “just-in-time” inventory management. These days, though, experts say the pendulum is swinging back toward the middle. Many companies are taking a hybrid approach, since reliability is important but lean management is usually more cost-effective. Their supply chain managers are building more resilience into their networks with other methods than overstocking, such as using technology for better visibility and implementing stronger vendor management.

8. **Collaborative Planning :** Collaboration forms the bedrock for supply chain efficiency, whether within a company or across a network of trading partners. Without it, companies cannot achieve critical visibility and quality control. Nor can they enjoy benefits, such as joint problem-solving, when demand suddenly surges, a hurricane is in the forecast, a refrigerated truck breaks down or some other issue emerges.

In the current world of “fast fashion,” retailers rely heavily on supply chain collaboration, sharing their demand forecasts with manufacturers as early as possible. Some companies even enter a type of partnership with their suppliers, under arrangements known as vendor-managed inventory. This approach gives suppliers the responsibility to replenish inventory as needed — within agreed limits.

Clearly, arrangements such as these require careful vendor selection that includes weighing potential suppliers’ collaborative capabilities and cultures before entering a relationship. Then, vendor relationship management becomes pivotal, requiring significant time commitments and communication routines.

9. **Regulatory Compliance** Collaboration also provides

a basis for regulatory compliance. Under most circumstances, supply chains operate across different municipalities, states and countries — all of which have diverse requirements for product safety, environmental impact, data privacy and other business matters. And although a company may outsource some aspect of its supply chain, it cannot “outsource” its regulatory responsibilities.

Working closely with suppliers helps avoid the fines and reputational damage that result when a government declares a company to be noncompliant. Vendor selection and management should include compliance as a value to be assessed and monitored, and contracts should include compliance clauses. At the same time, a company’s own practices should also be governed by a compliance strategy that is actively monitored and regularly updated, especially in highly regulated industries.

10. **Training and Development :** A recent article in the Harvard Business Review reported skills shortages across all points of the supply chain, from “picking and packing” at the warehouse to designing and running an entire supply chain. Automation can fill some of the gap, but more than half of the professionals surveyed by MHI cited challenges in hiring and retaining qualified workers as a top concern with serious repercussions for supply chain performance. Some 40% said they are reskilling and upskilling workers to fill the need, often with staff development for new technologies. Universities, industry associations and others all offer supply chain training and certification programs.

Training programs can help build capacity for companies’ suppliers, as well as their own staff, in areas such as compliance. For example, the U.S. Department of Labor has outlined a social compliance training program for vendors, including topics such as self-audits and subcontractor disclosures.

11. **Risk Management :** At the end of the day, much of supply chain management aims to mitigate the risks inherent in these complex systems. Yet, supply chain risk management should also be addressed in a specific strategy that maps out robust processes for addressing negative events, such as supplier bankruptcies, cybersecurity breaches or the more mundane scenario in which a piece of factory equipment fails. Experts at the McKinsey consulting firm also advise developing a risk-aware and risk-averse culture.

Source: netsuite.com

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INDIA'S PHARMA LOGISTICS FACES THE PATENT CLIFF HEADON

SAKSHI BASUTKAR, JOURNALIST

As blockbuster drugs lose exclusivity, India's supply chains are gearing up for a surge in generics, tighter EU rules, and a coldchain future that demands speed and visibility. Sakshi Basutkar 26 May 2026 6:35 PM India's pharmaceutical industry is preparing for a very important change. On the surface, it may look like another phase of generic drug growth. But when you look closely, something much bigger is happening behind the scenes. Over the next few years, several major drugs across the world will begin losing patent protection. Once patents expire, other companies can manufacture cheaper generic versions of those medicines. India, already known as one of the world's biggest generic medicine producers, is expected to play a major role in this shift. But this is not only a manufacturing story. It is also a story about warehouses, refrigerated trucks, airport handling, API movement, compliance paperwork, temperature monitoring and Europe-bound freight corridors. In simple words, India's pharma supply chain is entering a new phase and everyone across the industry is trying to understand whether the system is truly ready for what is coming next.

The timing is important because this patent expiry wave is arriving at the same time as discussions around the India-EU Free Trade Agreement. If the agreement moves forward, Indian pharmaceutical exports to Europe could become more competitive because of lower tariffs and easier market access. That means higher movement of medicines. And higher movement means more pressure on supply chains. What is making the situation even more interesting is that this shift is no longer theoretical. It has already started happening in India. In March, several Indian pharmaceutical companies launched generic semaglutide products almost immediately after Novo Nordisk's core Indian patent expired. Companies including Dr. Reddy's Laboratories, Zydus Lifesciences, Alkem Laboratories, Sun Pharmaceutical Industries and Glenmark Pharmaceuticals all entered the market with their own semaglutide brands as soon as the patent protection ended.

Dr. Reddy's launched Wegovy-related products under the brand name Reslim, while Zydus introduced Semaglyn, Alkem launched Slimigo, Glenmark introduced Lirafit and Sun Pharma entered the space with its own semaglutide offerings as competition intensified across the market. Some companies launched pre-filled injection pens. Others introduced reusable multi-dose devices. Prices also dropped sharply as competition increased. According to the Pearce IP report, monthly treatment costs began falling from earlier premium pricing levels to nearly 1,800-4,200 depending on the product and dosage. And

the rush may only grow bigger. Reuters reported that more than 40 Indian drugmakers are expected to introduce over 50 semaglutide brands following the patent expiry. This matters because semaglutide is not a niche medicine anymore.

The drug sits at the centre of the global obesity and diabetes discussion today. And in India, where diabetes and obesity cases continue rising, companies see a massive future market. But the moment so many players enter at the same time, pressure automatically shifts towards the supply chain. Factories need to produce at scale. Injection pens need handling systems. Warehouses need temperature control. Transport networks need refrigerated movement. And distribution systems suddenly need to support a much larger patient base than before. That is why the semaglutide wave is becoming one of the clearest examples of how patent expiry is now directly influencing India's pharma logistics ecosystem. A long list of drugs is preparing to go off patent. The shift is not being driven by one or two medicines alone.

The GreyB report on drug patents expiring between 2026 and 2030 shows a long list of important drugs scheduled to lose patent protection over the coming years. These include therapies linked to cancer, diabetes, obesity, liver disease, antivirals and rare diseases. Medicines such as Epcusa, Vosevi, Verzenio, Rinvoq, Kisqali and several others are part of this larger patent expiry cycle. And this is where the story becomes interesting. Many of these are not simple medicines that can move through normal logistics systems without special handling. Some require controlled temperatures. Some are injectables. Some are highly sensitive therapies. Some are extremely expensive. That changes everything for logistics companies. For years, pharma logistics mainly focused on moving large volumes safely from factories to markets. But now, products themselves are becoming more complex. And when products become more complex, supply chains also become more complicated.

Why everyone is suddenly talking about GLP-1 drugs

If there is one category that is creating the most discussion inside pharma companies today, it is GLP-1 drugs. What is also making this category important is that not all GLP-1 drugs work in the same way. Semaglutide-based medicines such as Wegovy and Ozempic mainly work through the GLP-1 hormone pathway. But Mounjaro, whose active ingredient is tirzepatide, works differently because it targets both GLP-1 and GIP hormones together. That dual action is one of the reasons why many companies and healthcare experts believe

tirzepatide-based therapies may become even bigger in the coming years.

The difference may sound technical, but inside the pharma industry it is becoming a major discussion because these therapies are showing stronger appetite suppression and higher weight-loss results in many studies compared to earlier GLP-1 drugs. That is also why companies are watching drugs like Mounjaro very closely even while semaglutide continues dominating headlines. And for supply chains, the importance is even bigger. Whether it is semaglutide or tirzepatide, these medicines usually move through highly controlled cold-chain systems and require temperature-sensitive handling during storage and transport. As more Indian companies enter this space, logistics networks will increasingly need refrigerated warehousing, compliant transport systems and real-time shipment visibility to support rising demand. According to Sreenivas Rao, Global Head of Supply Chain at Sun Pharmaceutical Industries, the biggest excitement in the industry right now is not only around semaglutide, but around drugs like Mounjaro and the larger GLP-1 class. These medicines were first linked mainly with diabetes treatment. But today they are also connected with obesity prevention and lifestyle-related health management. Rao explains that these drugs are changing the way pharma companies think about healthcare itself. "It all started with saying that we will cure blood sugar," he says. "But now these drugs are more about prevention." That changes demand patterns completely. Normally, companies can estimate how many patients may need a medicine. But with prevention-based drugs, the market becomes much larger because even people without major illness may begin using them. "The moment a drug like that goes off patent, it is not only the number of patients who are coming on board," Rao says. "People who are not patients are also coming on board." That is where capacity planning becomes difficult. The real challenge begins after patent expiry. One important thing many people outside the industry do not realise is that patent expiries are not sudden events. Pharma companies know years in advance when a drug is expected to lose protection. Rao says companies have often been preparing for these opportunities for nearly a decade before the actual expiry happens. And Ratish Mukhoti, Head Regional SCM - EMEU & API, Cipla shares a similar view. "This was a planned one," he says. "It's not that it has gone all of a sudden." Mukhoti also does not see immediate pressure on API production because companies have already prepared ecosystems around future generic manufacturing. But even if production planning is manageable, another problem begins once demand suddenly rises after generic entry. That is where logistics starts becoming difficult. Because the challenge is no longer only about making medicines. The challenge is about moving them properly.

India's cold-chain system is still catching up : Many of the newer medicines now entering the market need temperature-controlled handling. And this is where Indian pharma logistics still faces gaps. Rao explains this very simply. "There are three temperature zones pharma

talks about," he says. "15 to 25°C is air conditioning. 2 to 8°C is your refrigerator. -20°C is your freezer." The problem is that many new therapies, including GLP-1 drugs, need transportation in the 2 to 8°C range. That means they need refrigerated movement throughout the journey. "We do not have too many trucks who can actually take 2 to 8°C," Rao says. That one line explains why pharma logistics is becoming such an important topic inside boardrooms today. Because if even one part of the chain fails like a warehouse, a truck, an airport transfer or a delivery point then the medicine itself may become unusable.

Logistics companies are now redesigning their networks

: Across the logistics industry, companies are already preparing for this shift. Kuehne+Nagel says it is expanding healthcare-focused logistics infrastructure near India's major pharma hubs. According to Yuvraj Sharma, Head of Sales & Marketing, Kuehne+Nagel the company now operates six HealthChain- and CEIV Pharma-certified branch offices in India along with temperature-controlled facilities in Bengaluru and Hyderabad. But Sharma says the real issue is no longer only about building facilities. The bigger challenge is consistency across the entire network. "At a national level, the priority is now to ensure these advances are applied consistently across the full network, particularly at the first and last mile," he says. That becomes important as shipment volumes rise and products become more sensitive.

The gaps become bigger outside metro cities : Inside major pharma hubs, cold-chain infrastructure has improved significantly over the years. But once shipments move outside those clusters, the situation changes. Blue Dart says there are still major gaps in smaller cities and regional locations. According to Vikram Manuskhani, National Operations Head at Blue Dart, temperature-controlled transport and storage remain limited across Tier II, Tier III and rural regions. And that matters because healthcare demand is spreading far beyond large urban centres. "The country needs meaningful investment in refrigerated transport, decentralised storage and monitoring systems," Manuskhani says. This is especially important as biologics, insulin, vaccines and specialty medicines continue growing.

Pharma cargo itself is changing : Another major shift happening quietly is the nature of the cargo itself. The medicines entering future supply chains are becoming more specialised. Mansukhani says it is seeing a growing movement of biologics, vaccines, clinical trial material and specialty medicines. That means logistics companies are no longer handling only cartons of tablets. Now they are dealing with products that may need constant monitoring, strict temperature control, faster movement, and detailed compliance checks. Express logistics therefore becomes extremely important. Whether it is APIs, raw materials, diagnostic samples or clinical trial shipments, timing becomes critical. "Temperature assurance, precise handling and real-time coordination are not optional," Manuskhani says.

