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MATERIALS MANAGEMENT REVIEW

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SPECTRUM 2026

ANNUAL SIGNATURE EVENT OF CHENNAI BRANCH

Theme: "Reimagining Supply Chains with AI"

SPECTRUM 2026: LIGHTING OF THE LAMP BY DIGNITARIES ON FEBRUARY 27, 2026 AT MMA AUDITORIUM, CHENNAI

SPECTRUM 2026

ORGANIZED BY IIMM CHENNAI BRANCH

From the Desk of National President & Editor in Chief

Greetings from your National President!!!

Dear All Members of IIMM,

When Finance Minister Nirmala Sitharaman presented the Union Budget 2026–27 on 1 February 2026, it was described as a "growth-oriented, investment-led" fiscal roadmap. Beyond the figures, its real significance lies in strategically reconfiguring India's supply chain ecosystem – from logistics infrastructure and domestic production to global value chain integration and export competitiveness. This budget positions India as a resilient, diversified, and future-ready supply chain hub.

Perhaps the most consequential aspect for supply chain management is the continuation and expansion of capital expenditure on infrastructure. The budget allocates a sharply increased 12.2 lakh crore for capital outlays in FY 2026–27, underscoring transport corridors, rail freight, ports, and waterways as national priorities.

This is more than a routine figure – it reflects a strategic shift from ad hoc logistics spending to systematic network building. Improved connectivity and reduced transit times are not just about moving goods faster; they enable just-in-time manufacturing, expand market reach for MSMEs, and reduce the crippling logistics cost drag that has historically remained well above global norms.

The 2026–27 Budget moves beyond traditional tax and expenditure rhetoric by aiming to build supply chain depth, not just capacity. A notable example is the significant increase in funding for the Electronics Components Manufacturing Scheme (ECMS), which has been raised to 40,000 crore. This demonstrates a deliberate effort to shift the electronics supply chain from assembly-led operations towards higher value-added component production. The emphasis is on localizing sub-assemblies and advanced inputs – the elements that determine where real value lies in global electronics networks. Such policies are long overdue, given India's reliance on imported parts, which leaves local producers vulnerable to external shocks.

Similarly, energy transition sectors – notably rare earths, critical minerals, and EV value chains – have received targeted support through incentives and corridor development. This not only addresses immediate industrial needs but also anticipates global demand shifts towards clean technology and mobility.

A critical yet underexplored aspect of Budget 2026–27 is its alignment with the China-plus-one manufacturing strategy adopted by multinational firms. By reducing duties on key inputs and expanding incentives for exporters, India is positioning itself as a competitive alternative in global sourcing.

Connecting local suppliers with global buyers, particularly in sectors such as electronics, automotive components, textiles, and chemicals, will require more than tariff adjustments; it also demands institutional support for quality compliance, digitized customs processes, and reliable logistics. The budget moves in this direction, but real progress will depend on private investment confidence and timely reforms in trade facilitation.

The Union Budget 2026–27 marks a pivotal moment in India's approach to supply chain policy, shifting from fragmented sectoral measures to a cohesive growth strategy that integrates logistics, manufacturing, taxation, and export orientation. The fiscal blueprint emphasizes long-term competitiveness, self-reliance, and global integration. The real question now is not what the budget promises, but how effectively those promises are translated into operational realities. If execution matches ambition, India could be on the verge of a generational leap in supply chain resilience and economic competitiveness.

Thanking you and wishing all the best.

P.M. BIDDAPPA
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"FROM VISION TO VICTORY" THE TRANSFORMATIVE POWER OF THE FOUR PILLARS OF PROJECT MANAGEMENT EXCELLENCE

Purpose • People • Process • Performance

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Abstract : "Success in project management is not measured by the plans we create, but by the purpose we serve, the people we empower, the processes we perfect, and the performance we deliver."

In today's fast-moving project environment, excellence is not created by isolated actions — it is forged through the disciplined integration of four fundamental pillars: **Purpose** (The Why), **People** (The Who), **Process** (The How), and **Performance** (The Outcome). True project leadership is not about managing tasks; it is about aligning why we act, who delivers, how work flows, and what value is ultimately achieved.

This work demonstrates a decisive truth: sustainable project success is not accidental — it is **architected.** When these four pillars operate in harmony, projects evolve from tactical activities into powerful engines of strategy, value creation, and organizational transformation. This framework equips leaders and organizations to move beyond execution and into **excellence by design — where clarity drives commitment, structure enables speed, and performance delivers lasting impact.**

I. INTRODUCTION: The Foundation of Excellence

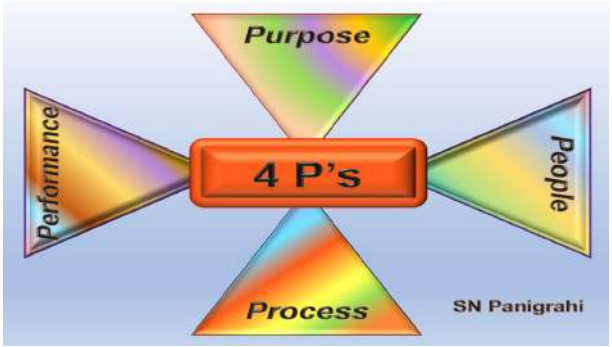
The Evolution of Project Management Thinking

Project excellence is no longer built on cost & schedules alone — it is built on alignment.

Project management has evolved from a mechanistic discipline focused on tasks and timelines into a strategic, human-centered leadership system. Modern projects are not merely technical exercises; they are complex change engines that demand clarity of purpose, engagement of people, disciplined processes, and measurable results. Success today depends not just on what is delivered, but on **why it matters, who is involved, how work flows, and what value is ultimately created.**

The **Four Pillars framework — Purpose, People, Process, and Performance —** emerges from this evolution as a holistic model for sustainable excellence.

Purpose (WHY) – Strategic Intent & Value
People (WHO) – Leadership & Human Capital
Process (HOW) – Execution & Governance Systems
Performance (WHAT) – Results, Benefits & Outcomes



Each pillar represents a critical dimension of success, and together they form an integrated system where alignment multiplies impact. Strength in one pillar amplifies the others; weakness in any one can undermine the whole. This is not a checklist — it is a leadership architecture.

In today's **VUCA** (Volatility, Uncertainty, Complexity, Ambiguity) & **BINA** (Brittle, Anxious, Nonlinear, and Incomprehensible) environment, where change is rapid, disruptions are unpredictable, cause-and-effect relationships are difficult to interpret, decision cycles are compressed, and competitive pressures are intensifying, and stakeholder expectations continue to rise, the Four Pillars provide both stability and adaptability**.** They act as strategic anchors that keep projects focused on value while enabling teams to respond to constant change. Evidence from global project research consistently confirms that failures stem not from tools, but from breakdowns in purpose

clarity, people engagement, process discipline, and performance measurement. The Four Pillars directly target these root causes.

What truly differentiates this framework is **synergy.** Purpose energizes people. People strengthen processes. Processes drive performance. Performance reinforces purpose. This creates a self-reinforcing cycle of excellence — where projects become engines of strategy, learning, and competitive advantage. In this model, project management is no longer about control. It becomes a system for **mobilizing vision, enabling execution, and delivering measurable business value.**

"Excellence is never an accident. It is always the result of high intention, sincere effort, intelligent direction, and skillful execution. It represents the wise choice of many alternatives—choice, not chance, determines destiny." — Aristotle

II. THE FIRST PILLAR: PURPOSE (The Why)

"A project without purpose is merely an endeavor — lacking strategic intent."

Purpose is the strategic foundation of every successful project and the anchor of a **shared vision.** It is what transforms work from an isolated activity into a collective enterprise impact.

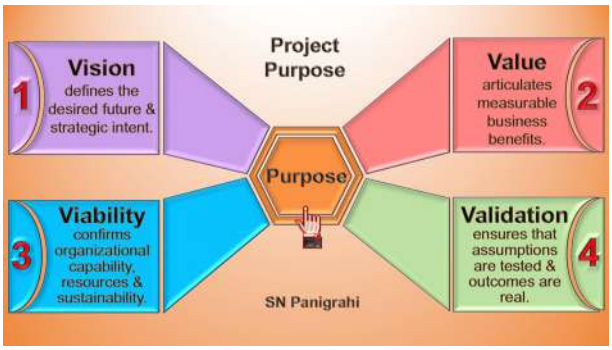
Purpose Answers the 4 Transformational Leadership Questions:

- Ø **What problem are we solving?** (Relevance & necessity)
- Ø **Who truly benefits?** (Stakeholder & value creation)
- Ø **How will success change the future?** (Vision, impact & transformation)
- Ø **Why must this be done now?** (Urgency, priority & strategic timing)
- Ø **How will we measure and validate success?** Links purpose to outcomes, ROI, and accountability

Purpose fuels performance. When the purpose is clear and shared, teams move beyond deliverables and align around outcomes that matter to the organization, customers, and society. Purpose defines, Strategic alignment, Business case justification, Value proposition, Organizational intent, Shared Vision & Drives Business Value

High-performance organizations **start with Why,** and **let strategy drive the business value.** Purpose creates meaning, ownership, and commitment that no process alone can deliver. It connects daily execution to strategic priorities and turns compliance into genuine engagement. Purpose-driven teams make smarter decisions, focus on what truly adds value, and convert project success into sustainable competitive advantage.

A robust project purpose is built on **Vision, Value, Viability, and Validation.** Vision defines the desired future and strategic intent. Value articulates measurable business benefits. Viability confirms organizational capability, resources, and sustainability. Validation ensures that assumptions are tested and outcomes are real. Together, these four pillars convert ideas into credible, investment-worthy initiatives with strong business justification and leadership confidence.



The Compelling purpose has clear characteristics. It is **Clear** — simple, unambiguous, and human. It is **Connected** — tightly linked to strategy and stakeholder needs. It is **Challenging** — ambitious and meaningful. It is **Constant** — stable even when tactics evolve. And it is **Compelling** — inspiring excellence, not just compliance. When embedded into governance and decision-making, purpose becomes a leadership discipline that aligns priorities, strengthens resilience, and turns projects into strategic assets that deliver lasting enterprise value.

III. THE SECOND PILLAR: PEOPLE (The Who)

The Human Foundation of Project Success

People Power Performance. Teams Turn Vision into Victory.

Projects succeed or fail not because of plans or tools, but because of the people who design, lead, and execute them. The Second Pillar focuses on Leadership

Effectiveness, Team Competence, Stakeholder Engagement, Culture & Motivation, and Communication Effectiveness — the human drivers that transform strategy into results.

Project excellence is driven by the six critical people enablers:

- Competence **! Right skills & knowledge**
- Capability **! Proven ability to deliver**
- Communication **! Clear alignment & escalation**
- Commitment **! Ownership & accountability**
- Collaboration **! Cross-functional execution**
- Culture & Motivation **! Ownership, trust, and high-performance mindset**

Together, these ensure that teams don't just execute plans — they deliver outcomes, sustain performance, and build organizational capability. No methodology can compensate for the wrong team, weak leadership, or disengaged stakeholders. The People pillar recognizes a simple truth: projects are human enterprises.

Performance is created through trust, teamwork, and talent — not templates.

Diverse thinking strengthens decisions, creativity, and problem-solving. Research consistently shows that diverse, inclusive teams outperform homogeneous ones because they challenge assumptions and generate better solutions. Great teams are not accidental — they are strategically assembled and purposefully led.