Warehouses are also changing : The pressure is not only on transport systems. Warehouses are also undergoing major change as pharmaceutical supply chains become larger, faster and more sensitive. For years, pharma warehouses mainly focused on storage and inventory movement, with products arriving from factories, remaining stored and later moving to distributors, hospitals or export markets. But that model is changing quickly. Today, warehouses are expected to do far more than store medicines. They are becoming compliance-driven control centres where companies need visibility over inventory, temperature conditions, batch movement and product handling at every stage. Allcargo Logistics says pharmaceutical supply chains are becoming “more volume intensive and compliance driven” as generic volumes rise. According to Suresh Narayanan, Head of Operations at Allcargo Logistics, the company is strengthening pharma logistics through a nationwide network of distribution centres, transshipment hubs and strategically located warehouses across key logistics corridors. That network is important because pharmaceutical cargo cannot afford delays or handling gaps as shipment volumes increase. Medicines may move through multiple points before reaching customers, including warehouses, distribution hubs, airports, hospitals, pharmacies and export gateways. At every stage, companies need visibility over product location, batch identity, storage duration and compliance with handling conditions. Narayanan says integrated warehouse management systems are helping standardise inventory management, batch tracking and compliance while improving coordination across networks. As patent expiries continue to drive higher generic volumes, pharmaceutical supply chains are becoming more volume intensive and compliance driven. Suresh Narayanan, Allcargo Logistics As medicines become more sensitive and valuable, companies need greater control over storage and movement, especially for temperature-sensitive products. Some medicines require refrigerated storage, while others need tightly controlled handling before dispatch. As more specialty drugs, injectables and biologics enter the market after patent expiry, warehouses will increasingly require temperature-monitoring systems, controlled handling zones and faster turnaround. Pressure is also rising as pharma companies move products faster while maintaining strict compliance, turning warehouses from passive storage spaces into active operational hubs that maintain product quality, visibility and regulatory control.

Digital tracking is becoming essential : One of the strongest themes across the industry today is visibility. Logistics companies want to know where a shipment is, what temperature it is moving at and whether there is any risk during transit. At Kuehne+Nagel, digital monitoring systems now combine carrier data with IoT-based temperature and location tracking. According to Sharma, the company’s HyperCare teams monitor shipments continuously so that action can be taken before problems damage product quality. That kind of monitoring is becoming important because future pharma supply chains will carry more high-value and

sensitive cargo than before. And when products become more sensitive, there is less room for mistakes.

Europe could become a bigger opportunity for Indian pharma : The India–EU Free Trade Agreement could add another layer to this entire story. According to Kuehne+Nagel, India already exports around \$5.8 billion worth of pharmaceuticals to Europe every year. But the removal of European tariffs of up to 11% could make Indian pharmaceutical products more competitive in regulated markets. That may lead to stronger movement of complex generics, injectables and biosimilars. As a result, logistics companies are already preparing for higher activity on the India–Europe corridor. “We are seeing clients expand production in India and integrate it more deeply into their global supply networks through new and direct export lanes,” Sharma says. This means Europe is no longer only a trade opportunity. It is becoming a logistics opportunity as well.

Supply chains are moving closer to the boardroom : One thing becomes very clear after speaking with both pharma companies and logistics operators. Supply chains are no longer sitting quietly in the background. They are becoming central to pharma strategy itself. That is because the next phase of medicines will require more than just manufacturing strength. They will require better temperature control, stronger compliance, faster movement, better visibility, and more reliable distribution systems. Rao says pharma companies are now discussing compliance and distribution practices much more seriously than before. And that is because medicines themselves are changing. Items like semaglutide will create an issue with respect to capacity because you do not know what is the actual size of the market. Sreenivas Rao Nandigam, Sun Pharma Some future therapies may be personalised for individual patients. Some may have very short shelf lives. Some may need extremely precise handling. All of that increases the importance of logistics.

The next few years could reshape India’s pharma movement : India has spent decades building itself into a global generic medicine powerhouse. But the next phase may demand something different. The coming patent expiry wave is not only about making cheaper medicines after patents end. It is about whether India’s supply chain ecosystem can handle larger volumes, more sensitive products, stricter regulations, and faster global movement at the same time. The industry appears confident about manufacturing preparedness. But logistics companies are clearly signalling that distribution networks, cold-chain systems and compliance infrastructure will now face greater pressure. For years, pharma logistics was treated as a support function. Today, it is slowly becoming one of the most important parts of the pharmaceutical business itself. And perhaps that is the biggest change of all.

Source: itln

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HOW ORGANIZATIONS ARE RESHAPING THEIR SUPPLY CHAINS: FROM GLOBAL EFFICIENCY TO LOCAL RESILIENCE

Companies are reshaping their supply chains to withstand a more volatile world. Resilience strategies challenge leaders to navigate the trade-offs between “just-in-time” efficiencies and “just-in-case” contingencies.

Key insights

- After decades of optimizing cost and speed, organizations are now reshaping their supply chains in response to a broad rebalancing of global trade.
- The closure of the Strait of Hormuz is a more recent reminder of how geopolitical risks can impact marine chokepoints and disrupt the flow of global trade.
- Reshoring has become a dominant strategy as leaders rebalance efficiency with better security and control.
- Businesses are diversifying, stockpiling goods and developing alternative routes to avoid common trade-route chokepoints.
- Supply chain strategies turn volatility into opportunity and mitigate disruption, but operating costs grow with each layer of redundancy.



Geoeconomic fragmentation: What's prompted the re-engineering of global supply chains?

Among the many forces shaping global commerce, none connects businesses more directly than the supply chain. For decades, global supply chains followed one organizing principle: efficiency. Companies pursued lower costs and faster production, creating vast networks that powered global growth.

But vulnerabilities were inevitably baked into such lean manufacturing models, fragilities that have become clear in recent years.

The closure of the Strait of Hormuz in March 2026 is a more recent reminder of how geopolitical risks can impact marine chokepoints and disrupt the flow of global

trade. The Strait is a critical passage for 20% of the global seaborne oil supply.

Geopolitics is no longer a background condition for business; it's a core strategic variable that shapes risk, resilience and long-term value.

J.D. Crouch, managing director, Global Strategy, Gallagher

Currently, geopolitical risk, tariff and trade uncertainty, and the rising cost of materials top the list of concerns for global business leaders, according to Gallagher's 2026 Supply Chain risk research. As such, they are taking bold steps to mitigate these exposures and become more resilient and confident to face more uncertainty ahead.

“Organizations are more cognizant of their exposure to suppliers located in regions marked by geopolitical uncertainty,” explains Michael Burg, executive vice president and managing director, Manufacturing practice at Gallagher US. “This awareness is crucial, as it allows companies to identify risks and take steps to address them.”

Despite the attractions of globalization and the ability to tap into lower labor costs in other markets, seven in 10 global businesses are now adopting reshoring strategies to optimize, diversify and “politically de-risk” supply chains.

Multinational organizations are reassessing how and where they operate.¹ Their supply chain transformation starts by reducing their long-standing over-reliance on outsourcing by building more regionally rooted partnerships to navigate evolving alliances and policy pressures.

The shift reflects a broader, ongoing realignment in which governments re-evaluate relationships, balance competing power blocks and respond to rising tensions across trade, tariffs and technology. These dynamics and scenario analysis are shaping business and national-level risk perceptions and complicating corporate decision-making.

“Geopolitics is no longer a background condition for business; it's a core strategic variable that shapes risk, resilience and long-term value. Treating it as a structural condition of the operating environment, rather than an episodic challenge, is essential for effective decision-making,” adds J.D. Crouch, managing director for Global Strategy, Gallagher.

With nearly nine in 10 companies reporting they experienced supply chain losses in the past year, businesses are adapting to protect their operations, adding in contingencies, redundancies and holding on

to additional stock.

These moves for supply chain contingency planning introduce inherent cost pressures, forcing leaders to navigate the tradeoff between protecting balance sheets in the long term and preserving some of the efficiencies of the globalized era.

“Supply chain issues sit at the center of a pyramid of risks. Beneath them lie the events that trigger disruption,” explains Adam Carrier, head of consulting at AnotherDay, a Gallagher company.

“Since global interdependence peaked in 2019, we haven’t seen a collapse, but a steady reconfiguration. The real challenge for businesses is not just knowing who their suppliers are but understanding where their networks operate and what risk events could compromise them.”

Reshaping supply chains: Strategies for resilience

Supply chains are being reshaped by a convergence of geopolitical, economic and technological forces. Diversifying trade partners through friendshoring, onshoring and nearshoring has become a central resilience strategy for business leaders.

Together, these approaches reflect a shift away from a single global rulebook toward a landscape shaped by regional alliances and more transactional, politically informed partnerships.

While businesses face rising challenges — greater uncertainty, increased complexity, trade-offs in costs and uneven access to technology — onshoring and nearshoring offer control and proximity, and friendshoring leverages shared allegiances.

These supply chain optimization strategies aim to reduce exposure to geopolitical shocks, rising material costs and tariff volatility.

At the same time, some governments are adopting protectionist strategies as they compete for critical resources, using domestic subsidies and targeted tariffs to safeguard strategic industries. For business leaders, these strategies create an additional level of uncertainty: In the context of fragmentation, long-standing sourcing relationships can be disrupted overnight. These pressures are driving companies to rethink their operating footprints.

“Expanding your supplier network is essential,” says Brian Cooper, senior managing director of the US National Construction practice, Gallagher. “We advise construction firms to have a clear view of where their materials originate and to broaden their supplier mix accordingly. In many cases, adding more domestic suppliers can reduce the risks, delays and tariffs associated with importing.”

Companies are responding to tariff uncertainty in different ways. Some are delaying investments until policies stabilize, while others are moving quickly to build buffers. Three in five firms report that they’re accelerating decisions by stockpiling goods ahead of expected tariff changes.

“We’re seeing manufacturers reassess their geographic footprint,” adds Burg. “Whether they planned for tariffs in advance or reacted afterward, many are now investing in the US or nearby markets rather than relying as heavily on China and Southeast Asia as they did years before.”

“Balancing cost and benefit has always been difficult in supply chain strategy,” he continues. “Production moved offshore for good reason. Bringing it back to the US, for example, may simplify some risks, but it’s not always economically viable. The challenge is finding the right balance between efficiency and simplification.”

What business leaders are doing to manage supply chain disruptions

The decision challenge: Complexity, tradeoffs and unintended consequences

Many of the factors pushing companies to rethink longstanding sourcing relationships are also making decision-making harder. Trade policy is reshaping global supply chains, and related changes are prompting pivots, such as building short-term inventory buffers.

Leaders must make choices with imperfect information, shifting constraints and competing economic pressures. Supply chain managers may find they’re swapping one exposure for another — reducing potential for geopolitical-led disruptions but facing more delays due to a shortage of truck drivers, for instance.

The central question for business leaders is how much diversification is enough to improve resilience without eroding margins.

Weather- and climate-driven disruptions add further complexity. Trade networks are increasingly planning around canal closures and port congestion, preassigning alternative routes. Globally, aging infrastructure is ill equipped to handle modern climate conditions, and the evolving fuel needs of marine vessels.

“Ports are often at the front lines of climate risk,” says Steve Bowen, chief science officer, Gallagher Re. “We are seeing increasing impacts to aging infrastructure that wasn’t built to comfortably withstand more volatile future climate conditions.”

Friendshoring ambiguity : As disruptions have multiplied, the most forward-looking businesses have shifted from reacting to actively reinventing, strengthening their networks with broader supplier bases and deeper partnerships.

While friendshoring offers political and economic alignment along the supply chain, “friendly” partners carry their own risks, such as capacity constraints, infrastructure gaps or data governance weaknesses. Thus, partners may be politically aligned but not always operationally reliable.

Finding the right balance between adequate diversification of partners without harming the bottom line remains an ongoing tension in executing a friendshoring strategy. In sectors such as manufacturing, onshoring production can mean losing access to low-cost labor. Some of the cost pressure can be offset, to some

extent, through efficiency gains from investing in automation.

The central question for business leaders is how much diversification is enough to improve resilience without eroding margins.

New risk vectors

Diversified sourcing dampens the impact of exporter-specific shocks and improves resilience to tariff and freight volatility. However, shifting production to new inland corridors reshapes the supply chain risk profile.

With nearshoring, for example, exposure to cargo theft — one of the top risks organizations anticipate in the next five years — can increase significantly. One-third of business leaders cite cargo crime and physical-security risks as concerns for both the near and longer term.

Geopolitical volatility and inadequate or aging infrastructure are other sources of risk for companies re-engineering their primary trade routes. The predictability of inland transportation corridors may be just as prone to bottlenecks as marine routes.

Domestic ripple effects

Onshoring and nearshoring can attract jobs and investment, with the impact extending far beyond the production floor. However, human-capital challenges can pose barriers; access and quality of the local workforce still drive investment in new markets.

Notably, one in three businesses report that access to skilled labor is the primary factor influencing their decision to relocate.

Specialist skills and technologies are difficult to replicate. The semiconductor sector in Taiwan, for instance, still produces 90% of the world's most advanced chips, despite efforts in recent years to de-risk. Major projects are underway to establish onshore facilities in the US, such as in the Nevada Desert, but it can take several years for new fabrication plants to come online.

Turning volatility into advantage

In today's polycrisis environment, global businesses operate under a volatile backdrop. Leaders are navigating geopolitical and geoeconomic fragmentation, changing trade rules, climate-driven disruption and mounting cost pressures — all while reshaping supply chains built for a different era.

Business leaders agree: The well-known model of relying on long, globally optimized networks is no longer enough. Resilience has no single formula. To adapt, organizations are leaning on a mix of reshoring, supplier diversification, buffer strategies and targeted risk transfer to future-proof their value chain.

In some industries, where competition for critical resources and technologies continues to intensify, this scenario is even prompting vertical integration to secure future supplies. As such, one of the biggest future threats for many companies is supplier consolidation, resulting in fewer options.

Resilience is about calibration. Having access to data to better map the supply chain — and overlay logistics, geopolitical and peril-based insights — can help companies make better decisions and ensure that every added redundancy earns its place.

"COVID taught companies the importance of pivoting quickly — not just to protect efficiency, but to preserve utilization," says Chris Demetroulis, managing director of the Transportation and Logistics practice at Gallagher. "That muscle memory now shapes how leaders think about sudden change and mitigation.

"Some companies face higher costs in one area but offset them in others," he adds. "It ultimately comes down to each company's global supply chain model and how well they adapt. Those that approach volatility not just as a threat, but as an opportunity to rethink and rebuild, are the ones that move ahead."

Business leaders know they can't eliminate risk, but they can redistribute it. They can diversify suppliers, shorten networks, strengthen regional partnerships and invest in digital tools, like AI in supply chain management, that improve visibility and speed. They can also select business partners that are better aligned to their risk appetite, not just their cost targets.

"For corporate boards and business leaders, insurance must evolve from being a backward-looking financial hedge to a forward-looking strategic tool for resilience," adds Crouch. "Evaluating insurers on their ability to anticipate geopolitical volatility and model systemic disruption is now critical in navigating an increasingly complex global landscape."

Achieving greater diversification will help businesses mitigate the risk of supply chain disruption now and in the future. It's a delicate balancing act, and risk and insurance advisers play a critical role. Brokers are uniquely positioned to provide insights and supply chain risk management solutions that support business leaders as they make decisions to strengthen their supply chain resilience while considering potential trade-offs.

Companies Go More Regional with Supply Chain Investments



Source: Gallagher Redrawing Global Supply Chains Survey

Source: ajg.com



SUPPLY CHAIN CYBER RISK STRATEGIES SHIFT TOWARD RESILIENCE

BRIAN STRAIGHT

As third-party breaches and AI-powered attacks continue to expand, more companies are focusing on business continuity plans

Executive takeaways

- **Third-party exposure is the dominant cyber vulnerability.** Most modern breaches involve suppliers or external partners, and 61% of companies report a third-party breach in the past year—making supply chain transparency a core security priority.
- **AI has compressed the speed of attack and response.** Hackers can penetrate systems in under a minute, while leading organizations now respond within 5–10 minutes. AI is escalating both the threat and the defensive arms race.
- **Resilience, not prevention, is becoming the strategic focus.** With expanding digital attack surfaces and regulatory frameworks like Europe's Digital Operational Resilience Act (DORA), organizations are prioritizing recovery speed, business continuity, and operational restoration over the illusion of perfect prevention.
- **Governance and visibility are the new control tower.** Software bills of materials (SBOMs), minimum-access models, continuous monitoring, and behavioral risk analytics are emerging as foundational tools to reduce cyber exposure across complex supply networks.

For years, cybersecurity was treated as an IT problem to be managed inside the four walls of the enterprise. That framing no longer holds. As supply chains become more digitally connected and increasingly dependent on third parties, cybersecurity has evolved into a core business risk that extends across suppliers, partners, and service providers.

According to Richard Watson, global cybersecurity leader at EY, third-party exposure remains one of the most persistent weaknesses in corporate cyber defenses. Most cyber incidents today, he noted, involve a supplier or external partner somewhere along the supply chain.

That exposure is no longer limited to data theft. State-sponsored and criminal attacks are increasingly capable

of causing real-world operational disruption, shutting down factories, delaying transportation and logistics, and damaging physical assets. New EY data shows that 61% of companies experienced a third-party breach in the past year, underscoring how common and consequential those risks have become.

AI is accelerating both attacks and defenses

The rapid development of AI and agentic AI is reshaping the cyber threat landscape in ways many organizations are still struggling to manage. Watson described this evolution as a double-edged sword: attackers are using AI to generate more sophisticated malware and to identify corporate vulnerabilities faster, while defenders are beginning to use AI to shorten detection and response times.

While leading organizations are now able to detect and respond to attacks in as little as 5 to 10 minutes, Watson said attackers can still compromise systems in under a minute. "Hackers can get in in 52 seconds," he said.

Complicating matters further, organizations are constrained by governance and regulatory requirements that slow defensive changes. Cyber criminals are not bound by those rules, Watson observed, while enterprises often face approval cycles that can take months. In the short term, that gives attackers an advantage.

At the same time, AI is becoming one of the most effective tools organizations have to narrow that gap. Automated detection, identity controls, and response actions such as revoking access or isolating systems are helping security teams reduce the time between intrusion and containment.

Why resilience is replacing prevention

One of the most important shifts Watson expects to see in 2026 is a move away from prevention-only strategies toward a stronger emphasis on resilience.

Rather than assuming attacks can always be stopped, organizations are increasingly planning for how they will recover when incidents occur. Watson said this shift reflects a growing recognition that the attack surface is expanding, driven by cloud adoption, AI, connected

devices, and other emerging technologies, and that perfect prevention is no longer realistic.

“We think the pendulum will shift a little,” Watson said, noting that organizations are spending more time asking how quickly they can restore operations after an attack. “Resilience is about how you get the organization back online,” he noted.

Regulation is reinforcing that shift. In Europe, for example, the Digital Operational Resilience Act (DORA) is pushing organizations to demonstrate not only preventative controls, but also their ability to maintain operations through disruption. For supply chains, that focus on resilience translates directly into reduced downtime, faster recovery, and better protection of service levels.

Visibility and governance across the supply chain

If resilience is the objective, visibility is the prerequisite. Watson emphasized that organizations must understand who is in their supply chain, who has access to their data, and how that access is governed and monitored. As supply chains grow more complex, those questions are becoming harder to answer, particularly as companies rely on cloud platforms, third-party software, and AI-enabled tools.

Among the areas of greatest concern:

- Software updates, which can introduce vulnerabilities if compromised
- Third-party access, often broader than operationally necessary
- Open-source dependencies, embedded deep within commercial software ecosystems

Hidden dependencies, Watson noted, are often where risk emerges.

Practical controls for managing AI-era cyber risk

To address those challenges, organizations are strengthening foundational controls designed to limit exposure and reduce the impact of incidents when they occur.

One area of focus is software transparency. Many companies are now verifying the software they deploy using software bills of materials (SBOMs), allowing them to understand what components are embedded in applications and where vulnerabilities may exist.

Another is tightening system trust. Rather than granting broad access, organizations are moving toward minimum-access models, ensuring that users, suppliers, and AI systems only have the permissions required to perform specific tasks. Watson noted that AI systems require effective access to data and

systems, which makes disciplined access control essential.

Continuous monitoring is also becoming more common. Instead of periodic assessments, leading organizations are using automated tools to monitor suppliers, data flows, and risk indicators on an ongoing basis, using AI to make that monitoring more scalable and cost-effective.

The human factor remains central

Despite advances in technology, the most common cyber risks remain familiar. Phishing still plays a role in roughly 90% of attacks, often serving as the entry point for ransomware or business email compromise, Watson said.

What has changed is how organizations manage human risk. Traditional training focused on teaching employees how to identify suspicious emails. Today, many companies are supplementing that approach with behavioral monitoring, tracking system access, data usage, and activity patterns to identify elevated risk earlier.

This shift reflects a more nuanced understanding of insider risk, one that looks beyond awareness to actual behavior.

What supply chain leaders should prioritize next

Looking ahead, Watson believes organizations best positioned to manage cyber risk will focus on three priorities:

- End-to-end visibility into supply chain partners and data flows
- Strong governance over access, software, and third-party risk
- AI-enabled monitoring and response, used defensively to counter AI-driven attacks

AI, Watson said, is inevitable, much like the shift to cloud computing was several years ago. The challenge is not whether organizations will adopt it, but how they will protect it with the right guardrails in place.

For supply chain leaders, that means treating cybersecurity not as a standalone technical function, but as a shared responsibility tied directly to resilience, continuity, and operational performance. The threat landscape may be accelerating, but so are the tools available to manage it, if organizations are willing to rethink where cybersecurity truly belongs.

Source: SCMR

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ARTIFICIAL INTELLIGENCE IN LOGISTICS 2026: TRENDS, BENEFITS, AND REAL-WORLD OPTIMIZATION STRATEGIES

ANKIT DESAI

Learn how AI in logistics improves forecasting, route planning, warehouse automation, and supply chain visibility while reducing costs and increasing efficiency.

As e-commerce grows, with sales expected to exceed USD 8 trillion by 2027 old logistics models are struggling. They rely on planning and reactive fixes and are finding it hard to survive under pressure from changing demand, geopolitical tensions and sustainability rules.

In such a scenario, artificial intelligence stands as a game-changer in logistics. AI powered analytics and automation can cut costs significantly in this technically forward era. Apart from that, AI also contributes to warehouse management, route optimization, operations execution, and more.

Imagine warehouses working with precision. Trucks changing routes in time to avoid delays. Supply chains predicting disruptions before they happen. This isn't science fiction; it's reality driven by artificial intelligence.

The shift from operations to artificial intelligence-driven systems is a big change. Before spreadsheets and instincts decided inventory and routing. Now artificial intelligence uses lots of data to deliver forecasts and optimizations. This aligns with rising goods volumes being transported from one part of the world to another, some of which even demand same-day deliveries and clear visibility.

Current AI Trends in Logistics : In 2026, artificial intelligence in logistics has evolved beyond basic automation into sophisticated, adaptive systems that drive unprecedented efficiency and resilience.

Leading the charge is agentic AI, autonomous agents capable of executing multi-step tasks without constant human oversight. These systems excel in predictive maintenance, analyzing sensor data from trucks and warehouse equipment to forecast failures days in advance, scheduling repairs proactively to slash downtime.

Similarly, for route adjustments, agentic AI integrates real-time inputs like traffic, weather, and port delays to dynamically reroute fleets, minimizing empty miles and ensuring on-time deliveries even amid disruptions.

A pivotal shift this year is toward connected AI ecosystems spanning warehousing, transport, and procurement. AI in warehouses optimizes picking and inventory via robotics, while transport modules handle dynamic routing, and procurement agents negotiate freight rates based on live market data.

Key AI Applications

Route Optimization : Companies use tools to find the best routes for their trucks because fuel consumption is a major expenditure in the logistics industry. AI tools consider what's happening on the roads in real time like traffic, congestion, and weather to suggest the best time and route of travel, so that the least amount of fuel is consumed

Trimble and Google Cloud are working on such AI tools used in logistics and transportation in general. They are really helpful because they can help the trucking company plan their routes in a few minutes instead of taking hours to do it. This saves the company a lot of time and eventually a lot of money.

Predictive Analytics & Demand Forecasting : Analytics and demand forecasting use machine learning to stop stores from running out of goods and having too much of them. They do this by looking at things that happen outside of the store like what's popular, holidays and how the economy is doing. Past records of how the product performed also plays a role in such decisions.

Then they use this information to figure out how it affects sales. This way is better than the way because it can look at lots of different kinds of information like what people are saying on social media or how the weather is affecting food that goes bad.

Demand forecasting and predictive analytics can get it right 20 to 30 percent more often than the old way. This helps a lot because it can stop stores from losing a lot of money, around USD 1.1 trillion every year.

Warehouse Automation : AI empowers robots to pick, pack and track inventory. This is also called RPA or robotic process automation.

AI guides robots that move around the warehouse. These robots help reduce mistakes when picking items. They also help reduce the time and human intervention it takes to complete a cycle by forty percent.

Further, the use of RFID and digital copies of the warehouse run by AI helps keep track of inventory with high accuracy. This accuracy eliminates the need for workers to manually count items. It also helps predict when to restock items.

Real-Time Tracking & Visibility : Real-time tracking helps us see where our goods are. It uses AI powered surveillance to spot defects on packages during delivery at docks or during last-mile delivery.

Computer vision checks packages for damage while they are being transported. If it finds any issues it flags them immediately so we can fix the problem either by rerouting the package or compensating the customer.

AI powered blockchain makes sure deliveries match orders perfectly with no mistakes. This complete visibility helps reduce theft, which can be up to 5% of the cargo value.