The engine of exceptional teams is psychological safety. When people feel safe to speak up, challenge ideas, admit mistakes, and share insights, performance accelerates. Trust unlocks innovation. Respect enables constructive conflict. Clear roles, shared goals, open communication, and mutual accountability create an environment where every voice adds value. In such cultures, teams don't just execute — they learn, adapt, **and** outperform**.**

Leadership is the multiplier. Great project leaders don't control — they enable. They remove barriers, amplify talent, build confidence, and develop people while delivering results. They engage stakeholders as partners, not obstacles, turning resistance into ownership and alignment into advocacy. The strongest leaders use projects not only to deliver outcomes, but to grow people, strengthen culture, and build future capability. Because in the end, tools may support projects — but people determine success.

"Talent wins games, but teamwork and intelligence win championships**." — Michael Jordan**

IV. THE THIRD PILLAR: PROCESS (The How)

Process as Enabling Structure

"Even the best people fail in broken processes."

Process Creates Flow. Flow Delivers Excellence.

Process is the structural backbone that turns purpose and people into consistent performance. It defines how work gets done through Methodologies **(Predictive, Agile, Hybrid),** Governance Models**,** Standards, Change Control, Risk Management**, and** Quality Systems**. Far from restricting teams, strong processes create freedom — freedom from confusion, rework, and firefighting — enabling teams to focus on value, speed, and results.**

Process transforms effort into consistent results. It provides structure, clarity, and control — enabling teams to work efficiently, manage complexity, and deliver with quality and predictability. The Process (The How – Execution Excellence) **enablers are:**

- How will work flow end-to-end? **(Governance, workflow design & handoffs)**
- How will scope, change, and risk be controlled? **(Discipline, predictability & decision authority)**
- How will quality be built in — not inspected later? **(Standards, assurance & defect prevention)**
- How will information move and decisions be made? **(Reporting, escalation & decision velocity)**
- How will processes adapt to complexity and change? **(Agility, flexibility & continuous improvement)**

High performance is not about more process, but the right process. Smart organizations select methodologies based on context, complexity, and risk — not habit or dogma. Predictive, Agile, and Hybrid approaches each have their place. The goal is not rigid compliance, but methodology fit that balances discipline with adaptability and aligns execution to real-world needs.

Planning and communication convert vision into coordinated action. Clear plans create alignment. Strong communication creates momentum. Together, they ensure that the right information reaches the right people at the right time. When planning is collaborative and communication is intentional, teams move faster, make better decisions, and prevent issues before they become crises.

Risk and quality complete the performance system. Proactive risk management replaces firefighting with foresight. Built-in quality replaces costly rework with right-first-time delivery. Together, they turn uncertainty into managed exposure and expectations into dependable outcomes. Because excellence is not accidental — it is designed, embedded, and repeated.

"Excellence is not an act. It is a habit." — Aristotle

V. THE FOURTH PILLAR: PERFORMANCE (The Outcome)

Beyond Delivery: Measuring True Success

Performance is where purpose, people, and process become real results. It goes beyond on-time and on-budget delivery to focus on outcomes, value, and strategic impact. True success is not just what is delivered — it is what changes, improves, and endures. As the saying goes, "What gets measured, gets managed — and what gets managed, gets improved**."**

High-performance organizations use a balanced view of success. They track delivery, quality, benefits, stakeholder satisfaction, and strategic alignment — not just scope, schedule, and cost. Smart leaders manage trade-offs consciously, making transparent choices that align execution with purpose and enterprise priorities.

Great performance management balances leading and lagging indicators. Lagging metrics show what has happened. Leading indicators signal what is likely to happen. This combination enables early course correction, proactive decision-making, and prevention of surprises. Metrics are not for reporting alone — they are tools for foresight, focus, and fast action.

Performance converts activity into business value. It ensures that projects are not judged only by delivery, but by the outcomes, benefits, and strategic impact they create. The Performance Enablers (The Outcome – Value Realization)

- Ø How will we define success beyond delivery? **(Outcomes, benefits & strategic value)**
- Ø How will we measure what truly matters? **(KPIs, leading & lagging indicators)**
- Ø How will we track value realization and ROI? **(Financial impact & business justification)**
- Ø How will we ensure stakeholder satisfaction? **(Perception, adoption & business acceptance)**
- Ø How will we capture learning and drive improvement? **(Lessons learned & performance maturity)**

Performance is completed through benefits realization, learning, and recognition. Projects exist to create outcomes, not just outputs. Continuous improvement turns every project into a capability builder. Celebration reinforces excellence and fuels future performance. When value is measured, learning is embedded, and success is recognized, performance becomes not an event — but a repeatable organizational strength.

"What gets measured gets managed, but what gets measured and celebrated gets replicated." — Peter Drucker (adapted)

VI. THE INTEGRATION FRAMEWORK: Where Excellence Emerges

The Synergy of the Four Pillars

When Purpose, People, Process, and Performance Align — Powered by Technology — Excellence Becomes Inevitable.

The Four Pillars achieve their true power through integration, not isolation. Purpose sets strategic direction and ensures every initiative is justified by value. People bring the capability, commitment, and resilience to execute under pressure. Process provides the discipline, structure, and flow that converts intent into consistent delivery. Performance validates outcomes, proves value, and drives continuous improvement. When aligned, they do not simply add — they multiply, creating a virtuous cycle that turns effort into impact and projects into strategic advantage. Weakness in any single pillar does not merely limit — it fractures the entire system.

Technology serves as the connective tissue that amplifies all four pillars simultaneously. For Purpose, digital strategy tools, AI-driven portfolio management, and real-time dashboards ensure decisions remain anchored to organizational goals. For People, collaboration platforms, learning ecosystems, and intelligent workforce analytics build capability, connection, and engagement at scale. For Process, automation, workflow orchestration, and agile toolchains eliminate friction, accelerate delivery, and enforce discipline without bureaucracy. For Performance, predictive analytics, live KPI monitoring, and data visualization transform measurement from a retrospective exercise into a forward-looking engine of insight and course correction.

In practice, the framework guides leaders with systematic precision across the entire delivery lifecycle. At initiation, leaders clarify purpose, assemble the right team, select fit-for-purpose processes, define measurable success criteria, and deploy enabling technologies deliberately.

In planning, they translate intent into actionable roadmaps by decomposing scope into prioritized deliverables, aligning resources with competencies, establishing governance and communication cadences, sequencing risks and dependencies, defining performance baselines, and integrating technology tools that enable transparency, collaboration, and data-driven decision-making.

During execution, they continuously reinforce purpose, develop people, adapt processes, monitor performance in real time, and leverage technology to surface risks before they become failures. This balanced, integrated focus prevents over-reliance on any single dimension — ensuring delivery remains aligned, energized, and relentlessly value-driven.

When challenges arise, the Four Pillars provide a powerful diagnostic lens. Every delivery failure can be traced to a gap in purpose, people, process, or performance — or to misalignment between them. This enables leaders to address root causes, not symptoms. Most failures are not technical — they are integration failures. The framework ensures that interventions are targeted, systemic, and sustainable — and that technology is deployed to solve real problems, not create the illusion of progress.

Organizations that achieve sustained, repeatable excellence embed the Four Pillars into their culture and technology architecture simultaneously. Purpose becomes the lens through which initiatives are justified. People development becomes the engine through which capability compounds. Process discipline becomes the operating rhythm through which work flows. Performance measurement becomes the proof through which value is demonstrated and continuously raised. Technology becomes not an afterthought — but the accelerant that makes all four pillars scalable, intelligent, and future-ready.

Over time, excellence stops being an event. It becomes the natural outcome of how the organization thinks, leads, and executes — every day, at every level, across every initiative.

"Excellence is not an act, but a habit." — Will Durant

VII. CONCLUSION: The Path Forward

The Imperative for Integration

When purpose is clear, people are inspired. When people are aligned, processes perform. When processes are disciplined, performance becomes predictable. Together, the Four P's — **Purpose, People, Process, and Performance** — transform projects from operational activities into **strategic engines of business value.**

This journey confirms a central truth: project excellence is not achieved through isolated strengths, tools, or techniques. It is achieved through **integrated mastery.** No single pillar can compensate for weakness in another. Sustainable success demands balance — where clarity of purpose energizes people, capable people execute disciplined processes, and strong performance reinforces learning, confidence, and continuous improvement.

The real power of the Four Pillars lies in action. Leaders and organizations that consciously apply this framework move beyond firefighting and fragmentation. They build cultures of ownership, alignment, and execution excellence. Over time, projects stop being sources of risk and frustration — and become platforms for innovation, growth, and competitive advantage.

Ultimately, the Four Pillars are more than a project management model. They are a leadership philosophy for turning vision into results, effort into impact, and ambition into achievement. When all four are aligned, **excellence is no longer accidental — it becomes inevitable.**

Technology integration acts as the force multiplier across all four pillars — connecting purpose with data, empowering people with intelligent tools, strengthening processes through automation, and enabling real-time performance visibility to accelerate smarter decisions and sustainable value creation.

From Vision to Victory:

Your journey to project management excellence begins with a single step—

the commitment to master Purpose, empower People, perfect Process, and deliver Performance.

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CIRCULAR ECONOMY AND SUSTAINABLE FOOD & BEVERAGES SUPPLY CHAINS

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Abstract : The main focus of this study would be the circular economy methodologies and their sustainability impact. Circular economy operates on closed loop. In this study the food supply chains and beverage supply chains and their sustainability are studied. The various dimensions of sustainability like environmental, economic and societal are studies besides the process and procedure sustainability dimensions also. The study is focused on the impact of circular economy and supply chain sustainability in selected sectors. The application of circular economy principles implemented between food & beverage supply chains and also within food & beverage supply chains. The product life cycle (PLC) assessment is also being studied. The relevance of technology enabled supply chain management is also examined.

Keywords: Circular economy, sustainable food & beverages supply chains, Sustainable development goals

Introduction : A circular economy operates on closed loop not like linear economy. It operates on source, make, deliver and return approach. The circular economy refers to reduce, reuse, recycle and return principles thereby the wastes can be reduced, reduction in pollution and protection of planet a safe place to live. By doing so, we can ensure that these resources are available for future generations. To achieve this, businesses and individuals need to adopt innovative practices such as recycling, reusing, and repurposing materials.

A sustainable supply chain involves three important dimensions such the planet, people and profit. It involves minimizing environmental harm through waste and emissions reduction, ensuring social responsibility via fair labour and community support, and maintaining financial viability. The goal is to create a long-term, resilient, and ethical business model that benefits both the company and society.

According to the Carbon Disclosure Project's (CDP) estimate, firms supply chains account for over 90% of their overall greenhouse gas emissions, which is 11.4 times their direct emissions (IBM, 2025). The significance of green sourcing and procurement, green manufacturing, green warehousing, green packaging, and green logistics has been apparent to MNCs in recent years. The goal is to establish sustainable practices that are seamlessly implemented by all corporate entities across the supply chain. Understanding the product mix is the first step towards sustainability in the food and beverage sector. Optimizing operations begins with an understanding of energy consumption and carbon impact. Reduce expenses, cut carbon emissions, and have a long-lasting effect on the environment. By 2030, the food supply system must reduce the amount of food waste per person worldwide. Adopting circular economy techniques is the answer. Food supply chain companies are now very concerned about food waste and consumption. In the context of economics, excess output and consumption are regarded as negative externalities. As a result, the circular economy (CE) idea has gained popularity as a method for increasing sustainability and decreasing food waste.

Circular Economy : The circular economy is a system where materials never become waste and nature is regenerated. In a circular economy, products and materials are kept in circulation through processes like maintenance, reuse, refurbishment, remanufacture, recycling, and composting. Circular economy, also known as circularity or closed-loop production A circular economy accounts for and values the social and environmental costs of economic activity as well as the financial ones. Circular economy is an alternative to the current linear economy based on a 'take, make, consume and dispose' mindset. It instead seeks to eliminate waste and reduce pollution levels as low as feasibly possible by keeping raw materials and products in use for as long as possible. This lowers the demand for resources, reduces environmental pressure, and helps create a more sustainable society. Figure 1 depicts the concept of circular economy.