Benefits and ROI

Cost Reductions : The use of Artificial Intelligence saves money by making every part of the supply chain more efficient. From predictive maintenance to operational optimization and strategizing, there's nothing that AI cannot contribute to.

Artificial Intelligence can also find the routes for vehicles, which reduces the amount of fuel we use. And fuel is the biggest cost that can matter in logistics. By doing this the fuel expenses can be significantly cut. Businesses also use AI to stock or restock products as well as manage warehouses using robots and IoT. Getting human workforce to get all these done would cost significantly and leave room for error.

Faster Decisions : Time artificial intelligence analytics helps to make decisions really fast, in just a few hours.

When all the systems are connected together they can look at an amount of information that comes from Internet of Things sensors, weather information and market updates.

This gives us information in real time that can be acted upon instantly like changing routes, ordering products, recalling deliveries, and more. It also helps companies stay ahead of their competitors when things are changing quickly.

Sustainability Gains : Using intelligence to plan the best routes for vehicles reduces the amount of fuel that is used. This can lower the pollutants that we put into the air called Scope 1 emissions by 15 to 20 percent. This is what many countries are doing, like the European Union with its ETS rules for ships.

Artificial intelligence in warehouses is also very helpful. It makes sure that unnecessary energy is not wasted by using lighting and scheduling robots at the right time.

Real-World Case Studies

DHLs AI Route Optimization : Challenges: DHL faced rising fuel costs and delays from traffic, weather, and port bottlenecks in global shipping, eroding customer trust during peak seasons.

Solutions: Deployed AI-driven route optimization via Resilience360 platform, integrating real-time IoT data, weather APIs, and machine learning to dynamically reroute 100,000+ daily shipments across 220 countries.

Maersks Agentic AI for Carrier Evaluation :

Challenges: Maersk struggled with inconsistent carrier

performance evaluation, manual bidding processes causing 10-15% overpayments and unreliable global lanes amid Red Sea disruptions.

Solutions: Implemented agentic AI that autonomously scores carriers on metrics like ETA accuracy, cost, and sustainability via multi-step workflows. These self-executing systems analyzed historical data, live tracking, and market rates to negotiate and select optimal partners.

DEO Framework at a Global Manufacturer

Challenges: A Fortune 500 firm grappled with siloed decisions across procurement, warehousing, and transport, leading to \$50M in excess inventory and reactive crisis management.

Solutions: Adopted Decision Engineering Optimization (DEO), structuring AI around key decisions. Traceable models integrated unstructured data (e.g., emails, news) for enterprise-wide outputs.

Implementation Steps

- Begin by defining precise objectives, such as boosting forecasting accuracy or cutting route deviations directly tied to KPIs.
- Next, adopt decision-first frameworks like DEO (Decision Engineering Optimization). This approach engineers AI around critical decisions using modular, auditable models.
- Then, integrate targeted AI tools gradually. Start with proven platforms like FourKites for routing optimization and o9 Solutions for analytics, piloting on 10-20% of operations to gather data and refine algorithms before enterprise rollout.
- Finally, scale to connected systems through API orchestration, linking warehouse management systems (WMS) with transport management systems (TMS) and ERP for holistic visibility and automated handoffs, unlocking network-wide efficiencies.

Future Outlook : Looking ahead to late 2026 and beyond, AI in logistics will see explosive convergence of AI, SaaS platforms, and robotics, birthing hyper-efficient, autonomous warehouses and supply chain operations.

Agentic AI will evolve into "swarm intelligence," where robots self-coordinate for picking, packing, and sorting without human input, integrated with predictive procurement for zero-waste operations. Edge computing ensures millisecond decisions amid 5G latency, while multimodal AI fuses vision, IoT, and blockchain for unbreakable supply chain resilience.

By 2027, expect 70% of global warehouses to adopt this trifecta, driving 25% emission cuts and \$500B in efficiencies, paving the way for fully ambient logistics where humans focus on strategy.

Source: theintechgroup.com

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BRANCH NEWS

NEW DELHI BRANCH

Indian Institute of Materials Management Delhi Branch organised a seminar on “Public Procurement - Value Creation by Policy & Practice for Developed India” on May 23, 2026 at Hotel Le Meridien, New Delhi, to deliberate upon various aspects of Public Procurement in India. The seminar was attended by about 150 delegates including many Senior Officers of General Manager and above level, from Govt. and PSUs. Shri Srideb Nanda, Special Invitee to Executive Committee, was the master of the ceremony and he informed about IIMM and its national and international activities, related to the growth & development of the executives, from the different domains of supply chain organisations.

Shri Sanjeev Kumar Bhatia, Chairman of IIMM Delhi branch informed about the various activities of Delhi branch and welcomed the guests, speakers and participants.

Shri H K Sharma, Seminar Chairman & Former Additional Director General (Supply) Ministry of Commerce and past national president of IIMM, ignited the spirit of seminar and highlighted the trends, in public procurement, particularly the legislative, judicial, executive and technology related trends and the international trends. He further highlighted present weaknesses and future necessities of public procurement and the strategic planning for the same, in view of likely GDP of USD 30Trillion by 2047-A vision for Atmanirbhar Bharat. He emphasised to have a critical look at various types of value creation, values for various stake holders and various policies contributing towards value creation. ESG, Public Policy, alignment of policies with public policy objectives etc.

KEYNOTE SPEAKER for the seminar, **Mr. Mihir Kumar, Chief Executive Officer,** Government e-Marketplace, Govt. of India, shared with the house, the relevance of GeM platform of the government, in meeting the various objectives related to public procurement, by different government departments and PSUs/CPSUs and continuous improvement of GeM for future procurement needs.

ONLINE FROM USA: KEYNOTE SPEAKER for the seminar, **Mr. Vinay Sharma,** former Director of Public Procurement of World Bank highlighted the international perspective to public procurement, international experiences of various policy and practice changes and the needs and relevance of the same for India. He elaborated on the role & impacts of various free trade agreements being concluded by India on Public Procurement. He elaborated likely impacts of climate change and ESG protocols on public procurement.

CHIEF GUEST of the seminar **Lieutenant General Mukesh Chaddha, AVSM, VSM, SM, and presently DGST in Indian Army,** highlighted the importance of strategic planning for the timely, quality and cost effective supply of materials and services in general and specially for the various critical operations of the armed forces. He also stressed upon the importance of meticulous planning aspects, and its perfect execution, through a synergised team effort, for meeting the critical needs of the armed forces. He also discussed the need of use of technology, smart contracts, and reduction of lead time etc., for the future needs for public procurement for developed India.

Shri Shailendra Singh, Deputy Director General from CPWD and former CTE(CVC) highlighted the role of works contracts for developed India and the necessary measures to be taken in public procurement for the same as about 90% public procurement is procurement of works.

He stressed upon the review of various policies and practices related to public procurement.

He also stressed upon the relevant change, in the present day thinking and working methodology of the vigilance- from the previous era of punitive vigilance, to the present day era of preventive vigilance, with a future way forward- the participative & collaborative vigilance. Shri Shailendra Singh emphasised upon the need for capacity building for works contracts and particularly for the vigilance activities.

Shri Ashok Kumar, Chief Technical Examiner in Central Vigilance Commission, highlighted the role of vigilance and other similar agencies in public procurement and in reducing corruption and the saving of the public funds, for the overall economical development of the country. He highlighted public procurement and the experiences in CVC by way of several related case studies.

Shri Rakesh Maheshwari, Former Senior Director and Gp Coordinator Cyber Laws, Cyber Security and Data Governance, Ministry of Electronics and IT, Govt. of India highlighted the relevance of Cyber Security, Cyber Laws etc. in the different domains related to public procurement. He particularly emphasised upon the role of technology and the upcoming / emerging trends, in the various facets, related to public procurement.

Shri Kanwalpreet, Executive Director, Railway Board, Ministry of Railways, highlighted the latest policy changes in the public procurement and the need for future policy related changes, to meet the challenges of developed India.

Mr. Prakhar Deep, Principal Associate, Shardul Amarchand Mangaldas & Co. highlighted the Emerging Legal trends in the different public procurement

perspectives, in public sector / Government and various elements necessary in the procurement for the developed India.

He also narrated the relevance of effective contract execution / contract management and the different effective dispute resolution mechanisms, through various relevant case studies, highlighting & citing the previous related orders, from the Supreme Court/ State High Courts etc. He also highlighted various aspects regarding appointment of Govt. and PSU Offices as arbitrators. He discussed in detail the various aspects of claims of damages, particularly the liquidated damages and penalty.

Shri Suresh Madhavan, Chief General Manager, ONGC highlighted on the public sector perspective and the various elements, necessary in procurement, for the developed India. He also stressed upon the CPSU perspective, (with particular emphasis on ONGC) in achieving various MOU targets related to public procurement. He brought out the relevance of suitable value creation through effective policies & practices, so as to achieve the ultimate vision of Atmanirbhar Bharat.



Mr. Srideb Nanda, EC Member, IIMM Delhi and the master of ceremony for the full day event, summed up the day's proceedings of this seminar, while conducting the Valedictory Session.

He brought out and re-iterated with the house, the various important strategic takeaways, as discussed by the different prominent speakers.

In particular, the critical role of public procurement, in meeting the timely, quality and cost effective supplies (materials and services), along with also meeting with different GOI guidelines, was also re-stressed upon,

review of policies and practices, role of technologies and capacity building and vigilance.

Shri Himanshu Vashishtha, DGM (NSIC) proposed the **Vote of thanks**. In particular he thanked all the related stakeholders, participants, speakers and Chief Guest and organising team and the sponsors.

The seminar ended with a determination by participants for taking innovative actions in public procurement for making contribution for developed India by focusing on public procurement by 2047 and lastly by singing **National Anthem**. Wide publicity was given to the seminar in print and electronic and digital media before the seminar and after the seminar and in IIMM circles groups etc.

CHHATRAPATI SAMBHAJINAGAR BRANCH

MM Week 2026 Celebration : Theme:

"Future Supply Chain in an AI-Driven Era"

Duration: 17th April to 23rd April 2026

The Indian Institute of Materials Management (IIMM), Chhatrapati Sambhajinagar Branch, successfully celebrated **MM Week 2026** from 17th April to 23rd April 2026 with a series of insightful webinars and brainstorming sessions aligned with the theme "Future Supply Chain in an AI-Driven Era."

The IIMM Chhatrapati Sambhajinagar team organized multiple knowledge-sharing programs during the Materials Management Week, which received an overwhelming response with record participation from industry professionals, academicians, and students. The programs were conducted online as well as at the IIMM Excellence Training Centre, Chhatrapati Sambhajinagar.

All sessions were thoughtfully designed to address emerging trends and challenges in supply chain and procurement management in the AI-driven business environment.

Program Highlights

Program 1 – 17th April 2026

Webinar: "Building Resilient Supply Chains in an Age of Uncertainty"

Speaker: Mr. Ram Raghuraman, Director – Chennai ISM India and Founder, BCube Global Solutions.

Program 2 – 18th April 2026

Webinar: "Cost and Price Management: Key Skills for Procurement Professionals"

Speaker: Mr. Pradeep Khetan, Corporate Trainer and Director (Western Region), Institute of Supply Management (ISM).

Program 3 – 18th April 2026

Webinar: "Digital Maturity Roadmap in Procurement Transformation"

Speaker: Dr. Swapnil Dubey, Ex-Head Procurement, Yes Bank and Chairman, IIMM Mumbai Branch.

Program 4 – 19th April 2026

A video presentation showcasing the success story of supply chain management at Anand Milk Union Limited (AMUL) was shared. This initiative was undertaken by Branch Chairman Mr. Sushant Patare.

Program 5 – 22nd April 2026

Webinar: “What Makes an AI Agent ‘Real’ and How It Can Transform Enterprise Planning”

Speakers: Mr. Jalani Venkatesan, Senior Director of Finance Transformation at HubSpot, and Ms. Leigh Romeo, VP & Head of AI Product Management at Anaplan.

Program 6 – 23rd April 2026

MM Day was celebrated with a brainstorming session on “Promotion of Online Short-Term Courses.”

The session was addressed by Branch Chairman Mr. Sushant Patare, who briefed participants about the branch activities and key focus areas of IIMM. He also appealed to delegates who are not yet members to join IIMM and contribute to the professional community.

Participation and Industry Presence : Around 300 participants attended the various programs during MM Week 2026. The participants represented leading industries and organizations including Endurance Group, Sanjay Group, Bagla Group, Marathwada Auto Components Pvt. Ltd., Endress+Hauser, BG Fastening, Dhananjay Group, Mauli Metal Industries, Saurabh Group, Jain Precision, Nandmuri Group, SMB Engineers, Som Autotech, Forbes & Company, Man Logistics, SEPL, Warner Electronics (I) Pvt. Ltd., Specialty Poly Films, Wockhardt Ltd., and several automobile ancillary units based in Chhatrapati Sambhajinagar.

Faculty members and students from engineering colleges, along with vendors associated with these industries, also actively participated in the webinars.

Guidance and Organizing Team : National Council Members Mr. Sanjay Sanghai, Mr. Narendra Joshi, and Mr. Srihari Kanthamani guided the IIMM team throughout the MM Week celebrations.

The event was successfully organized under the leadership and efforts of:

- Mr. Sushant Patare – Chairman
- Mr. Shrikant Muley – Vice Chairman
- Mr. Paras Mutha – Hon. Secretary

along with Executive Committee Members Mr. Phanikumar, Mr. Ravi Kathavi, Mr. Abhay Kulkarni, Mr. Sushil Pande, Mr. Sudhir Patil, Mr. Milind Ghogale, Mr. Lalit Lohade, Mr. Prem Kadam, Mr. Pankaj Jirimili, Mr. Sunil Ved, Mr. Sourabh Vaidya, Mr. Sudarshan Dharurkar, Mr. Amey Kolte, Mr. Ramesh Jaulkar, Mr. Ravindra Mohite, Mr. Datta Khodse, and Mr. Chetan Borse. Their collective efforts ensured the grand success of MM Week 2026.

DEHRADUN BRANCH

We are pleased to acknowledge with gratitude the blessings, encouragement, and continuous support of all

IIMMians, whose valuable contribution has been instrumental in the successful organizing of MM Day.

The Dehradun Branch celebrated MM Day with great enthusiasm and success. The event witnessed the presence of several eminent personalities. On this occasion, Mr. K. B. Kashyap, retired from ONGC, delivered an insightful lecture on Supply Chain Management and its practices across various organizations.

As part of the celebration, the branch also extended a thoughtful social gesture by distributing juice, chips, and snacks to a group of orphaned children in the city.



MYSURU BRANCH

On the occasion of Materials Management Day April 23, 2026, the Indian Institute of Materials Management (IIMM), Mysuru Branch, successfully conducted the event on May 2, 2026 at Hotel Le Ruchi The Prince and brought together senior Materials and Supply Chain Management professionals from industries across Mysuru for an interactive session, felicitating them with

citations in recognition of their decades of contributions to cost optimisation, quality enhancement, supply chain excellence, and innovations in materials management, aligned with the nation's 'Make in India' vision in the automotive and defence sectors.



The event saw enthusiastic participation from leading organisations including Triton Valves Ltd., IT Champs Pvt. Ltd., BEML Ltd., Balaji Auto Tech Pvt. Ltd., and TTM Technologies. Equally underscoring the importance of industry-academia collaboration, the Dean, HOD, and students of the Department of Business Administration, VVCE Mysuru, and the HODs of Mechanical Engineering, ATME College of Engineering, Mysuru, participated actively in the interactive session.

The event also marked the induction of three new

members — Mr. Guru Prasad N S (Manager – SCM, TTM Technologies), Prof. (Dr.) P.S.V. Balaji Rao (Dean, MBA Department, VVCE Mysuru), and Dr. Somashekar I C (HOD, MBA Department, VVCE Mysuru) — into the IIMM Mysuru Branch.

The event presided by Mr. R. Nanjunda Naika – Chairman (Centre) flanked by Mr. M. N. Suresh-Immediate Past Chairman (Right), Ravindranath Shiroor-Vice Chairman, and Mr. Rajesh Kutnikar –Treasurer to his left in the GROUP PHOTO, followed by lighting of the lamp, new member recognition and citation awarded for significant contributions by senior professionals in materials management and supply chain management.

VADODARA BRANCH

IIMM Vadodara celebrated Materials Management (MM) Day on 23rd April, 2026. : IIMM Vadodara Branch Celebrated MM Day with Theme “**Future of Supply Chain in AI driven era**” at the Crystal Hall, Hotel Grand Mercure Vadodara Surya Palace on 23rd April 2026 from 6.00 pm to 8.30 pm. Shri Meghav Mehta, CEO & Executive Director – Deepak Chem Tech Limited was the Chief Guest

Dr. Bharti Trivedi, in her welcome address briefed about the Branch Activities. Also, in her speech on “Impact of AI in Indian Industries” she explained how AI impacts in Indian Industries, Chat GPT, IT & Software Services, Manufacturing, Agriculture, Healthcare, Finance & Banking. Cash awards in the name of the late Shri H.M. Bhatt were announced for the first- and second-rank students of PGDMM (Post Graduate Diploma in Materials Management). 1st Ranker – Mr. Suyash Jaykumar Desai - Rs.8,000/- & 2nd Ranker – Mr. Pavan Kumar Ajmera Rs.7,000/-

During the MM Day celebration, the new textbook “Basics of Computer Applications & Information Technology”—which is now Paper-5 of the one-year PDSM course—was launched; this book was compiled by Dr. Bharti Trivedi.

Felicitated New Life Members in the function.

The Programme was followed by delicious dinner.



Inauguration by lighting the lamp



Welcome speech by Chairperson-Dr. Bharti Trivedi



Chief Guest Shri Meghav Mehta addressing the gathering



MM Day Function



Felicitations of Chief Guest



Launching of New Book on “Basics of Computer Applications & Information Technology”

IIMM Vadodara organized Alumni Meet-2026 on May 3, 2026.

The IIMM Alumni Meet-2026 was successfully organized on May 3, 2026 at 5th Avenue, Hotel Grand Mercure Vadodara Surya Palace, Vadodara. The meet was conducted to strengthen Alumni–Institution relations. The Alumni Meet aimed to reconnect alumni with the institution and faculty, provide a platform for sharing experiences, and encourage active involvement in IIMM activities through official membership.

Alumni from the Graduate Diploma, Postgraduate Diploma, and MBA batches spanning 1988 to 2025 gathered with faculty members for a heartwarming reunion to reconnect, network, and relive their golden student days. The programme commenced at 10:00 AM with the registration of alumni, inauguration of the event by lighting lamp, followed by informal interaction among alumni, faculty members, and the EC Members.

The inaugural address was delivered by Dr. Bharti Trivedi, Chairperson of the Institute. In her address, she emphasized the vital role of alumni as key stakeholders in institutional growth. She highlighted the importance of alumni support in industry collaboration, and academic enrichment, and appreciated the continued association of alumni with the Institute.

The presentation featured each Alumnus’s professional background, achievements, and IIMM course details. Additionally, special mementos were presented to every Alumnus and Faculty member. During the interaction session, alumni shared their professional journeys, industry experiences, and memorable moments from their student life. The session was highly interactive and provided valuable insights for faculty members and students, motivating them towards professional excellence. The faculty members also shared their valuable insights.

The programme concluded with a formal vote of thanks proposed by Mr. Rakesh Desai, Vice Chairman of the Institute. He expressed sincere gratitude to all alumni, dignitaries, faculty members, EC members for their valuable presence, guidance, and cooperation in making the event a success. The programme was followed by Lunch at 1:45 PM. Glimpses of Alumni Meet-2026





Evening Lecture on “Jago MSME in Making Bharat a Developed Nation”

IIMM Vadodara Branch successfully organized an engaging Evening Talk on the topic **“Jago MSME in making Bharat a Developed Nation”** by Dr. Prasanta Gupta on May 16, 2026 evening at IIMM Hall.

Dr. Prasanta Gupta is an accomplished professional and a seasoned leader, currently serving as Executive Vice President and Chief Procurement Officer at Aarti Industries Limited (AIL), a specialty chemical giant in India. Dr. Gupta is recognized in industry and academia as a thought leader, one who brought Science into the Art of Procurement. Dr. Gupta is a member of the Council of Supply Chain Management Professionals (CSCMP) in USA. He is also a member in the Board of Studies of the Indian Institute of Materials Management (IIMM).

About the Lecture:

The session was very interactive and the speaker explained that Micro, Small and Medium Enterprises (MSMEs) form the backbone of India’s productive economy, anchoring growth, employment, and regional balance in the journey towards Viksit Bharat. Contributing nearly one-third of India’s GDP and about 45% of manufacturing output, MSMEs act as vital linkages between agriculture, industry, and services. They are the largest generators of non-farm employment—especially for women, youth, and informal workers—thereby deepening social and economic inclusion. By driving innovation, local entrepreneurship, and export competitiveness, MSMEs bolster India’s resilience against global economic volatility.

Glimpses of the Evening Talk



NALCONAGAR BRANCH

Indian Institute of Materials Management (IIMM), Nalconagar Branch celebrated “ Materials Management (MM) Day” on 10 th May 26, Sunday,at CSIR-IMMT, Bhubaneswar with a Seminar on “ Future of Supply chain in AI driven Era”.

The programme was graced and inaugurated by Dr.Ramanuj Narayan, Director,CSIR- IMMT, Bhubaneswar

as Chief Guest. In his inaugural address, Dr. Narayan focused on the benefits of application of AI in the entire functional domain of Supply chain Management. His professional supportive eloquent talk immensely encouraged the participants from across the state.

Prof. Subhankar Mishra, School of Computer Sciences, NISER, Bhubaneswar and Air Commodore Mr. Niranjana Kumar Parhi (Retd.) addressed the galaxy of SCM professionals as Distinguished Speakers. While Prof. Mishra delivered an insightful speech on sequence problems in the context of Artificial intelligence (AI), he explained how AI can solve such problems using various algorithms when managing Supply chain with illustration of examples.

Air Commodore Mr. Niranjana Kumar Parhi (Retd.) delivered a highly relevant talk on current crisis and challenges in supply chain that AI can help/ address. He also discussed the security consideration that organisations must take in to account when using AI algorithms. Executive committee members, members and Institutional Members of the branch and delegates in large numbers from different industries and corporate Business School joined this seminar on a timely relevant contemporary theme and deliberated. At the outset, Dr (Er) Dibakar Swain, Chairman of the branch placed functional activities of IIMM and Nalconagar Branch in particular. Dr. Swain welcomed all participants from across the state to this august programme. He sought the support of all for promotion of this profession and professional body in the state and across the country.

Dr. Swain also presented a very brief profile of the chief guest, Dr. Ramanuj Narayan and introduced him to the learned august audience.

Mr. Anshuman Dash, Vice- Chairman of the Branch presented the brief profiles of the distinguished Learned Speakers, Prof. Mishra and Air Commodore Mr. Niranjana Kumar Parhi (Retd.) and introduced them to all present.

The programme turned to be a grand successful event due to full co- operation of the executive committee, all members including Institutional Members of the branch.

While Mr S. N. Baghar, Hon. Secretary of the branch offered vote of thanks, Ms. Arati D. Patra, Executive committee member of the branch anchored the programme very successfully as master of ceremony.



HYDERABAD BRANCH

IIMM Hyderabad Branch celebrated Materials Management Day 2026 on 26.04.2026 at FTCCI with high enthusiasm with the Guests of Honor, VIPs, Respected Life Members, Student Scholars and Vibrant EC Team. The Guest Lecture on “Future of Supply Chain in the AI Driven Era” a relevant theme for the present day Supply Chain Managers delivered by Mr Aniketh Yerra, Category Manager at Novartis.

As our Founder (Late) Dr V Venkat Reddy Sir use to often say that “Materials Management is not only about managing stores or purchase and so on., it is about managing value for the Nation”. Every Student we train, every seminar we conduct, is a step towards that Vision.

The MM Day is not just about speeches. It is about celebrating the spirit of Supply Chain. So, we made the Day Intellectually Bright and joyful by presenting Awards to the Merit Students of Jan 2024 Batch and also, the Best Student Awards in both the streams. Mementos to the Girl-Students for winning the games conducted on Womens Day.

The MM Day was also made highly memorable with the

speeches of Guests of Honor and the Chair-Person, Mrs S Suvarna.

****The Celebrations concluded with full of zeal to drive IIMM to a great heights with the able guidance of our NP, Mr Biddappa and NEC Team and happiness of interaction with each other. Special thanks to our MM Day Convenor, Mr A Preetam Kumar and the entire EC Team, with whose support, encouragement and participation, this was made possible.**



KOLKATA BRANCH

Indian Institute of Materials Management (IIMM), Kolkata Branch observed this year's Materials Management Day on Thursday, 23rd April, 2026 at IIMM hall in a most befitting manner. Theme of this year's MM Day was "Future on Supply Chain in AI driven era".

Mr. Prasun Ganguly, Hony. Secretary, IIMM Kolkata Branch and Chairman Membership Subcommittee conducted the program, which started at 6:30 p.m. It was well attended by dignitaries, members, many past and present students.