Figure 1: Circular Economy (Julian Russel, 2022)

There are three key principles associated with the transition to a circular economy action plan, according to the Ellen MacArthur Foundation: They are: i. Eliminate waste and pollution, ii. Keep raw materials and products in use and iii/. Regenerate natural systems.

Key steps small businesses can take to migrate towards

circular economy are: i. Eco-friendly design, waste management, sustainability schemes and renewable energy source. The small businesses should aim for ISO 9000 Quality Management Systems (QMS), ISO 14000 Environmental Management Systems (EMS) and ISO 50000 Energy Management System (EMS).

In a circular economy, organizations increase product durability, recycle materials and products, use sustainable energy and reuse and repurpose resources. It applies not only to the production and consumption of goods and services but also to how they are used by customers, such as repairing something if it breaks rather than throwing it away, repurposing products into new uses, and buying secondhand products.

The Netherlands is a global frontrunner in the race to circularity with a Circularity Metric of 24.5%. However, the government has ambitious goals: an economy that is 50% circular by 2030 and 100% circular by 2050.

India's circular economy initiative is a major national push to shift from linear "take-make-dispose" models to resource efficiency, aiming to unlock over $2 trillion in value and create millions of jobs by 2050 through strategies like enhanced recycling, Extended Producer Responsibility (EPR), promoting repair, and leveraging digital tech for waste-to-wealth creation, supported by government bodies like NITI Aayog and missions like Swachh Bharat Mission, tackling waste challenges while fostering innovation.

Based on waste generation and resource consumption patterns, the industries with the highest circular economy potential in India are: Steel and metals - utilizing slag and metal scraps. Cement - incorporating fly ash and industrial waste. Textiles - fabric recycling and water reuse systems

Sustainable Supply Chains : A sustainable supply chain is one that fully integrates ethical and environmentally responsible practices into a competitive and successful model. End-to-end supply chain transparency is critical; sustainability initiatives must extend from raw materials sourcing, to last-mile logistics, and even to product returns and recycling processes (SAP, 2026). Three components of sustainable supply chains are : green supply chains, transparent supply and circular supply chains. Twenty years ago, the word sustainability was almost completely synonymous with eco-friendliness. Today, it is a much more holistic term. Green, transparent, and circular supply chains are all components of a modern sustainable supply chain. Sustainable supply chains can be created by adopting industry 4.0 technologies, focusing on SDGs and ESG.

Minth Group Ltd is one of the world's top 100 automotive parts manufacturers. SAP is used to support their digital transformation.

Food Supply Chains : The food chain refers to the food system and pathways through which food items are produced, processed, preserved, marketed, and utilized. There is production of agricultural raw materials, processing and packaging of the raw materials, transportation of the final product, and retail selling and consumption by the end user. This chain helps in getting food products from the farm to the table with the help of food processors while at the same time observing quality and safety measures. With its presence in over 100 countries across the globe, McDonald's is undoubtedly the biggest fast-food chain in the world.

Presently, most Food Supply Chain (FSC) and Beverage Supply Chain (BSC) companies follow linear economy i.e take, use, manufacture, dispose and pollute. This has to be changed to Circular Economy (CE) like produce, consume, reuse, recycle, recovery and disposal. Several major food and beverage (F&B) companies have integrated circular economy principles and sustainable practices into their supply chains, focusing on waste reduction, sustainable sourcing, and packaging solutions. Key examples include Unilever, Nestlé, Coca-Cola, Danone, and PepsiCo. Figure 2 depicts the food supply chain.

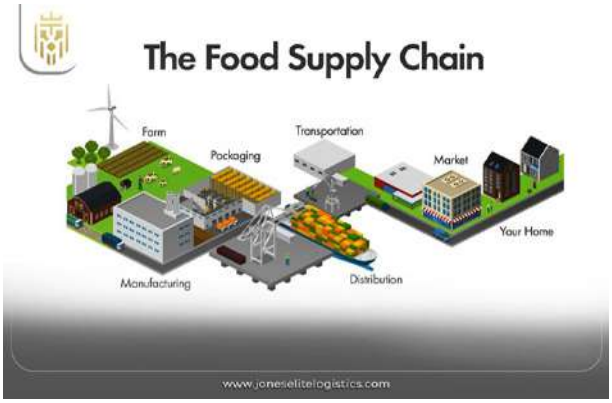

Figure 2: Food Supply Chain (Jones Logistics, 2025)

Beverages Supply Chains : Beverage supply chains are complex, global networks involving the sourcing of raw materials, manufacturing, packaging, and distribution of products to consumers. These chains are high-risk due to reliance on agricultural ingredients and seasonality, requiring robust, visible, and agile management to ensure safety, quality, and timely delivery from farm to consumer. From soft drinks to alcoholic beverages, the challenges supply chains faces in the beverage industry are multifaceted and constantly evolving. In this blog, we delve into some of the prominent challenges that beverage companies encounter and explore potential strategies to overcome them. Acumatica ERP is a robust solution poised to revolutionize the beverage industry supply chain. Acumatica offers a tailored approach to meet beverage companies' unique challenges. From demand forecasting to inventory optimization and seamless integration across the supply chain, Acumatica empowers businesses to navigate volatility, improve efficiency, and achieve greater agility in responding to dynamic market demands. Figure 3 highlights the role of ERP in Beverage Supply Chain.

Figure 3: Role of ERP in Beverage Supply Chain

Energy is the secret ingredient in every food and beverage facility – but with 30% of global energy consumed by the sector, it's also a major cost driver. High energy use leads to rising operational expenses and 20% of global CO emissions. By integrating digitalization and smart automation with sustainable practices, they are increasing efficiency, reducing costs, and improving profitability (**Siemens, 2025).**

Sustainable Development Goals (SDGs) : Integrating Environmental, Social, and Governance (ESG) criteria and Sustainable Development Goals (SDGs) is essential for building resilient, ethical, and transparent supply chains. Companies are increasingly prioritizing ESG to mitigate risks (e.g., child labor, emissions), meet regulatory demands like the CSRD, and align with UN goals to enhance brand reputation, ensure compliance, and improve operational efficiency. There are 17 goals in total, each created to emphasise the interconnected environmental, social and economic aspects of sustainable development SDG 12 – Responsible production and consumption and SDG 13 – Climate Action are focusing on achieving sustainable supply chains. Companies map ESG efforts to specific SDGs, such as SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action), and SDG 8 (Decent Work and Economic Growth). Figure 4 describes SDGs

Figure 4: Sustainable Development Goals

Integration of SDGs with ESGs : The ESG performance of a nation significantly influences its economic growth. While some studies have identified a positive correlation between ESG practices and economic advancement, others have reported either negligible or adverse effects. Figure 5 shows the correlation between ESG & Natural Resource Rent and Natural Resource Rent (NR). Also correlations between NR and Technology, SGDs & Economic are highlighted.

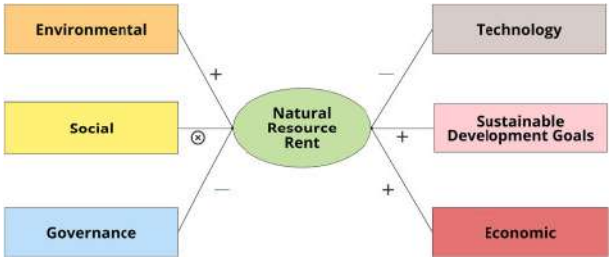

Figure 5: Correlation between ESGs and SDGs : Environmental and Natural Resource Rent (NRR) are having positive correlation, whereas the governance is having negative correlation. NRR is having positive correlation on economic and SDGs. NRR is having on technology. These findings are based on the data collected from 30 plus OCED countries.

Conclusion : Many companies in FSC and BSC are yet to adopt the circular economy strategies. The countries like USA, China etc have already adopted CE practices in creating sustainable supply chains. In India not many research works have been done in FSC and BSC with respect to circular economy and sustainable supply chains. The food and beverage (F&B) sector sits at the centre of some of the world's most pressing sustainability challenges, from deforestation and biodiversity loss to water scarcity and human rights violations. Agriculture alone accounts for nearly 70 percent of global freshwater withdrawals and is a major driver of land-use change and emissions. As global supply chains grow more complex and climate risks intensify, businesses face mounting pressure from regulators and consumers alike. To align business activities with the Paris Agreement goal to limit global warming to 1.5°, companies may disclose and set targets to mitigate their emissions. The global food system contributes up to 37% of total annual emissions. Major food & beverage processing companies heavily contribute to food system emissions through their supply chains. Many research studies have highlighted the circular economy methodologies focus on environmental sustainability & economic sustainability not much on people / societal sustainability. Now the companies are focusing on societal sustainability through Corporate Social Responsibility (CSR) activities. The CSR activities scope has been enlarged to environmental dimension also. There are other dimensions such as process sustainability and procedure sustainability have to be concentrated.

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STRENGTHENING INDIA'S GENOMIC SURVEILLANCE EFFORT THROUGH THE GATI SHAKTI PLAN

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The COVID-19 pandemic demanded the rapid deployment of genomic surveillance in India to sequence viral genomes and track mutations. However, sophisticated scientific expertise was frequently undermined by the inability to secure essential materials at the necessary time. Indian laboratories operated under a fragile "on-demand" system where the absence of a single component, often requiring imports and continuous ultra-cold storage, halted entire operations. These disruptions occurred not due to a lack of technical capacity, but because the supporting supply chains were fragile, linear, and excessively dependent on a limited number of international suppliers.

Integrating Closed-Loop Supply Chain Principles into Genomic Surveillance

To transition from a linear to a circular model, India must replace fragile, one-way supply chains with Closed-Loop Supply Chain (CLSC) principles1 that prioritizes reusability and recycling of critical genomic resources. In a traditional linear system, laboratories depend on a direct flow of materials from foreign suppliers. This creates a single point of failure where an import delay or a supplier's business decision can halt critical disease tracking. A CLSC approach transforms this into a flexible, circular system that "loops" back to utilize certified domestic alternatives or redistributes, repurposes existing supplies from low-demand regions to active outbreak "hotspots." By implementing this thinking, India can ensure operational continuity even when global markets seize, shifting from responding to crises after they occur to a proactive defense that contains local disease clusters before they escalate into widespread epidemics.

The Materials and Supply Constraint

Genomic sequencing is a precise, multi-step process encompassing extraction, amplification, and analysis of genetic material where each stage necessitates high-quality consumables such as specialized enzymes, reagents, and pipette tips. Experiences during the COVID-19 pandemic revealed that laboratory output was frequently constrained not by technical capacity, but by systemic bottlenecks including reagent scarcity, prohibitive costs, and significant import delays. To address these vulnerabilities, strategic technical adaptations like the ARTIC HELP protocol2 serve as practical demonstrations of CLSC principles3 by proving that manufacture-specific supplies can be successfully replaced with generic, locally available enzymes. By proactively certifying these accessible alternatives, facilities can stockpile generic alternatives before a crisis occurs, significantly reducing dependence on specific vendors and the uncertainties of international logistics.

Critical Supply Chain Fault Lines

India's genomic surveillance capacity is constrained by a series of interlocking logistical and structural vulnerabilities. Central to these challenges is **cold chain complexity**, where the requirement for strict -20°C to -80°C environments create multiple failure points during transit that risk rendering high-value shipments unusable. This is compounded by **specificity constraints** and **perishability pressures**, as rigid, brand-specific protocols limit substitution options while short reagent shelf lives force a difficult choice between being ready for sudden outbreak and risking expensive supplies expiring before use. Furthermore, a heavy **import dependence**4 leaves the domestic supply chain vulnerable to geopolitical shifts and currency volatility, often resulting in delays in producing critical health information during crises. These issues are intensified by **demand unpredictability**4, which can overwhelm procurement systems with sudden tenfold increases in sequencing requirements, and **infrastructure integration gaps**7, where delays in meeting stringent biosafety or electrical standards leave essential equipment idle.

The Last-Mile Challenge: Lessons from Neglected Tropical Diseases and Zoonotic Threats

Strategic parallels between Neglected Tropical Disease (NTD) programs and genomic surveillance reveal that technological capability is ineffective without a resilient "last-mile" delivery system. NTD initiatives demonstrate that diagnostics and medicines only succeed when accurate demand planning and localized distribution prevent materials from being trapped in central hubs or expiring in remote facilities. For India, this infrastructure is a matter of survival; with zoonotic pathogens like orthobolaviruses (up to 90% mortality) and Nipah (40%–75% mortality, with a recent January 2026 outbreak)5, the window for containment is measured in hours rather than days.

Genomic intelligence is effectively lost if reagents fail to reach local labs during a crisis. Standard supply models, built for cost-efficiency during steady demand, collapse when air and road transport are disrupted by outbreaks. To prevent epidemics, India must pivot from "one-size-fits-all" logistics to country-led strategies that locate reagents proactively in regional hubs, securing regional readiness before a pathogen becomes widespread.

Gati Shakti National Master Plan: The Infrastructure Backbone for Genomic Surveillance

Gati Shakti, India's National Master Plan (NMP) for multi-modal connectivity, offers an unprecedented opportunity to reimagine public health logistics through integrated, GIS-based planning. While traditionally associated with industrial corridors, the platform integrates epidemiological surveillance with supply chain logistics. This real-time disease data dictates resource allocation and supply "burn rates". Genomic surveillance identifies the "state" of population health, which in turn generates an immediate signal for

logistics. By leveraging Gati Shakti's layered infrastructure data, materials managers can convert this surveillance data into "logistics intelligence", identifying optimal cold-chain routes across diverse geographies. The integration dynamically steers logistic networks and supplies to regions where disease risks and health threats emerge, allowing the network to rebalance the flow of critical reagents toward areas where pathogen activity is highest.

Gati Shakti's NMP transforms genomic surveillance from a fragmented process into a coordinated national response through three strategic advantages:

Multimodal Cold-Chain Optimization6**:** Using GIS-based mapping of infrastructure gaps and transport nodes (road, rail, air), the NMP identifies the fastest routes for temperature-sensitive reagents. This minimizes transit times, preventing sample degradation from rural sites and accelerating outbreak detection.

Strategic Facility Positioning7: The NMP utilizes integrated logistics and healthcare data to determine the optimal location for regional hubs and supplies. By transitioning from a city-centered model to a decentralized network, the NMP ensures essential resources are stationed within high-risk regions prone to animal-to-human disease transmission.

Domestic Manufacturing & Cross-Ministry Integration8**:** Lower logistics costs incentivize domestic biomanufacturing hubs, reducing import reliance. The integration of 44 Central Ministries (including Health, Agriculture, and Environment) operationalizes the One Health approach advocated by United Nations Environment Programme (UNEP), ensuring optimized material flow when environmental, veterinary, and medical labs must collaborate on emerging pathogens.

Building the Resilient Supply Chain: A Strategic Framework

For materials management professionals tasked with strengthening India's genomic surveillance infrastructure, the following strategic framework integrates CLSC principles with Gati Shakti's capabilities:

Phase 1: Risk Mapping and Validation – Identify dependencies on single suppliers and import-heavy workflows. Laboratories must proactively validate generic alternatives (via ARTIC HELP) and establish rotation protocols to balance preparedness against reagent expiration.

Phase 2: Strategic Positioning – Use Gati Shakti's GIS to locate regional hubs near zoonotic hotspots with reliable power and cold-chain access. Implement a multi-level storage network with reverse logistics capabilities to shift supplies from quiet zones to active outbreak sites.

Phase 3: Diversification and Domestic Growth – Pre-qualify multiple global suppliers while incentivizing domestic manufacturing centers. These centers should be positioned near Gati Shakti transport nodes to serve both Indian laboratories and regional export markets.

Phase 4: Last-Mile and Readiness –India must audit its cold-chain infrastructure between ports and laboratories. This should be paired with mandatory site-readiness audits to ensure facilities can receive supplies. Pre-signed emergency agreements with logistics providers should be finalized to guarantee priority transport if commercial capacity fails during a crisis.

Phase 5: Dynamic Adaptation – Transition to a system that tracks stock levels instantly across the country. Integrate genomic surveillance data with predictive analytics to trigger supply chain rebalancing the moment a demand surge is detected, followed by iterative after-action reviews.

Conclusion

Given the lethality of zoonotic pathogens, rapid reagent delivery is a moral necessity, as minor logistical delays can irreversibly compromise outbreak containment. While the UNEP emphasizes that long-term prevention relies on environmental and wildlife management, India must simultaneously build the supply chain resilience necessary to manage the spillovers that occur in the interim. By integrating **CLSC principles** with **Gati Shakti's** infrastructure platform, India can transform its surveillance from a fragile, import-dependent capability into a robust early warning system. This is a call for materials managers to apply rigorous optimization such as alternative sourcing, strategic stockpiling, and reverse logistics, to life-saving infrastructure. Connecting India's world-class scientists with a Gati Shakti-informed logistics network empowers the nation to move essential supplies to combat emerging pathogens, containing local disease clusters from escalating into global catastrophes.

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THE RUPT REALITY OF SUPPLY CHAINS: WHY MICRO-INNOVATION AND MICRO-INTELLIGENCE MATTER

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Supply chains have entered a phase of uncertainty that extends beyond traditional volatility and complexity. The present operating environment increasingly reflects a RUPT reality - Rapid, Unpredictable, Paradoxical, and Tangled. Disruptions now move faster than conventional response cycles, risks interact across multiple tiers simultaneously, and decision-makers operate amid contradictory pressures of cost, resilience, digitization, and sustainability. Under such conditions, large-scale transformation programs alone struggle to deliver real-time stability. What increasingly matters is the ability to adapt continuously through micro-innovation supported by AI-enabled micro-intelligence.

"In a RUPT world, supply chains no longer collapse from a single big disruption - they unravel through dozens of small failures occurring at once."

The RUPT Condition and the New Nature of Disruption

RUPT conditions describe a world where disruptions arrive without linear warning signals, spread across interconnected networks at speed, and generate effects disproportionate to their apparent cause. A delay at a tier-three supplier can trigger plant shutdowns across continents. Inventory shocks propagate through multiple planning cycles in days rather than weeks. Logistics disruptions intersect with regulatory shifts, cyber risks, and sustainability pressures, creating tangled interdependencies.

This environment challenges the assumption that resilience can be built primarily through buffers, redundancies, and long-horizon forecasts. Instead, resilience now depends on the capacity to sense weak signals early and respond through fast operational adjustments.

What Makes RUPT Different?

- Disruptions travel faster than planning cycles
- Small failures create disproportionate ripple effects
- Cause–effect relationships are blurred
- Decisions involve conflicting priorities simultaneously

Micro-Innovation as an Operational Survival Strategy : Micro-innovation refers to small, rapid, frontline-led improvements embedded directly into daily supply chain operations. It differs from traditional innovation in scale and intent. Rather than redesigning entire systems, micro-innovation focuses on continuous, localized problem-solving that improves responsiveness at the point where risks materialize.

In procurement, micro-innovation appears through short-term sourcing experiments, rapid vendor performance recalibration, and tactical contract flexibility. In inventory management, it includes dynamic buffer resizing, SKU rationalization sprints, and short-cycle demand reclassification. In warehousing, layout adjustments, pick-path refinements, and shift-level productivity tweaks represent typical examples. In transportation, it emerges through route experimentation, load consolidation pilots, and adaptive carrier selection.

Under RUPT conditions, these frequent micro-adjustments collectively build resilience faster than any single transformation program.

"Resilience in RUPT supply chains is built through hundreds of small adaptations, not one large transformation."

AI as Micro-Intelligence at the Operational Edge

While artificial intelligence is often associated with large digital platforms, its most powerful contribution under RUPT conditions lies in its role as micro-intelligence. Micro-intelligence refers to narrowly focused, real-time, decision-support applications of AI embedded into daily operational workflows.

In procurement, micro-intelligence supports short-term price volatility alerts, supplier reliability risk scoring, and shipment delay forecasting. In inventory planning, it enables short-horizon demand sensing, slow-moving inventory detection, and micro-level reorder sensitivity analysis. In warehousing, AI-driven micro-intelligence assists with congestion identification, slotting optimization, and labour allocation. In transportation, it flags route disruptions linked to weather, congestion,

or capacity strain.

Rather than replacing human judgment, micro-intelligence strengthens it by transforming fragmented data into actionable operational signals. Under RUPT conditions, this human–AI partnership becomes a stabilizing cognitive layer across the supply chain.

Micro-Intelligence in Daily SCM Decisions

- Price fluctuation alerts for buyers
- Short-term demand sensing for planners
- Pick-path optimization for warehouse supervisors
- Delay prediction for transport coordinators

The Behavioural Foundation of Micro-Innovation

Micro-innovation thrives only when supported by behavioural readiness. It requires decentralized authority, rapid feedback loops, and tolerance for controlled experimentation. RUPT conditions amplify decision stress, as compressed response windows leave little margin for error. Micro-innovation reduces this cognitive load by shifting problem-solving closer to the operational front.

Teams trained in rapid experimentation, weekly performance reviews, and learning-oriented metrics demonstrate greater confidence under uncertainty. Leadership roles evolve from command-based control to capability-based enablement, where operational learning becomes a strategic asset.

Micro-Innovation and Large Transformation: A Complementary Relationship

Large digital and structural transformation programs remain essential for long-term competitiveness. However, under RUPT conditions, their effectiveness depends heavily on the organization's micro-innovation maturity. Rigid architectures, extended deployment timelines, and delayed realization of benefits limit the protective capacity of transformation alone.

Micro-innovation prepares the ground by strengthening process discipline, improving data quality, enhancing digital adoption readiness, and increasing change acceptance. Micro-intelligence ensures that transformation reaches the operational edge where RUPT disruptions originate. In this sense, micro-innovation does not replace transformation, it de-risks it.

"Big systems build scale; micro-intelligence builds sensitivity."

Strategic Implications for Supply Chain Leadership

Leadership in a RUPT environment moves beyond structural optimization toward adaptive orchestration. Competitive advantage increasingly arises from sensing velocity, decision speed, and learning intensity rather than from size alone. Supply chains that institutionalize micro-innovation supported by micro-intelligence experience faster disruption detection, shorter recovery cycles, and stronger frontline ownership.

Resilience in such systems emerges dynamically not through static buffers, but through continuous micro-adjustments reinforced by intelligent operational feedback.

Conclusion

The RUPT reality of supply chains represents a structural shift in how uncertainty is experienced and managed. Rapid shocks, unpredictable interdependencies, paradoxical trade-offs, and tangled networks have become permanent operational conditions. In this landscape, success depends less on episodic reinvention and more on continuous micro-level evolution.

Micro-innovation provides the behavioural engine of adaptation, while AI-enabled micro-intelligence supplies the cognitive fuel. Together, they form the true backbone of resilient, learning-oriented supply chains capable of surviving and thriving under RUPT conditions.

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GEN Z VALUE CHAIN TANSFORMATION IN SUPPLY CHAIN MANAGEMENT

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Abstract: Technology driven by sustainable supply chain, Gen Z is moving from cost-focussed to value driven transparent, ethical system, demanding real-time visibility, fast delivery, and eco-friendly sourcing in supply chain

Gen Z prioritises sustainability over various brands specialising, favouring branded products, that are eco-friendly, circular, ethically sourced, on a cloud based inventory adopted system, centralised so as ensure that inventory is present, when needed, as they provide real-time, visibility, across value chain in supply chain.