Mr. Anup Kumar Dey, Honourable Vice Chairman, IIMM Kolkata Branch delivered the inaugural speech. In his

speech he has described the role of our Institute and about today's topic.

Next part of our program was felicitation to the honoured guests. It was done in a very graceful manner, Uttarios, Flower bouquet and mementos were offered to the respective speakers as a token of respect.

Since it was the foundation day of IIMM, we have arranged a cake cutting ceremony. The cake was beautifully designed with IIMM Logo. Everybody enjoyed the ceremony.

The following distinguished guests and students members were among the speakers of today's topic "Future on Supply Chain in AI driven era".

Mr. Nitin Bhatlekar, Chief Procurement Officer, Texmaco Rail and Engineering Ltd.

Mr. Kaushik Banerjee, Head of Information Technology, Star Cement Ltd.

Mr. D. N. Chakarvarti, Past Chairman and VP East of IIMM, Kolkata Branch.

Ms. Riya Bhattacharyya, Working in HPL- Student member of IIMM

Mr. Krishanu Bag, working TCPL- Student member of IIMM

This year also we have selected few student members as the speakers of today's topic to encourage them.

All the speakers expressed their personal views about the topic in a very decent manner. Their deliberations were appreciated by all.

MM Day celebration was concluded by a Vote of Thanks by Mr. Joydip Basak. Hony. Treasurer, IIMM Kolkata branch followed by Hi- Tea.



RAJKOT BRANCH

Event Report on the Grand Success of Industry 4.0 Roadshow of IIMM Rajkot Branch. on 18th May 2026

The Industry 4.0 Roadshow – Rajkot, organized under the RAMP Scheme of the Government of India and Government of Gujarat initiative for "Scaling Up Industry 4.0 Transformation in Gujarat's Manufacturing Sector," concluded with grand success on 18th May 2026 at the Centre of Excellence – Industrial Engineering Association, Metoda, Rajkot.

The event witnessed the enthusiastic participation of more than 52 eminent industrialists, MSME owners, business leaders, institutional representatives, and professionals, reflecting the growing interest of Gujarat's manufacturing sector towards digital transformation and smart manufacturing.

The program was organized by the National Productivity Council (NPC), Government of India, with the support of Lodhika GIDC Association and Indian Institute of Materials Management (IIMM), Rajkot Chapter, and coordinated by the Centre for Workplace Excellence.

The event commenced with a warm welcome address by Mr. Narendra Jadeja, President, Lodhika GIDC Association, who graciously welcomed all distinguished guests and participants. He emphasized the importance of embracing technological advancements to strengthen MSME competitiveness and sustainability in today's rapidly changing industrial environment.

Mr. Chandan Choudhary, Deputy Director, National Productivity Council (NPC), elaborated in detail on the RAMP Scheme and the visionary initiative of the Government of Gujarat for implementing Industry 4.0 practices among MSMEs. He informed participants about the valuable support available under the scheme, including free consultation, expert guidance, and equipment support for eligible industries to accelerate their digital transformation journey and improve productivity, efficiency, and global competitiveness.

Mr. Amit Saluja delivered an insightful session focusing on digitalization and its transformative benefits for industries. He highlighted how adoption of digital technologies enhances operational efficiency, reduces wastage, improves productivity, enables real-time monitoring, and strengthens overall business performance.

Representing the Indian Institute of Materials Management (IIMM), Mr. Pankaj Panchbhai, National Secretary & Treasurer (NST), delivered an impactful address on the correlation between Industry 4.0, Supply Chain, and Procurement Management. He explained that supply chain is the backbone of manufacturing, while Industry 4.0 provides intelligence to the supply chain through Artificial Intelligence (AI), Internet of Things (IoT), Big Data Analytics, Automation, and Smart Manufacturing Systems.

He elaborated on how Industry 4.0 is transforming procurement and supply chain functions by enabling:

Predictive procurement and demand forecasting instead of reactive planning

Real-time visibility and transparency across inventory and supplier networks

Smart supplier management through performance-based analytics

Cost optimization and operational efficiency through automation

Data-driven decision-making for faster and better

business outcomes

He further emphasized that digital transformation is no longer optional but essential for survival and growth, especially for MSMEs striving to remain globally competitive.

During his address, Mr. Pankaj Panchbhai highlighted the significant contribution of IIMM towards national growth and professional development in Supply Chain, Procurement, Logistics, and Materials Management. He proudly mentioned that IIMM has successfully organized more than 50 programs on Industry 4.0 during the last five years, reflecting its strong commitment toward industry awareness, skill enhancement, and knowledge dissemination.

A live and highly engaging demonstration of IoT equipment was conducted by Mr. Tarun Purohit, providing participants with practical exposure to smart industrial technologies and their real-world applications in modern manufacturing systems.

The event was further enriched by the gracious presence of Mr. Kantesaria Sir, a respected mentor and guide, whose valuable presence added dignity and inspiration to the program.

Mr. Hitendra Patel, Chairman IIMM Rajkot briefed the audience about the various activities, educational opportunities, and professional benefits offered by IIMM and passionately appealed to participants to become members and join the institute for continuous professional growth and learning.

Further strengthening the engagement, Mr. Nilesh Kikani, National Council Member of IIMM, distributed IIMM kits and newsletters to participants and addressed several queries related to IIMM membership, educational programs, and professional development opportunities.

Special appreciation was extended to Mr. Vijay Patel, who played a crucial role in successfully organizing and coordinating the entire event.

Last but certainly not the least, Mrs. Vaishali Parikh received a standing ovation from all participants for her tireless efforts, dedication, and outstanding contribution in making the entire event a grand success—from meticulous planning to flawless execution. Her commitment, leadership, and passion were widely appreciated by all dignitaries and attendees.

The event concluded on a highly positive and collaborative note with an engaging networking high tea session, where participants interacted, exchanged ideas, explored opportunities for collaboration, and discussed pathways for implementing Industry 4.0 technologies in their respective organizations.

The grand success of the Industry 4.0 Roadshow – Rajkot reaffirmed the collective commitment of industries, institutions, and policymakers towards building a future-ready, digitally empowered, and globally competitive manufacturing ecosystem in Gujarat and India.



GREATER NOIDA BRANCH

On the occasion of Materials Management Day (23 April 1975), the Indian Institute of Materials Management Greater Noida Branch successfully organized a knowledge-sharing session on 26 April 2026 at Venice Mall, Greater Noida, with an enthusiastic participation of around 30 members and invitees from Academia and Industries

The program was gracefully anchored by Sh. Ageet Kumar (NC-1) and commenced with the welcome address by Sh. K. P. Singh (Chairman), highlighting the role of IIMM in nation-building through excellence in Materials Management, Logistics, and Supply Chain.

We were privileged to have insightful sessions by distinguished speakers:

Prof. Dr Manmohan Rahul & Prof. Harishankar (Sharda University) – on AI and its role in a developed India

* Sh. Sushant (IIMM Chandigarh) – on transition towards AI & BI

* Prof Dr. Suresh Kumar Sharma (Former National President, IIMM) – on the journey and legacy of IIMM

* Sh. Sunil Kumar Sharma (Former Chairman, Greater Noida; GM, AAI) – presentation on Jewar Airport and its logistics potential

* Dr. Gyanendra Pratap Singh (Sports Authority of India) – on health & wellness for professionals

* Sh. Ranveer Kumar (Hony. Secretary, IIMM Greater Noida; PDIL) – on MDP, personality development & life balance

The event reinforced the importance of continuous learning, digital transformation, and holistic development for strengthening our profession and contributing to national growth.



COCHIN BRANCH

MM Day Celebrated at Seapark Hotel, Cochin. Inaugurated by Dr M.P. Ramnavas, Project Director, Kochi Metro Rail Ltd.

Seminar at Renai Cochin (23-4-26) by IIMM on Artificial Intelligence for Exporters, Manufacturers, Purchase and Logistics Professionals.



Felicitation of Eminent Personalities By IIMM-Kolkatta Branch. 23rd May 2026



N K KABRA

- Shri Narendra Kabra is a seasoned industrial leader with over 36 years of rich experience in mineral processing, mining operations, supply chain management, and large-scale manufacturing.
- He holds an MBA in Logistics, Materials & Supply Chain Management from the Indian Institute of Materials Management, along with a Bachelor's Degree in Commerce.
- He currently serves as the Managing Director of SMDC Minerals Pvt. Ltd. and Murlidhar Silica Pvt. Ltd., companies engaged in the mining and processing of China Clay and Silica Sand in Gujarat.

- Over the course of his distinguished career, he has held several senior leadership positions with reputed organizations including Hindustan National Glass & Industries Ltd., Frigoglass, and HNG Float Glass Industries Ltd. (now Siseecam), where he played a pivotal role in supply chain transformation, strategic procurement, budgeting, operational excellence, and capacity expansion initiatives.
- Shri Narendra Kabra is widely recognized for pioneering the commercial utilization of silica sand that was previously discarded as waste by China Clay mine owners. Through his visionary approach and industry insight, he transformed this overlooked by-product into a valuable industrial raw material, creating a significant "waste-to-wealth" success story.
- In recognition of his contribution to the industry, he was honored with the prestigious Udyog Bharti Award in 2021.
- Today, more than 300,000 tons of silica sand from the Bhuj region are supplied across India, contributing substantially to the mineral and glass manufacturing ecosystem.
- His inspiring entrepreneurial journey and innovative contribution to sustainable industrial practices were also featured as a cover story in Business Outlook magazine.



Dilip Shah

More than four decades have passed since Prof. Dilip Shah started teaching. Sheer passion persuaded him. He is presently the Rector and Dean of Student Affairs of the college and is perhaps the most recognised face within and outside of the Bhawanipur College.

During his career, he has passed through both business and profession. In professional work he has handled Taxation to company law matters as also projects and finance. He has occupied varied positions in different organisations including being Director, Vice President and an adviser or consultant.

Prof. Shah has also been the Founder Convenor of the Youth wing of the prestigious Bharatiya Bhasha Parishad and has organised innumerable events for the parishad. He has also co-founded a youth group called DISHA which does social work.

He happens to be one of the most sought after faculties at the regional level of all the three professional (statutory) bodies in commerce namely, The Institute Of Chartered Accountants Of India, The Institute Of Company Secretaries Of India, The Institute Of Cost Accountants Of India. He has also spoken extensively at various management institutes, chambers of commerce, clubs and associations in India.

He has been a part of the training and education committee of ICSI for over twenty five years. Presently he is on the IGRP of the National Stock Exchange, MCXs, and the clearing corporation.

Prof. Shah is a qualified member of the Institute of Company Secretaries Of India and is also a graduate in law. He is proud to serve his Alma mater from where with honours he graduated in commerce many years ago.

"He believes 'service before self'"

2011
Felicitation by the Lions Club for his outstanding contribution to education.

2022
Honoured by Times of India with GURUDAKSHINA award.

2024
Received honour from Confederation of Indian Industries as an outstanding educator, 'Acharya, Samman'.



Partha Sarathi Basu

Partha Sarathi Basu is the Managing Director of Ashirvad by Aliaxis and a distinguished member of the Global Executive Committee (EXCOM) of Aliaxis, a world leader in fluid management solutions.

With over 3 decades of rich and diverse leadership experience spanning 7 industries, Partha brings a rare blend of strategic vision, operational excellence, people leadership, and transformation expertise. Over the course of his illustrious career, he has held senior leadership positions across globally renowned organizations and leading Indian enterprises including Coca-Cola, KPMG, AkzoNobel, Whirlpool, Tata Group, IFB Group, and SpiceJet. His cross-industry exposure across manufacturing, services, aviation, consulting has enabled him to successfully lead business transformation, culture building, growth acceleration, and organizational excellence. He is widely known as a 'turn around specialist' - be it for Businesses as a whole or for functions.

Partha is a FCWA, also holds a DBF from ICFAI and an Executive Certificate in General Management from the Indian Institute of Management Calcutta (IIM Calcutta). In addition, he is a certified professional coach and an acclaimed author of six books including two best sellers around leadership, future of skills & people management.

Partha believes in continuous learning and is widely respected for his people-centric servant leadership approach and his commitment towards nurturing future leaders and shaping future-ready leadership ecosystems. Partha has been the recipient of several prestigious recognitions and industry accolades for leadership and business excellence.

Beyond business, Partha is deeply passionate about Bollywood and loves to spend time in travel, fitness, writing and spending quality time with friends and family. Partha hence represents the ideal convergence of cross industry excellence, visionary leadership, transformational leadership, governance capability, and commitment to building the next generation leadership through upskilling (outskilling) yet grounded following servant leadership principles.