Introduction: Demanding speed, sustainability, transparency, with the adoption of congestion pricing, in urban areas, expects Gen Z, without interruptions, delay, proper information, financial transactions, can create delivery, in most congested areas, to implement logistic sustainable according to economic adjustments, along the value chain in supply chain.

Demanding high transparency Gen Z is accelerating supply chain, transformation, into sustainability, ethical, value chain practices, which directly challenges traditional concentrated risk, arising from organisation depending upon various of suppliers, customers, work-force, so as to aim to reduce risk, on the preference of customised products, thus creating a new complex, concentrated dependences on specific sustainable agile (capable of adapting to demanding fluctuations) suppliers in supply chain.

Purpose of the Study: Transforming supply chain management in a rapid fulfilment of customer's desire, demand driven, on a circular eco-system,(sustainable closed loop system designed to minimise waste) Gen Z from linear to agile, (forecast driven process into flexible demand driven response) being transparent in value chain to a group of customers commanding significant purchasing power, on brands to adopt advanced technology, artificial intelligence, Block chain on a real-time inventory visibility on sourcing in supply chain.

Adoption of technology Gen Z influences technology, driven by fundamental transformation in supply value chain, linear (raw-material, production, distribution, wastage), driven by cost, agile, **(ability to adapt to market fluctuations),** transparent, sustainability, focussed on ethical network, **(frame work of practices, technology**) demands immediate last-mile visibility, influencing to adopt to technology, artificial intelligence, machine learning, internet of things, enforcing ethical standards (**adapting fairness, transparency**) in supply chain.

Research: Understanding the influence on adoption of digital technology, consumer behaviour, utilisation of work-force, on the demand of sustainability, need from shift from linear **(raw material, production, distribution, use)** to agile,(**to rapidly efficiently adapt to unexpected shifts)** on ethical technology, on understanding the shift of demand analysis, from Gen Z preference for sustainable over the brand name, ethical sourcing, forcing organisation to transit from green logistic circular economy, so as to increase traceability in supply chain.

Driving rapid technological changes in warehouse operations in supply chain, Gen Z is bringing sustainable transformation, focusing on agility, digital transparency, including on adopting artificial intelligence, internet of things, automation, adopting faster technological fulfilment, thus integrating friendly protection to meet the sustainability demands, utilising on giving priority for a flexible working conditions in supply chain.

Discussions: Meeting immediate consumer demand, being transparent on services, adjourning to next-day delivery, prioritising last-mile delivery, having organisation adopt to artificial intelligence, Gen Z is willing to adopt demand forecasting, reduce inventory, adopt perpetual inventory systems, as to willing to give preference to sustainability to ethically sourced products, thus giving priority to value chain, towards in a circular economy, on transferring through technology, artificial intelligence, internet of things in supply chain.

Rapid digitalisation using artificial intelligence, having

better demand forecasting, on a better inventory control, on a real-time affect on the value of the consumer, turning on brand product, based on the changes in shift, the value chain into a cost-centre, being competitive, on a value based advantage, required to compete with a circular economy, reducing waste in supply chain.

Findings: Transformation for linear cost (managing rise in operating expenditure, fuel, labour, logistics) Gen Z is focussed on an agile transparent (use of real-time, visibility, open communication,) on a sustainability network, driven by digital value chain, having a mindset for ethical consumer behaviour in supply chain.

Procurement of products, with the intent of returning, reverse logistics in Gen Z does becomes a core competency in supply chain, with value chain requiring artificial intelligence, internet of things, manage the flow of high value of returns, along Omni-channel, inventory visibility, based on central cloud based system, to provide full stock visibility, allowing manufacturers, wholesalers, distributors, retailers to fulfil orders from the most efficient mode in supply chain.

Adoption of Block chain for end-to-end traceability in supply chain, also with the implementation of eco-friendly artificial intelligence on logistic adopted system, fostering a collaborated driven purpose for work place, so as to attract Gen Z talent, thus influencing generations to buy responsible sourcing products, having value chain sustainability in supply chain practices, on the brands that keep end-to-end priority in supply chain.

Conclusions: Workforce entering in logistic, are demanding flexibility, remote sense of work, purpose driven by policy, regulations, last-mile developments, which is liable to act as a digitalisation with Gen Z entering into readily adapting artificial intelligence, machine learning, Internet of Things, automation, Block chain tools so as to optimise operations in supply chain.

Investment in technology is a must to adopt Gen Z, implementation of cutting edge technology, adopting supply chain systems, thus providing access to artificial intelligence, internet of thing, automation, on a continuous learning opportunity, with the emerging technology, with a value chain initiative in Environmental, Social, Governance, responsibility, with an opportunity to meaningful impact in supply chain.

Recommendations: Always Better Analysis on the transformation, has been evolved as merely functional, through technology, being competitive, having advantage through technological integration, being ethically accountable, so to demand better delivery, as the organisation is to adopt Gen Z, with the best technology, so as to neglect the traditional intermediaries of distribution (facilitate to be independent to move the goods from production to final consumer) in supply chain.

Perpetual inventory adopted system is considered as the technological importance of transforming on to providing real-time value chain data, being visible, thus giving preference to demand, speed, transparency, sustainable, satisfying Gen Z, on forcing a shift from a linear (**from raw material extraction to production, distribution, disposal**) to proactive **(anticipating disruption, rise in demand changes)** physical ecosystem **(interconnected with network resources involved in sourcing**) being digitalised in supply chain.

Transparency in Gen Z, on adoption of Block chain, investment in logistics, using circular packaging, electrically operated transportation, on a real-time value chain, using artificial intelligence, demand forecasting, regenerative, restorative, socially, sustainable, being digital capable, traceable, frictionless, to meet delivery, consumer demand, authentication, speed in supply chain.

Limitations: Shifting towards faster sustainability, being transparent in operation, accelerating the change in Just-in-time inventory system, Gen Z influences supply chain, by intriguing supply chain, with the accent (emphasis) on having the integration on real time artificial intelligence data, circular economy, so as to align to the speed, with sustainability in value chain in supply chain.

Visibility in ordering, real-time tracking, bettering order positions, shipping, updating by e-mail, artificial information driven forecasting, leveraging forecasting by predictive analysis, Gen Z is to keep the moving stock-keeping-units in a stock position, close to the distribution, demand centres, by bringing in automation systems, robotic, conveyor adopted value chain systems, to increase speed, also on the essential requirements in supply chain.

Limitations: Determining optimum stock-levels, on inventory decisions making, refers to strategic process, on Gen Z replenishment to meet customer's demand, efficiently in calculating re-order levels, safety stock, analysing turnover, on considering the ratio of cost of goods sold, on the value chain, to the average inventory as key performance indicator **(the average stock on hand over a period**) in supply chain.

Strong inventory flow, high turnover rate, reflects sales alignment, while low rate suggests overstock, as the demands becomes sluggish, Gen Z is to effectively control inventory, strategies, incorporate trade off to analyse on the holding stock, **(require balancing costs of carrying much against risk**) costs, **(minimise operational cost, maximise customer service levels)** apply quantitative value chain**, (optimise end-to-end operations**) Economic Order Quantity, in adopting artificial intelligence, technology, on the consumer behaviour, work force dynamics **(shifting rapidly due to artificial intelligence, internet of things**) on value chain in supply chain.

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INDIA'S COMPONENT WAREHOUSING SAFE HARBOR: A COMPETITIVE TAX PROPOSITION FOR GLOBAL MANUFACTURERS

ARCHANA RAO

In Budget 2026, the central government introduced a series of tax and customs reforms to strengthen India's position as a global manufacturing and services hub. It placed particular emphasis on expanding safe harbor provisions, simplifying compliance requirements, and providing long-term certainty to global investors.

New safe harbor provisions are expected to be embedded within the new Income Tax Act, which will come into force from April 1, 2026.

The Budget 2026-27, announced on February 1, 2026, introduces a series of tax and customs reforms and places the expansion of safe harbor provisions, simplification of compliance obligations, and long-term certainty for global investors at the center of its reform agenda.

The central government has also introduced a safe harbor regime for component warehousing in bonded facilities, along with targeted exemptions for non-residents supplying manufacturing inputs.

Safe harbor expansion for non-residents and bonded operations

Five-year income tax exemption for capital asset suppliers

Non-residents supplying capital goods, equipment, or tooling to toll manufacturers operating in bonded zones will be eligible for a five-year income tax exemption.

This measure is designed to facilitate the seamless movement of production assets into India and to reduce tax friction for global manufacturers supporting Indian manufacturing operations.

Safe harbor for component warehousing in bonded warehouses

The Budget 2026-27 introduces a specific safe harbor regime for non-residents that engage in component warehousing within bonded facilities.

Under this framework, eligible taxpayers must declare a minimum profit margin of 2 percent of invoice value, and tax authorities will refrain from initiating transfer pricing adjustments for covered activities when taxpayers comply with the prescribed margin.

At India's prevailing corporate tax rate, a 2 percent margin results in an effective tax burden of approximately 0.7 percent of total turnover, thereby delivering a low and predictable tax outcome for qualifying warehousing operations.

This reform shifts the regime from a benchmarking-based transfer pricing approach to a formula-driven income attribution model.

Legislative framework and rule-based incorporation

Although announced in the Budget speech and incorporated in the Finance Bill proposals, the safe harbor becomes legally operative only after:

- Passage of the Finance Bill 2026-27 by the Indian Parliament and Presidential assent; and
- Notification of the corresponding Safe Harbor Rules by the Central Board of Direct Taxes (CBDT).

For transactions beginning April 1, 2026 (FY 2026-27), the provision is expected to be embedded within the Income Tax Act, 2025 and the **Draft Income Tax Rules, 2026**, which will govern the new tax regime. Transitional amendments under the Income Tax Act, 1961 may apply for the closing months of FY 2025-26, but from Assessment Year 2026-27 onward, the new Rules will form the operative framework.

Scope of the safe harbor under Rule 99 of the draft Income Tax Rules, 2026

Under the **new income tax law, 2026, Rule 99** defines the structural parameters of the safe harbor regime applicable to bonded component warehousing.

Eligible assessee

The regime applies to a foreign company that:

- Stores components in a warehouse located in

a custom bonded area as defined under Section 65 of the Customs Act, 1962;

- Supplies those components to an Indian contract manufacturer; and
- Exercises the safe harbor option in accordance with Rule 100.

Eligible business activity

The eligible business consists of:

- Storage of components in a bonded warehouse; and
- Sale of those components to a contract manufacturer for use in manufacturing specified electronic goods.

The safe harbor therefore applies to a clearly defined supply-chain model integrating bonded warehousing and contract manufacturing.

Contract manufacturer : A contract manufacturer refers to an Indian company producing specified electronic goods on behalf of the foreign enterprise within a custom bonded area.

Gross receipts as the base : For this category, gross receipts represent the aggregate invoice value of components sold from the bonded warehouse to the contract manufacturer, including amounts paid, payable, received, or deemed to be received.

The prescribed 2 percent margin is applied to this gross receipt base, ensuring formula-based income attribution.

Specified electronic goods

The regime covers components used in the manufacture of:

1. Mobile phones
2. Laptops, tablets, and all-in-one personal computers
3. Servers and ultra-small form factor devices
4. Sub-assemblies of the above products
5. Hearables, wearables, and related accessories

This sector-specific targeting aligns the safe harbor with India's electronics manufacturing strategy.

Transfer pricing position before Budget 2026-27

Absence of a dedicated safe harbor

Under the earlier Safe Harbor Rules (Rule 10TD of the Income Tax Rules, 1962), prescribed margins existed for certain international transactions, including:

1. IT and ITES services
2. KPO services
3. Contract R&D services
4. Intra-group loans
5. Corporate guarantees
6. Manufacture and export of core and non-core auto components
7. Certain low value-adding intra-group services

However, component warehousing and bonded warehouse operations were not expressly covered.

Consequently, multinational enterprises engaged in cross-border warehousing transactions were required to determine arm's length pricing under conventional transfer pricing methods such as the Transactional Net Margin Method (TNMM) or Comparable Uncontrolled Price (CUP) method. This exposed warehousing arrangements to routine audits and benchmarking disputes.

Previous transfer pricing treatment in India

In practice, component warehousing was generally characterized as a routine logistics support or limited-risk distribution function. Arm's length margins were determined through:

- Comparable logistics and distribution companies; and
- Detailed Functional, Asset, and Risk (FAR) analysis.

Tax authorities frequently scrutinized:

- Whether the Indian entity was appropriately classified as a low-risk service provider;
- Whether inventory and operational risks were correctly allocated; and
- Whether declared margins were understated.

Given that warehousing functions operate on structurally thin margins—typically between 2 and 3 percent—even minor adjustments could lead to:

- Disproportionately high tax additions;
- Increased litigation exposure; and
- Extended transfer pricing assessments.

Lack of formula-based certainty

Prior to the Budget 2026 proposal, no prescribed formula-driven margin guaranteed immunity from transfer pricing scrutiny for bonded warehousing functions.

Even commercially realistic margins remained vulnerable to:

- Comparability challenges;

- Functional recharacterization; and
- Mark-up disputes.

Accordingly, the regime lacked codified certainty for bonded warehousing activities.

Reduced transfer pricing risk and compliance certainty

Under the newly introduced safe harbor framework:

1. Companies declaring the prescribed 2 percent margin are insulated from detailed transfer pricing audits for the covered activity.
2. Income attribution becomes rule-based rather than negotiation-driven.
3. Litigation exposure and audit uncertainty are materially reduced.

Unlike incentive-based regimes in certain low-tax jurisdictions that depend on periodic eligibility reviews, substance testing, or policy renegotiation, a codified safe harbor offers structural predictability.

For multinational groups, certainty and administrability often outweigh marginal differences in statutory tax rates.

Why predictability matters for component warehousing

Component warehousing is:

- High in transaction volume;
- Operationally critical to manufacturing continuity; and
- Structurally low-margin, typically 2-3 percent.

In such functions, tax unpredictability can materially distort cost planning, inventory strategies, and supply chain efficiency.

A standardized 2 percent margin enables:

- Clear and replicable pricing models;
- Reduced need for defensive documentation;
- Faster internal approvals for capital deployment; and
- Lower long-term compliance costs.

In global supply chain management, predictability reduces total cost of ownership- not merely statutory tax expense.

Strategic implications for multinational manufacturers

The safe harbor framework sends a clear signal to multinational manufacturers evaluating regional warehousing hubs under "China +1" diversification strategies.

By offering:

1. Competitive post-tax outcomes;
2. Reduced regulatory friction;
3. Lower litigation risk; and
4. Integration with bonded manufacturing ecosystems.

India has strengthened its case as a viable location for regional component hubs, inventory staging operations, and supply consolidation centers.

Warehousing decisions frequently precede and influence downstream assembly and production footprint expansion. As such, tax certainty at the warehousing stage can have multiplier effects on broader manufacturing investment.

Alignment with India's manufacturing strategy

The component warehousing safe harbor advances India's broader objective of integrating more deeply into global value chains. By encouraging companies to warehouse components locally, the policy:

- Enhances supply chain resilience;
- Improves proximity between storage and assembly operations; and
- Strengthens ecosystem development around manufacturing clusters.

Instead of relying solely on headline tax holidays, India is using this policy to create structural predictability and deliver competitive effective taxation.

Conclusion : The component warehousing safe harbor is not just about offering the lowest possible tax rate. It is about delivering clarity, certainty, and administrable compliance.

For multinational manufacturers operating on thin warehousing margins, a stable effective tax outcome of approximately 0.7 percent of turnover, combined with minimal dispute risk, may be more attractive than a nominally lower but uncertain regime elsewhere.

In the context of global supply chain realignment, India's proposal positions tax policy as a strategic lever, reinforcing the country's role not only as a production base but also as a reliable logistics and component hub within Asia.

Source: www.india-briefing.com

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ROUTE OPTIMIZATION: A GUIDE TO MAXIMIZE LOGISTICS EFFICIENCY

Route optimization in logistics plays an important role in streamlining supply chains and ensuring the timely delivery of goods. However, traffic congestion, rising fuel costs, and inefficiencies continue to impact profitability. Research indicates that businesses implementing route optimization strategies can achieve significant cost savings and improved delivery efficiency.

By using Artificial Intelligence (AI), advanced algorithms, and real-time data, businesses can find the most efficient routes, bypass congestion, and adapt to unforeseen delays. Studies show that optimized routing can reduce fuel consumption by 62%, greenhouse gas (GHG) emissions by 62%, and travel distance by 10% per month across various industries.

This guide explores how route optimization works, its benefits, and how businesses can implement it to enhance efficiency, cut costs, and improve customer satisfaction.

What is Route Optimization in Logistics?

Route optimization in logistics focuses on determining the most efficient delivery routes by analyzing traffic, schedules, vehicle capacity, and fuel usage. The goal is to reduce costs, improve delivery times, and enhance fleet efficiency.

Logistics route optimization plays a crucial role in ensuring that companies meet tight deadlines, minimize fuel consumption, and maximize operational efficiency. By utilizing advanced software, businesses can plan optimal routes, reducing unnecessary delays and enhancing overall fleet performance. By understanding how route optimization enhances logistics efficiency, we can now explore why it is essential for businesses striving to reduce costs and improve operations.

Why is Logistics Route Optimization Essential?

Logistics route optimization significantly impacts a company's operational costs and efficiency. Here's why it is essential:

1. Cost Reduction

By optimizing routes, businesses can:

- Lower fuel costs by selecting the shortest, least congested paths.
- Reduce overtime and labor costs through better scheduling.
- Minimize vehicle maintenance expenses by preventing unnecessary wear and tear.

2. Faster Deliveries and Improved Efficiency

Route optimization ensures:

- Shorter transit times by avoiding detours.
- Better scheduling using traffic pattern predictions.
- Higher on-time delivery rates boost customer satisfaction.

3. Enhanced Fleet Utilization

Optimized routing helps:

- Reduce idle time and maximize vehicle productivity.
- Enable more deliveries per route, improving efficiency.
- Ensure better load distribution, preventing underutilization or overload.

4. Environmental Benefits

Efficient routing contributes to sustainability by:

- Lowering carbon emissions through reduced fuel consumption.
- Cutting unnecessary mileage, promoting eco-friendly logistics.
- Contributing to green logistics initiatives and corporate sustainability goals.

Drive sustainability in your freight operations with Freight Sustainability. Optimize routes, track emissions, and reduce your carbon footprint effortlessly.

5. Real-time Adaptability

Modern logistics face traffic congestion, weather disruptions, and last-minute changes. Logistics Route optimization enables:

- Real-time rerouting based on live conditions.
- Dynamic scheduling to accommodate urgent deliveries.
- Supply chain continuity despite unexpected roadblocks.

Now that we understand why route optimization is vital, let's take a closer look at how route optimization in logistics actually works.

How Route Optimization Works : Route optimization goes beyond finding the shortest path - it identifies cost-effective and efficient routes while factoring in real-world variables. Modern route optimization relies on advanced technology, real-time data, and intelligent algorithms to streamline logistics operations. Here's a step-by-step breakdown of how route optimization works:

Data Collection and Input

Before optimization begins, the system gathers crucial logistics data, including:

- **Delivery addresses and destinations**: Where goods need to be transported.
- **Traffic and road conditions**: Real-time congestion, road closures, and accidents.
- **Vehicle constraints**: Load capacity, fuel efficiency, and availability.
- **Driver schedules and work hours**: To ensure compliance with labor laws.
- **Customer delivery preferences**: Specific time windows or priority shipments.

This data is collected from various sources, such as Global Positioning Systems (GPS) trackers, weather APIs, traffic monitoring systems, and historical delivery records.

Route Planning and Optimization Algorithms : Once the data is gathered, route optimization software processes it using complex algorithms to determine the most efficient routes. These algorithms consider:

- **Shortest and fastest routes**: Based on real-time and historical data.
- **Multi-stop sequencing**: Optimizing the order of deliveries for maximum efficiency.
- **Fuel efficiency**: Selecting routes that minimize fuel consumption.
- **Traffic avoidance**: Identifying and bypassing congested areas.
- **Cost efficiency**: Balancing fuel, labor, and maintenance expenses.

Real-Time Adjustments and Dynamic Routing : One of the biggest advantages of modern route optimization is its ability to adjust routes in real-time. Dynamic routing systems continuously monitor:

- **Live traffic updates**: Rerouting vehicles if unexpected congestion occurs.
- **Weather conditions**: Adjusting routes to avoid extreme weather disruptions.
- **Last-minute order changes**: Re-optimizing delivery schedules as new orders come in.
- **Driver location and performance**: Ensuring optimal fleet utilization.

Integration with Logistics and Fleet Management Systems : Route optimization software integrates seamlessly with Transportation Management Systems (TMS) and Fleet Management Systems (FMS) to enhance operational efficiency. These integrations help with:

- **Automated dispatching**: Assigning drivers and vehicles to optimized routes.
- **Live tracking and monitoring**: Providing real-time visibility of fleet movements.
- **Electronic Proof of Delivery (ePOD)**: Digital confirmation of completed deliveries.

This integration streamlines dispatch, tracking, and proof of delivery. Now, let's look at the technologies powering route optimization.

Technology Behind Route Optimization : Route optimization in logistics is powered by cutting-edge technology that enables businesses to plan, monitor, and adjust delivery routes with precision. From AI-driven algorithms to real-time GPS tracking, modern logistics companies rely on sophisticated tools to enhance efficiency, reduce costs, and improve customer satisfaction. In fact, AI and robotics are expected to enhance logistics productivity by more than 40% by 2035.

Here's a breakdown of the key technologies behind route optimization:

Artificial Intelligence (AI) and Machine Learning (ML)

ML and AI continuously refine route optimization by analyzing past performance. These technologies help:

- Analyze vast amounts of traffic and historical delivery data to predict optimal routes.
- Identify patterns in delivery performance and improve accuracy over time.
- Adjust dynamically in real-time by learning from unexpected conditions like traffic congestion and road closures.

GPS and Telematics : GPS and telematics provide real-time tracking and vehicle monitoring, allowing logistics managers to:

- Track fleet movement and optimize routing based on live location data.
- Monitor driver behavior, such as speed, idling time, and route adherence.
- Improve safety and compliance by ensuring drivers follow recommended routes.

Geographic Information Systems (GIS) : GIS technology enables detailed mapping and geospatial analysis, which is essential for route optimization. It helps:

- Map out detailed road networks, including restricted zones and toll roads.
- Provide accurate distance calculations for multi-stop deliveries.
- Integrate weather conditions into routing decisions.

Traffic and Weather Data Integration : Modern route optimization tools integrate real-time traffic and weather data from multiple sources, including:

- Google Maps and local traffic APIs for congestion updates.
- Weather monitoring systems to adjust routes in case of storms, floods, or heavy rainfall.
- AI-driven traffic prediction models to anticipate congestion before it happens.

Cloud Computing and Big Data Analytics : The vast amount of data required for route optimization is processed using cloud-based computing and big data analytics. This allows businesses to:

- Scale operations seamlessly, optimizing thousands of routes at once.
- Access route planning tools from any device, ensuring flexibility.
- Analyze historical data to refine logistics strategies over time.