"Partha believes in continuous learning and is widely respected for his people-centric servant leadership approach."

- Leader, Strategist, Transformer, People Champion.
- Author, Coach, Mentor, Life-long Learner.
- Global Experience, Cross Industry Excellence.
- Building Future-Ready Leaders and Leadership Ecosystems.



Prof. Manoshi Roychowdhury

Prof. Manoshi Roychowdhury is a distinguished leader in the education and enterprise sectors, whose journey is defined by pioneering initiatives, transformative impact, and a legacy of excellence. Her impactful journey is defined by remarkable achievements, innovative initiatives, and prestigious accolades.

As the Co-Chairperson of Techno India Group and Co-Chancellor of Techno India University, her influence is profound. She is the esteemed Founder of Techno India Group Public Schools (TIGPS), a network spanning 18 schools across West Bengal and Madhya Pradesh, dedicated to accessible, quality education.

Her profound commitment to holistic development is evident through her brainchild initiatives:

- Monorship:** The dedicated wellness wing of TIG, established as a staunch advocate for mental well-being.
- Techno Olympica Knights:** An inter-school sports event fostering athleticism and camaraderie.
- Labornya:** A powerful voice for women's empowerment, her signature initiative Labornya honours and uplifts women from all walks of life, echoing her own journey as a beacon of strength and inspiration.
- Human Library:** Another pioneering initiative fostering connection and understanding.
- Sustainable Durga Idol Project:** Now in its fourth year, this project reflects her deep commitment to blending tradition with environmental responsibility and innovation.

Beyond the academic sphere, Prof. Roychowdhury extends her expertise as a Chief Mentor in the Bengal Business Council, the Vice President of the Association of Private Universities, and the Chairperson of the BCCAI Women's Forum, in addition to her association with the Academy of Fine Arts. Her commitment to sustainability is also showcased through her support for "Jhore Jole Jungle," an eco-tourism resort in Bhukhali. Under her dynamic leadership, the Techno India Group Public Schools have received consistent national recognition, including winning the Best Chain of Schools in the Eastern Region at the Education Excellence Meet by Assocam for three consecutive years.

Prof. Roychowdhury is a highly decorated professional, having been the recipient of numerous awards, including the Mother Teresa International Award, Atmanirbhar Bharat Award, Shegriener Award, Tagore Sarwan Award, Siksha Samman Award for Excellence in Institutions & Building Education, and the Shakti Samman for Visionary Leadership. Her commitment was most recently honored with the Sister Novella Samman 2025 in the Education category. Her latest accolade, the Samaj Sera Nari Award, stands as a proud recognition of her unwavering dedication, strength, and impactful contribution to society.

Prof. Manoshi Roychowdhury's journey—rich, inspiring, and continually evolving—stands as a testament to what purposeful leadership can achieve. Her work motivates women across the globe to challenge limitations, embrace their potential, and strive for extraordinary success.

"Her vision, compassion and leadership continue to inspire, empower and transform lives."

Co-Chairperson Techno India Group and Co-Chancellor Techno India University

Founder Techno India Group Public Schools (TIGPS) 18 Schools across West Bengal & Madhya Pradesh

Champion of Education, Women Empowerment, Mental Wellness and Sustainability

Recipient of Numerous National Awards and Honours



Ms. Shaon Sengupta



Shaon Sengupta is the Creative Fellow and Managing Director of Experience Design at Deloitte Digital, part of Deloitte Consulting, where she leads transformative experience and innovation initiatives at the intersection of business, technology, and human-centered design.



With nearly two decades of experience, Shaon has worked closely with C-suite leaders across industries to drive customer experience transformation, service innovation, and strategic design-led growth. Prior to Deloitte, she was the Country Leader for Kyndryl Vital India at Kyndryl, the erstwhile IBM Global Technology Services business, leading initiatives in Service Design, Design Strategy, and Customer Experience.



Earlier, as Studio Director at Philips Design Bangalore and Head of Design for Philips India, she helped scale the India studio into the largest Philips Design studio outside the Netherlands and established pioneering capabilities in Data Design, Service Design, and Design Strategy.



A graduate of National Institute of Design, Shaon has received multiple international recognitions including the IF Design Award, Red Dot Design Award, the Next-Gen Women Leader Award at the Zinnov Awards, and the Srijan Shakti National Award by World University of Design.

“
Designing experiences that create impact, inspire innovation, and shape a better tomorrow.”



Creative Fellow & Managing Director – Experience Design Deloitte Digital



Nearly 2 decades of experience working with C-suite leaders across industries



Expertise in Experience Design, Service Innovation, Design Strategy & Human-Centered Design



Recipient of multiple international awards and recognitions



DOLA BANERJEE



Dola Banerjee began archery at age 9 with the Baranagar Archery Club in 1990 and represented India at 16 in the 1996 Youth World Championship in San Diego. Over a career spanning 20 years, she has been a regular member of the Indian women's archery team, competing in 2 Olympic Games, 3 Asian Games, 4 World Championships, 11 World Cups, and more than 50 international events.



At the 2004 Athens Olympics, she finished 13th individually and 8th with the team, while the Indian team secured 7th place at the 2008 Beijing Olympics. Her landmark achievement came in November 2007, when she won the individual recurve gold at the Archery World Cup Final in Dubai, becoming world champion. Earlier that year, she also won the individual recurve title at the World Cup leg in Dover, England. She further added an individual bronze and team gold at the 2010 Delhi Commonwealth Games, along with a team bronze at the 2010 Guangzhou Asian Games.



Dola is the second Indian woman archer to be conferred the Arjuna Award in 2005. She currently serves as an Executive Council member of the Indian Olympic Association.



Beyond competition, she runs archery training centres in Kolkata, Delhi, Chhattisgarh, and Jharkhand, and conducts a school development program in Kolkata with her brother Rahul Banerjee, also an Arjuna Awardee and coach of the Indian Archery Team.

“
Aim with focus, shoot with heart, achieve with purpose.”



20 years of excellence in international archery



World Champion – Archery World Cup Final 2007, Dubai



Arjuna Awardee – 2005



Represented India in 2 Olympic Games



Mentor, Coach, Nation Builder



MR. RAKESH RANJAN

Additional Secretary
DAMODAR VALLEY CORPORATION



He is from Patna, Bihar. He did schooling and graduation from Patna.



Engineering graduation from NIT, Patna and also having Post Graduate Diploma in Management with specialisation in Operation Management.



He joined DVC in 1997 as Assistant Engineer (Mechanical).



He also worked at Bokaro Power supply Colliery (P) Ltd. (BPSCL), a joint venture of DVC from 2008 to 2013 as Head of Department of Coal Co-ordination and Project Management.



Having a special interest in the field of Environment Management & Materials Management.



He attended a Govt. of India programme in Industrial and Environmental protection in Japan as a GoI nominee.



At present he is Additional Secretary at DVC.

“
Committed to sustainable progress, responsible resource management and nation building.”



From Patna, Bihar



B.Tech. NIT, Patna



PG Diploma in Management (Operation Management)



Government of India Programme in Industrial and Environmental Protection, Japan



MANTU MURMU

I was not a Table Tennis player in my childhood, I did not even know what Table Tennis is. I have never seen these games in my village. After joining the service in 1980, my interest in this game increased.

Gradually, my path became a melody, table tennis is a unique chapter in my life. This path that started with a small dream has reached the international stage today, behind this achievement is a long period of hard practice, hard work, confidence and indomitable willpower.

I have faced obstacles at every step of life, people from other communities say, we express ourselves by wearing different clothes, we are all one, one nation, one soul, but in reality it is not like that, this Mantu Murmu whom you are seeing now, did not become Mantu Murmu in a day, I have started Table Tennis since 1981, at every step I have had to hear that I am a person from another community, from that place I have brought myself to this place today only because of my confidence, patience and willpower.

I will learn this game. I cannot be held back.

Who is Mantu Murmu? My game will make me known, sports are such things that bring everyone together, there is no caste difference, only if there is this spirit of “Sportman” will we be able to see the direction of new light.

I believe that if a person's dream is real and if hard work and dedication are added to it, then no obstacle can stand in the way of success.

“
My game will make me known, sports are such things that bring everyone together, there is no caste difference, only if there is this spirit of “Sportman” will we be able to see the direction of new light.”



Started Table Tennis in 1981



From a small dream to the international stage



Overcame obstacles with confidence, patience and willpower



Believes in hard work, dedication and an indomitable spirit



An inspiration for one nation, one soul



Kallol Ghosh

Senior General Manager- Materials
Tata Medical Center, Kolkata
— Serving since the year 2009 —

“
Excellence in materials management builds stronger foundations for healthier tomorrows.
”

- 3 decades of experience in Materials Management
- Expertise in managing greenfield & brownfield projects
- Special focus on Healthcare & Pharmaceutical industries
- Driven by proficiency, commitment & professional passion



Passionate devotee of “Materials Management” profession with 3 decades of experience having proficiency in managing greenfield & brownfield projects especially on Healthcare & Pharmaceutical industries



The organization I previously served for:

- Woodlands Hospital Limited
- Wockhardt Hospitals Limited
- Apollo Gleneagles Hospital
- Torrent Pharmaceuticals
- ABB ALSTOM Power



Former students of:

- Calcutta University
- Indian Institute of Materials Management
- Punjab Technical University
- Indian Institute of Management – Calcutta
- National Law School of India University
- Post Graduate Institute of Medical Science



Dr. Jayanta Basu

PROFILE



Dr. Jayanta Basu, based in Kolkata, India, is a renowned environment and climate communication specialist, journalist, and academic associated with Calcutta University. He contributes to leading media platforms including *The Telegraph*, *ABP*, *Down to Earth*, and *Huffington Post*, and has covered global climate summits (COPs) since 2009.



He has led several impactful environmental campaigns across eastern India and South Asia, focusing on climate change, Sundarbans, Kolkata's air pollution, wetlands, river encroachment, and related issues.



Dr. Basu is the recipient of prestigious honors such as the *Paryawaran Saranskash Samman 2020*, *Golden Tiger Green Journalist Award*, and was nominated by the *Earth Journalism Network* for the Paris Climate Summit 2015.



He is the Founder Director of the nonprofit *EnGIO*, collaborating with organizations such as the *World Bank*, *UNICEF*, *DFID*, *MIT USA*, *IIT Kharagpur*, and *Climate Action Network South Asia*. Recently, he was nominated by UN agencies as a *Climate Change and Disaster Risk Reduction Specialist*.



He is also an active voice in audio-visual media and environmental documentaries.

“
Committed to communicating for a sustainable future and a resilient planet.
”



Environment & Climate Communication Specialist and Journalist



Academic Associated with Calcutta University



Covered Global Climate Summits (COPs) Since 2009



Founder Director of Nonprofit EnGIO



Active Voice in Audio-Visual Media and Environmental Documentaries



Mr. Abhishek Mishra

MD PNM MINERALS PVT LTD

Director

M/s Pranabnandan Minerals Pvt. Ltd.

With over 35 years of rich experience in the coal industry, **Mr. Pranabnandan Minerals** brings deep domain knowledge, practical expertise and a strong commitment to **ethical, transparent and client-focused business practices**. Under his leadership, the company continues to grow with integrity, innovation and a passion for excellence.



- We are in this trade of dealing in coal from mines for last 35 years.
- We practically do the job by working on ground level.
- More than 250+ staff to handle all the challenges during all cargo handling and transportation
- On the basis of our practical grip over field which is the ultimate reason of performance.
- Currently, we are on Coal Mining, Handling & supplying coal, iron ore, fly ash to our clients from various Railway siding from CCL, MCL, BAILL, JODA, KOLERA & JHARSUGUDA to procure quantity within committed time.
- We have got full infrastructure in the field to meet out the requirement of our clients.
- For a transparent working, we would like to have company's representatives at siding to help and guide us for the best and timely execution of the work.
- We ensure the minimum cost for the transportation and lifting of coal, iron ore, any ash with assured city movement guarantee from all siding.
- We have dedicated team for loading with railways, locals, and others for easy operations and extraction.

If you are kind enough to provide us a chance we can practically deliver our commitments.

ABOUT US



- We are in this trade of dealing in coal from mines for last 35 years.
- M/s Pranabnandan Minerals Pvt. Ltd. is a private limited company incorporated under the Companies Act 2013 (18 of 2013).
- In April 2017 We have formed M/s Pranabnandan Minerals Private Limited as a new company for CCL, BCL, MCL, Jharkhand, Odisha and Uttar Pradesh (UP) Subsidiary to serve best to our clients.
- At Pranabnandan Minerals, the Client satisfaction is our main focus, reached through innovative and cost effective services.
- We believe in transparent and timely trade practices, which in turn helps achieve a win-win scenario for all stakeholders and can help longer profitability and greater transparency to the trade practices.