Internet of Things (IoT) and Smart Sensors : IoT technology enhances route optimization by connecting vehicles, warehouses, and delivery hubs in a smart network. Key benefits include:

- Real-time monitoring of vehicle health (fuel levels, engine status, tire pressure).
- Automated alerts for route deviations, breakdowns, or delays.
- Seamless integration with warehouse management systems to align deliveries with inventory availability.

Gain real-time supply chain intelligence with Freight IQ, track market dynamics, anticipate seasonal shifts, and make data-driven decisions to optimize your freight operations. While logistics route optimization offers many benefits, some challenges need to be addressed for successful implementation. Let's explore the obstacles businesses may face in adopting route optimization.

Challenges in Implementing Route Optimization

While route optimization in logistics offers significant benefits, implementing it comes with several challenges. Businesses must overcome technical, operational, and financial hurdles to ensure a seamless and efficient routing system.

Here are the key challenges faced during route optimization implementation:

1. **High Initial Investment Costs :** Deploying advanced route optimization software requires significant upfront investment in technology, infrastructure, and training. Small and mid-sized businesses may find it difficult to afford AI-powered systems, GPS tracking, and real-time traffic monitoring tools. Costs associated with system integration, software licensing, and regular updates can add to the overall expenditure.

2. **Data Accuracy and Availability :** Route optimization in logistics relies on real-time traffic data, weather conditions, and road restrictions. If this data is inaccurate or outdated, it can lead to inefficient routing decisions. Poorly mapped delivery locations, missing address details, and incorrect geocoding can disrupt the optimization process. In rural and remote areas, a lack of proper mapping and real-time traffic updates can create routing inefficiencies.

3. **Resistance to Change from Drivers and Staff :** Logistics teams and drivers may be reluctant to adopt new technology, preferring traditional routing methods. Resistance to automation may stem from concerns over job security, additional workload, or difficulty in using digital tools. Lack of proper training can result in underutilization of route optimization software, reducing its effectiveness.

4. **Integration with Existing Systems :** Many businesses already use Transportation Management Systems (TMS), Fleet Management Systems (FMS), and Enterprise Resource Planning

(ERP) solutions. Ensuring seamless integration between these systems and route optimization software can be complex. Poor integration can result in data silos, inefficiencies, and compatibility issues that affect decision-making.

5. **Dynamic Nature of Logistics Operations :** Unexpected delays such as traffic congestion, road closures, vehicle breakdowns, and last-minute order changes make real-time route adjustments necessary. Traditional route optimization models struggle to handle real-time rerouting, requiring AI-driven solutions for better adaptability. Handling multi-stop deliveries, different vehicle capacities, and varying delivery windows adds another layer of complexity.

Overcoming these challenges requires a comprehensive approach to freight management that enhances visibility, automates workflows, and optimizes freight movement. FreightFox helps businesses streamline operations with real-time tracking, seamless system integration, and data-driven decision-making, turning logistics complexities into operational efficiencies.

Industry Applications and Use Cases of Route Optimization : Route optimization in logistics is revolutionizing multiple industries by enabling businesses to reduce delivery times, lower costs, and enhance overall efficiency. From e-commerce to healthcare, industries that rely on transportation and logistics are increasingly adopting route optimization to improve their operations.

E-Commerce and Retail Logistics : With the rise of online shopping, efficient delivery management is crucial for e-commerce and retail businesses. Route optimization helps by:

- Ensuring faster last-mile deliveries for same-day and next-day orders.
- Reducing delivery costs by optimizing multi-stop routes for multiple orders.
- Improving customer satisfaction with accurate ETAs and real-time tracking.
- Handling high-volume orders efficiently, especially during peak seasons like Diwali or holiday sales.

Food Delivery and Quick Commerce : Speed is the most critical factor in food delivery and quick commerce (10-minute grocery delivery services). Route optimization benefits this sector by:

- Finding the fastest possible route to ensure food reaches customers hot and fresh.
- Reducing delivery times for perishable items, such as groceries and dairy products.
- Dynamically rerouting drivers based on real-time traffic updates.
- Optimizing multiple deliveries in a single trip to maximize efficiency.

Courier and Parcel Delivery Services : Logistics companies rely on route optimization to streamline deliveries by:

- Managing multiple delivery destinations efficiently to minimize travel distance.
- Automating driver assignments for better workforce utilization.
- Reducing failed deliveries by ensuring accurate route planning.
- Providing real-time tracking for customers and businesses.

Healthcare and Pharmaceutical Logistics : In healthcare, timely delivery of medical supplies, vaccines, and emergency aid is crucial. Route optimization ensures:

- Faster dispatch of ambulances and emergency response vehicles.
- Efficient supply chain management for hospitals and pharmacies.
- Optimized cold chain logistics for temperature-sensitive medicines and vaccines.
- On-time delivery of medical equipment to clinics and hospitals.

Field Service Management : Companies providing repair, installation, and maintenance services benefit from optimized route planning by:

- Reducing travel time between service locations allows technicians to complete more jobs per day.
- Ensuring prompt responses to urgent repair requests.
- Optimizing work schedules based on technician availability and location.

Conclusion

Route optimization isn't just about cutting costs, it's about smarter logistics, faster deliveries, and happier customers. By using AI-driven algorithms, real-time data, and intelligent routing, businesses can minimize delays, maximize fleet productivity, and streamline operations. Optimized routing also reduces fuel consumption and emissions, making logistics both cost-effective and sustainable.

Source: www.freightfox.ai

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UNION BUDGET 2026–27: BLUEPRINT FOR VIKSIT BHARAT 2047

Union Minister Nirmala Sitharaman tabled the Union Budget 2026-27 focusing on accelerating growth, building citizen capacity, and ensuring inclusive resource access for all.

The Union Budget 2026–27, presented by Finance Minister Nirmala Sitharaman on February 1, 2026, represents a key fiscal intervention following the assessment laid out in the Economic Survey. Prepared for the first time in Kartavya Bhawan, the budget outlines the government's economic priorities amid global uncertainty and domestic growth imperatives.

With total expenditure estimated at 53.5 lakh crore and a fiscal deficit estimated at 4.3% of GDP, the budget seeks to sustain GDP growth while adhering to fiscal discipline. It reflects the Indian government's effort to balance public investment, social spending, and macroeconomic stability.

The budget is anchored around three kartavyas: accelerating economic growth, building human capacity, and ensuring inclusive development. These pillars align with the broader objective of transforming India into a developed economy by 2047.

First Kartavya: Accelerating and Sustaining Economic Growth

The first kartavya focuses on maintaining growth momentum by strengthening productivity, manufacturing capacity, and infrastructure. This approach echoes the Economic Survey's emphasis on capital formation and competitiveness as central to sustaining long-term growth.

A key initiative is Biopharma SHAKTI, with an allocation of 10,000 crore over five years. The programme aims to expand India's pharmaceutical and biopharma capabilities by improving research infrastructure, expanding clinical trial capacity, and strengthening institutional support. The proposal includes setting up three new National Institutes of Pharmaceutical Education and Research and upgrading seven existing institutes to address skill and research gaps.

The semiconductor ecosystem receives renewed policy support through the India Semiconductor Mission 2.0. In parallel, the Electronics Components Manufacturing Scheme has been expanded to 40,000 crore to encourage domestic value addition. The budget also proposes Rare Earth Corridors in Odisha, Kerala, Andhra Pradesh, and Tamil Nadu to strengthen access to critical minerals required for electronics, renewable energy, and advanced manufacturing.

The textile sector is addressed through an integrated programme combining the National Fibre Scheme, the Textile Expansion and Employment Scheme, and targeted support for khadi, handloom, and handicrafts. The objective is to improve scale, productivity, and employment outcomes in a sector that continues to support a large workforce.

Infrastructure Development at Scale

Public capital expenditure (capex) has been increased to 12.2 lakh crore in FY 2026–27 from 11.2 lakh crore in the previous year. This sustained emphasis on infrastructure investment reflects the government's view of capex as a growth multiplier, a theme consistently highlighted in the Economic Survey.

Seven high-speed rail corridors have been announced to connect major economic and urban centres, including Mumbai–Pune, Pune–Hyderabad, Hyderabad–Bengaluru, Hyderabad–Chennai, Chennai–Bengaluru, Delhi–Varanasi, and Varanasi–Siliguri. These corridors are expected to reduce travel time, improve regional connectivity, and support economic integration.

Creating Champion MSMEs

The budget recognises Micro, Small and Medium Enterprises (MSMEs) as a major source of employment, exports, and regional development. A 10,000 crore SME Growth Fund has been announced to support scaling up of high-performing enterprises. In addition, the Self-Reliant India Fund receives an additional 2,000 crore to ensure continued access to risk capital for micro enterprises.

To address structural constraints, a scheme has been announced to revive 200 legacy industrial clusters through infrastructure upgradation and technology support. These measures aim to improve cost competitiveness and productivity, in line with the Economic Survey's assessment that MSME performance is critical for sustained GDP growth.

Second Kartavya: Fulfilling Aspirations and Building Human Capacity

The second kartavya focuses on strengthening human capital through investments in healthcare, education, and skill development. The budget proposes the

establishment of five Regional Medical Hubs to position India as a destination for medical services. Over five years, 1 lakh Allied Health Professionals are expected to be added to the workforce. Three new All India Institutes of Ayurveda are proposed to strengthen traditional medicine systems.

In education, five University Townships are planned near major industrial and logistics corridors to improve linkages between academia and industry. To address accommodation gaps for women in higher education, one girls' hostel will be established in every district through viability gap funding or capital support.

The creative economy, also called 'Orange economy', will be supported through setting up Animation Visual Effects Gaming and Comics (AVGC) Content Creator Labs in schools and colleges. Supported by the Indian Institute of Creative Technologies, Mumbai, it will aid the development of the emerging digital and creative industries.

Tourism and Sports Development

Tourism development is positioned as a driver of employment and regional growth. The National Council for Hotel Management and Catering Technology will be upgraded into a National Institute of Hospitality. A pilot scheme will train 10,000 tourist guides across 20 destinations using a standardised 12-week curriculum.

Fifteen archaeological and heritage sites, including Lothal, Dholavira, Rakhigarhi, and Leh Palace, will be developed with improved visitor infrastructure and conservation measures. The Khelo India Mission aims to strengthen sports infrastructure, talent identification, and coaching systems over the next decade.

Third Kartavya: Inclusive Development

The third kartavya focuses on inclusive development aligned with Sabka Saath, Sabka Vikas. In agriculture, Bharat-VISTAAR (Virtually Integrated System to Access Agricultural Resources), an AI-based multilingual advisory platform, will integrate AgriStack databases with ICAR practices to provide farm-level decision support.

The budget proposes integrated development of 500 reservoirs and Amrit Sarovars to improve water security. Special attention is given to the North-Eastern states. An East Coast Industrial Corridor with a node at Durgapur is planned, along with the development of five tourism destinations and deployment of 4,000 e-buses. A Buddhist Circuit covering several North-Eastern states will focus on heritage conservation, connectivity, and pilgrim facilities.

Under Mental healthcare, National Institute of Mental Health and Neurosciences (NIMHANS-2) will be established in north India, while mental health institutes in Ranchi and Tezpur will be upgraded as regional apex centres.

Tax Reforms and Ease of Doing Business

The New Income Tax Act, 2025, effective from April 2026, aims to simplify tax compliance through simpler rules, redesigned forms, and easier procedures. The Tax Collected at Source (TCS) rate on overseas tour packages and on remittances under the Liberalised Remittance Scheme for education and medical purposes have been lowered to 2%.

For the IT sector, software development, IT-enabled services, and contract R&D services have been merged into a single category of Information Technology Services with a common safe harbour margin of 15.5%.