We are Professionals



We are Creative



We are Talented

AWARDS & RECOGNITION



Pranabnandan Minerals Pvt. Ltd. is awarded from "Deshratna Dr. Rajendra Prasad Award" National Award-2022 for "Atama Nirbhar Bharat Ki Hagedori"

“It shows how we are contributing ourselves to the Nation and our passion for the development of the Nation and all mankind.”



35+ Years of Experience



250+ Dedicated Team



Coal, Iron Ore & Fly Ash Supply Experts



Integrity, Transparency & Commitment



Client Satisfaction is Our Priority

Driven by Experience. Defined by Integrity. Committed to Excellence.



PRADEEP PUROHIT

STAR CEMENT



I was born in Calcutta and completed my schooling and graduation from the University of Calcutta before entering the corporate world.



I began my professional career with a Birla Group organisation in the field of Materials Management. This early exposure proved to be a highly enriching and diversified learning experience, covering materials management, project management, and key commercial functions. The role provided a strong foundation in industrial operations and large-scale project execution.



After seven and a half years, I transitioned to an engineering organisation engaged in the manufacture of processing machinery. Over a period of more than ten years, I headed the Materials Department and managed several complex outsourcing and procurement functions. In addition to materials management, I was entrusted with broader commercial responsibilities, including logistics, taxation, statutory liaison, and vendor development.



I joined Star Cement Limited in 2004, during its formative phase, when the company's first manufacturing plant was under construction. Since then, I have been closely associated with the organisation's growth journey, contributing to the development and scaling up of operations across multiple functions.

PRADEEP PUROHIT

STAR CEMENT



Born in Calcutta and completed schooling and graduation from the University of Calcutta before entering the corporate world.



Professional career began with a Birla Group organisation in the field of Materials Management.



Extensive experience in Materials Management, Project Management and key Commercial Functions.



Over 25 years of rich experience in industrial operations, large-scale projects, procurement, logistics, taxation and vendor development.





IIMM Research Centre
CENTRE FOR RESEARCH IN
MATERIALS MANAGEMENT (CRIMM)



Minutes of meeting of CRIMM at SAP conference room of TIU, WB on 27th March, 2026

Agenda of BOG Meeting of CRIMM at SAP Conference Room on 27 th March 2026 at 3.30 pm

1. Introduction of BOG members of CRIMM
2. Proposed activities of CRIMM during the next financial year to be discussed and adopted
3. Introduction of Certificate program, if any, proposed for the next financial year to be discussed and adopted.
4. Introduction of Project Management programs in collaboration with Project Management Institute USA, if any, proposed for the next financial year to be discussed and adopted.
5. Scope of fundamental research in Supply Chain Management
6. e-Journal of CRIMM
7. Discussions on Financial Performance of CRIMM
8. Support from IIMM
9. Opening of overseas Research Centres
10. Execution of renewal of CRIMM Agreement
11. Press release
12. Any other point of relevance
13. Close of Meeting

Introduction of BOG members of CRIMM

BOG Member nominated by IIMM

- 1) Mr. Malay Chandan Mazumdar Jt, Chairman
- 2) Dr. Nripendra Kumar Member
- 3) Dr. Y Venkata Ramana Member
- 4) Dr. Dibakar Swain Member
- 5) Gajanan Palankar, Fellow - CRIMM Member
- 6) P Sengottaiyan, Fellow - CRIMM Member
- 7) Dr. Samar Roy Chowdhury Member
- 8) Mr. Animesh Chattopadhyay Member

BOG Member nominated by TIU,WB

- 1) Prof. (Dr) Goutam Sengupta, Rector TIU, WB - Joint Chairman
- 2) Prof. (Dr) Debashis Chaudhuri, Dean (Engineering, Projects, Students Affairs), TIU, WB- Member
- 3) Prof. (Dr) S N Roy, Adjunct faculty, TIU,WB- Member
- 4) Prof. (Dr) Tripti Chakrabarti, Dean Basic Sciences, TIU,WB- Member
- 5) Prof. Asoke Kumar Paul, Associate Professor, TIU,WB- Member

- 6) Prof. (Dr.) Debabrata Bhattacharjee, Professor, TIU,WB- Member
- 7) Mr. Soumitra Bhowmick, Vice President and CFO, Techno India Group-Member
- 8) Dr. Paramita Sen, Assistant Professor, Rector's Office, TIU,WB- Member

Advisor

- 1) Mr. Asok Dasgupta, Advisor
- 2) Dr. PK Dey, Professor, Aston Business School, UK
- 3) Prof. (Dr) Gautam Majumdar, Pro Vice Chancellor, TIU,WB

Board of Research Studies

- 1) Prof (Dr) Goutam Sengupta,(Chairman)
- 2) Prof.(Dr.)S N Roy
- 3) Prof (Dr) Debashis Chaudhuri
- 4) Dr. D. Rajasekar
- 5) Dr. A.V. Shama Sundar

Proposed activities of CRIMM discussed and adopted

- 1.0 Target of CRIMM fellowship :
Target for the Calendar year 2026:
10 – 15 Fellowship
- 2.0 National and Global Summits: 4 per year
- 3.0 Consultancy
Kept in abeyance. Prof SN Roy will prepare an approach paper BY MID MAY, 2026

Introduction of Certificate/Diploma program -proposed and adopted.

- 1.0 Certificate program on Supply Chain Management may be launched by TIU in collaboration with CRIMM (It will be discussed and National President of IIMM to revert back.
- 2.0 Certificate program on Purchasing Management may be launched by TIU in collaboration with CRIMM (It will be discussed and National President of IIMM to revert back.).
- 3.0 Certificate/Diploma program on Logistics Management
- 3.1 Diploma program may be launched by TIU in collaboration with CRIMM (It will be discussed and National President of IIMM to revert back.
- 3.2 Kolkata Branch of IIMM should give a preference TIU/CRIMM while approaching other Universities on matters of launching joint certificate courses. TIU will send a request letter to Chairman Kolkata Branch to this effect.

For more information please contact

MALAY C MAZUMDAR, Jt. Chairman – CRIMM

M: 9909910964 / 9726425331 Email: malay_mazumdar@yahoo.co.in, crimm.malayimm@gmail.com

All India Council for Technical Education

(A Statutory body under Ministry of Education, Govt. of India)

Nelson Mandela Marg, Vasant Kunj, New Delhi-110070 Website: www.aicte-india.org



APPROVAL PROCESS 2026-27

Extension of Approval (EoA)

F.No. Western/1-46216228266/2026/EOA

Date of Approval: 02-Apr-2026

To,

The Secretary,
Tech. & Higher Education Deptt.
Govt. of Maharashtra, Mantralaya,
Annexe Building, Mumbai-400032



Sub: Extension of Approval for the Academic Year 2026-27

Ref: Online application of the Institution submitted for Extension of Approval for the Academic Year 2026-27

Sir/Madam,

In terms of the provisions under the All India Council for Technical Education (Grant of Approvals for Technical Education), Powers delegated in AICTE ACT 1987, (No 52 of 1987) chapter II - u/s 2(g) to regulate Technical and subsequent Regulations of AICTE, I am directed to convey the approval to:

Permanent Id	1-7369703621	Application Id	1-46216228266
Name of the Institution	INDIAN INSTITUTE OF MATERIALS MANAGEMENT	Name of the Society/Trust	INDIAN INSTITUTE OF MATERIALS MANAGEMENT
Institution Address	PLOT NO. 102 & 104, SECTOR 15 INSTITUTIONAL AREA, SBD BELAPUR, NAVI MUMBAI, NEW PANVEL, NAVI MUMBAI, MUMBAI SUBURBAN, Maharashtra, 400614	Society/Trust Address	PLOT NO. 102 & 104, SECTOR 15 INSTITUTIONAL AREA, SBD BELAPUR, NAVI MUMBAI, NAVI MUMBAI, MUMBAI SUBURBAN, Maharashtra, 400614
Institution Type	Private-Self Financing	Region	Western
Year of Establishment	1975		

Approved ODL Courses for 2026-27:

Sr.No.	Level	Program	Name of the Course	Year Started	Intake Approved 2026-27
1.	POST GRADUATE DIPLOMA	Management	PGDM (MATERIAL MANAGEMENT)	2018	400
2.	POST GRADUATE DIPLOMA	Management	PGDM(LOGISTICS AND SUPPLY CHAIN MANAGEMENT)	2018	400

All AICTE approved Institutions are empowered to nurture ecosystems for Skilling (through Vocational courses) via making effective use of existing infrastructure facilities and human resources.

It is mandatory to comply with all the essential requirements as given in APH 2024-27 (Chapter-VI)

Application No:1-46216228266

ALL INDIA COUNCIL FOR TECHNICAL EDUCATION

Page 1 of 4

Note: This is a Computer generated Report. No signature is required.

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IIMM BRANCHES ACTIVITIES



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भारतीय सामग्री प्रबंधन संस्थान Indian Institute of Materials Management

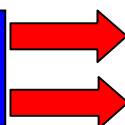
NHQ - Plot No. 102-104, Sec.-15, Institutional Area, CBD Belapur, Navi Mumbai - 400614

Next Admission JULY 2026 SESSION

Explore a career in Management of Purchasing, Supply Chain,
Logistics & Materials Management

AICTE APPROVAL – F.NO. Western/ 1-46216228266/2026/EOA

**Post Graduate
Diploma**



Materials Management

Logistics & SCM

THROUGH DISTANCE (CORRESPONDENCE) MODE

FRESH GRADUATES CAN ALSO APPLY

S. No.	Programmes	Approved	Eligibility	Duration
1.	Post Graduate Diploma in Materials Management (PGDMM)	AICTE	Graduate in any discipline from any Recognized University	2 Years
2.	Post Graduate Diploma in Logistics & SCM (PGDL&SCM)	AICTE	Graduate in any discipline from any Recognized University	2 Years

PROSPECTUS CAN BE OBTAINED FROM FOLLOWING IIMM BRANCHES
Prospectus Cost Rs.1000/- & By Post Rs.1100/-

REGIONS	CITIES
NORTHERN REGION	ALWAR - 9731245655/ 787775655 AJMER-9928019295 AYODHYA – 9415402109 BHIWADI – 9828588567 CHANDIGARH 9815314430 / 0172-2556646 DEHRADUN 7906443191 DELHI 011 -41354969/9810830427/9818664267 GREATER NOIDA 9818464359 JAIPUR 9799299157 KANPUR 7897000150 / 9935032495 LUCKNOW 9415752999 LUDHIANA 0161-5212268/9815549987 RAE BARELI 9451077744 UDAIPUR 7568419514, 9772704888
EASTERN REGION	BOKARO 8986873175 / 8986873151 BURNPUR 9434777116 DHANBAD 9470595541 DURGAPUR 0343-2574303 JAMSHEDPUR 9308321421 KOLKATA 6291335421 / 9836123999 / 9123705058 NALCO NAGAR 9437081126 RANCHI 7362864717/ 8987788599 ROURKELA 8260711943
WESTERN REGION	AHMEDABAD 7383012684 / 9909996711 BHARUCH 9998975891 CHHATRAPATI SAMBHAJINAGAR 9423455983 GOA 9423007106 GANDHIDHAM 7046737857/9925066322 JAMNAGAR 0288-2750171 MUMBAI 7738543596/9820393639 MUNDRA 9687660068 NASHIK 9850730029 / 9356466083/0253-4044406 PUNE 7276010854 SURAT 0261-2802682 VADODARA 7043959060 / 7802053410 VAPI 8758294011 VITTHAL V NAGAR 9825028050
SOUTHERN REGION	BANGALORE 080-25327252/9148745062/9972441466 CHENNAI 044-23742750/ 9444656264 COCHIN 04842203487 / 9400261874 HOSUR 9448018407 HUBLI 0836-2264699/ 9482779440 HYDERABAD 9949872010 / 9398910901 KGF 9880994684 MANGALORE 0824-2882203 MYSORE 9620001502 TRIVANDRUM 8086011015 VISAKHAPATNAM 9701347694
CENTRAL REGION	BHOPAL 8085856437 BHILAI 9407984081 BILASPUR 9425531806 INDORE 9826625417 NAGPUR 0712-2229446/9423074072

A form can be downloaded from www.iimm.org.in/register and can be submitted to nearest IIMM Branch

For more information, please visit : www.iimm.org

NHQ-Mumbai 022-45001022
iimmedu@iimm.co.in

NHQ-Delhi Office : +91 99908 99961
education.nhqdelhi@iimm.org