The eligibility threshold has been raised to 2,000 crore, and safe harbour approvals will follow an automated process. Foreign cloud service providers using Indian data centres will receive a tax holiday until 2047, strengthening India's ease of doing business and global competitiveness. To reduce compliance burden, a Joint Committee of the Ministry of Corporate Affairs and CBDT will align Income Computation and Disclosure Standards (ICDS) with Indian Accounting Standards (IndAS), removing the need for separate tax accounting from 2027–28.

In indirect taxes, customs duty on personal imports has been reduced to 10%. Duties on 17 medicines have been exempted, and seven additional rare diseases have been included for duty-free imports.

Customs and Trade Facilitation

Cargo clearance approvals from multiple agencies will be integrated through a single digital window by the end of the financial year. The Customs Integrated System will be rolled out over two years as a unified platform for customs processes.

The removal of the 10 lakh value cap on courier exports is expected to benefit small businesses and artisans engaged in e-commerce. Fish caught by Indian vessels in the Exclusive Economic Zone will be duty-free, with landings at foreign ports treated as exports.

Conclusion

The Union Budget 2026–27, read alongside the Economic Survey, outlines a structured approach to growth, inclusion, and fiscal consolidation. Its focus on manufacturing, infrastructure, MSMEs, and human capital addresses both immediate economic needs and long-term structural priorities. The three-kartavya framework offers a useful lens to understand evolving policy direction.

Source: visionias.in

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UNION BUDGET 2026–27: BUILDING INDIA AS A GLOBAL MANUFACTURING AND SERVICES HUB

Union Budget 2026–27 strengthens India's position as a preferred "China-plus-one" destination. The measures focus on tax certainty, supply-chain resilience and ease of doing business across manufacturing, GCCs and export-driven sectors.

India's Union Budget 2026-27 clearly tries to make India a long?term base for global manufacturing and services, while keeping tax and customs rules simpler and more predictable for both Indian and foreign businesses.

The Budget is built around three main ideas:

- keep the economy growing with more investment and jobs,
- help people build skills and incomes, and
- ensure growth is inclusive across regions and sectors.

For businesses, it opens clear opportunities in cloud and IT, contract manufacturing, global capacity centres, seafood, textiles, aerospace, defence, and MSME driven supply chains.

Tax holiday and foreigner-friendly measures : This Budget is very friendly to foreign companies that want to base real business in India:

- Foreign companies providing cloud services to global customers using data centre infrastructure in India get a tax holiday up to 2047, which in practice is a very long-term tax break for global capacity centres and cloud platforms.
- Any non-resident that provides capital goods, equipment or tooling to a toll manufacturer in a bonded zone will get a five year income tax exemption on that income, which suits contract manufacturing models where equipment is owned offshore and used in India.
- Non-resident experts get exemption on their global (non-India sourced) income for a stay of up to five years under notified schemes, making it easier to post foreign managers and technical specialists into India.
- Non-residents who are taxed on a presumptive basis will not be subject to Minimum Alternate Tax (MAT), which simplifies tax for many foreign structures.

In simple terms, if a foreign group wants to move part of its China-based work to India—cloud, design, back office or manufacturing—this Budget reduces tax friction both for the foreign entity and for its key people.

MSMEs, contract manufacturing and "China plus one"

The Budget strengthens the MSME ecosystem so that it can support large global supply chains:

- A Rs.10,000 crore SME Growth Fund will invest in promising MSMEs so that some of them can grow into mid and large-sized "champion" suppliers.
- The Self Reliant India Fund gets an extra Rs.2,000 crore, keeping risk capital flowing to small businesses, including those working as contract manufacturers.
- TReDS is being pushed as the main payment and discounting platform for MSME invoices to CPSEs, backed by credit guarantees and even securitisation of receivables, which improves cash flow for vendors.
- Professional bodies like ICAI, ICSI and ICMAI will create "Corporate Mitras" to help MSMEs handle compliance at lower cost, which is important when they supply to foreign clients with strict governance standards.

For foreign clients shifting sourcing from China, this means Indian MSMEs will be better capitalised, more compliant, and easier to work with on long-term contract manufacturing and component supply arrangements.

Sector focus: seafood, textiles, aerospace and defence

Seafood and agri-exports

- The limit for duty free imports of specified inputs for seafood processing has been raised from 1% to 3% of the previous year's FOB export value, directly improving margins for export oriented seafood units.
- Fish caught by Indian vessels in the EEZ or on the high seas will be free of duty, and landing such fish at a foreign port will be treated as an export of goods, giving more flexibility in structuring international seafood routes and joint ventures.

This creates a strong base for foreign seafood brands and trading houses to use India as a processing and export hub.

Textiles, leather and other labour intensive exports

- An Integrated Programme for the Textile Sector includes a National Fibre Scheme, a Textile Expansion and Employment Scheme for cluster modernisation, and Mega Textile Parks focused on technical textiles.
- Duty free import benefits for inputs are extended to shoe uppers, and the export period for leather and textile garments and footwear is extended from six months to one year, which helps exporters manage production and logistics cycles better.

These steps make India more attractive for global buyers in apparel, leather and technical textiles who want to reduce over-dependence on China and Southeast Asia.

Aerospace and defence manufacturing

- Basic customs duty is exempt on components and parts used in aircraft manufacturing, and on raw materials imported for manufacturing aircraft parts used in MRO activities for defence units.
- A special one-time measure allows eligible SEZ manufacturers to sell into the Domestic Tariff Area at concessional duty up to a prescribed limit, which is important for aerospace and defence units set up in SEZs.

Foreign OEMs in civil aviation and defence can now look at India not only as a market, but also as a production and MRO base with lower input costs.

Global capacity centres (GCCs), IT and data-led businesses

The Budget tries to lock in India's advantage as a service and technology hub:

- Software development, ITES, KPO and contract R&D related to software are all clubbed into a single "Information Technology Services" category, with a common safe-harbour margin of 15.5% and a higher turnover threshold of Rs.2,000 crore, which brings more certainty in transfer pricing for large GCCs.
- Safe-harbour approvals will be automated and can continue for five years at a time, and unilateral APAs for IT services are to be fast-tracked with a normal target of two years, extendable by six months at the taxpayer's request.
- The tax holiday for foreign cloud service providers using Indian data centres, plus a 15% safe-harbour margin for related Indian data-centre entities, makes India a very attractive place to house global workloads and data-heavy operations.

For companies currently running critical IT and back office work from China or other jurisdictions, this combination of tax certainty, safe-harbour margins and cloud tax holidays makes India a natural "plus-one" location.

Ease of doing business and tax compliance

Apart from sector-specific incentives, the Budget also makes day-to-day tax and compliance easier:

- Individuals resident outside India (PROIs) will be allowed to invest in listed Indian shares through the Portfolio Investment Scheme, giving them a simpler route into Indian equity markets.
- TCS on overseas tour packages is being reduced to 2%, and TCS on LRS remittances for education and medical purposes is also being cut to 2%, which lowers upfront cash outflow for families and small businesses.
- TDS on supply of manpower services will be at only 1% or 2%, and small taxpayers can obtain lower or nil TDS deduction certificates through a rule based automated process.
- Depositories will be able to accept Forms 15G/15H even where taxpayers hold securities in multiple companies, and the time for revising returns is extended from 31 December to 31 March, subject to a nominal fee.
- Taxpayers can update their returns even after reassessment proceedings have begun, by paying an additional 10% over the normal tax rate, which helps in closing disputes with less litigation.
- A one-time six month foreign asset disclosure scheme is proposed for smaller cases, and immunity from prosecution is given for past non-disclosure of certain foreign assets up to Rs.20 lakh (excluding immovable property), with effect from 1 October 2024.
- Non-residents who pay tax on a presumptive basis are exempt from MAT, MAT credit set-off in the new regime is capped at one-fourth of the tax liability, and MAT is proposed to become a final tax going forward.

These changes support cross-border investors, NRIs and small businesses by reducing cash flow strain, simplifying procedures and offering cleaner ways to settle old issues.

Customs, ease of trade and "trusted trader" approach

- Customs duty is removed on several key inputs: aircraft components and raw materials for defence MRO parts, capital goods for processing critical minerals, parts for microwave ovens, capital goods for lithium-ion cell manufacture, and certain inputs

for solar glass.

- Duty free sales from SEZs into the domestic market at concessional duty for a one-time window will help units balance exports and domestic demand.
- Tier 2 and Tier 3 Authorised Economic Operators get a longer duty deferral period (from 15 to 30 days), advance rulings will be valid for five years instead of three, and trusted importers with strong track records will face less frequent verification and more warehouse operator centric rules.
- Cargo clearance approvals from different agencies are to be processed through a single interconnected digital window, and a new Customs Integrated System is planned to be rolled out in two years.

This "trust based" framework suits large global businesses that value predictable and quick customs handling for high-value, just-in-time supply chains.

How India Law Offices (ILO) can assist

India Law Offices can help foreign investors, NRIs, global companies and Indian promoters turn these Budget changes into practical business structures that actually work on the ground.

- **Business and tax setup:** We help you choose the right form of presence in India (subsidiary, LLP, branch or liaison office). We can also design cloud, data centre and contract manufacturing models so that you can use the new tax holidays and safe-harbour rules and keep them aligned with the upcoming Income tax Act, 2025.
- **MSME and vendor ecosystem:** Drafting and vetting contract-manufacturing, supply and quality control agreements with Indian MSMEs, including risk allocation, IP protection and export control compliance.
- **Customs and indirect tax support:** We can plan your seafood, textile, aerospace and defence supply chains so that you make full use of duty free imports, SEZ to DTA concessions and bonded warehouses or EEZ based models, while staying fully compliant with Indian law.
- **Regulatory and FEMA compliance:** We advise on foreign investment rules, bonded zone and SEZ operations, movement of money in and out of India, and technology or know-how sharing. This is especially useful for companies shifting part of their production or services from China to India and wanting a clean, compliant structure from day one.

Source: www.indialawoffices.com

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UNION BUDGET 2026–27: EXPORTS TAKE CENTRE STAGE AS BUDGET PUSHES JOBS, MANUFACTURING AND GLOBAL VALUE CHAINS

Semiconductors to Biopharma, Electronics, Textiles, Budget Scales Manufacturing Across Strategic and Labour-Intensive Sectors

SEZ Reforms Aim to Boost Capacity, Scale and Global Investor Interest While Preserving Export Focus

SEZ Reforms Coupled with Freight, Waterway and Logistics Push to Cut Export Costs

Budget Unveils 10,000 Crore SME Growth Fund to Ease Credit and Boost MSME Exports

The Union Budget 2026–27 places international trade and exports at the heart of India's growth strategy, reaffirming the Government's commitment to building a competitive, resilient, and globally integrated economy. Anchored in macroeconomic stability, fiscal discipline, and sustained public investment, the Budget advances a comprehensive reform and investment agenda aimed at strengthening India's position as a trusted global trading partner and accelerating progress towards the vision of Viksit Bharat.

Recognising exports as a critical driver of employment, industrial upgrading, foreign exchange earnings, and global value chain integration, the Budget announces a wide range of measures spanning the services sector, manufacturing, Special Economic Zones (SEZs), infrastructure, ease of doing business, and sector-specific reforms.

A major highlight of the Budget is its sharp focus on scaling domestic manufacturing in strategic and labour-

intensive sectors, thereby strengthening export competitiveness and reducing critical import dependence. Flagship initiatives include Biopharma SHAKTI, the launch of India Semiconductor Mission 2.0, expansion of the Electronics Components Manufacturing Scheme, development of Rare Earth Corridors, establishment of Chemical Parks, and targeted support for capital goods and container manufacturing.

Labour-intensive sectors such as textiles, footwear, sports goods, handicrafts, and handlooms receive renewed attention through integrated parks, modernisation schemes, skilling initiatives, cluster rejuvenation, and sustainability-focused programmes. The revival of 200 legacy industrial clusters through infrastructure and technology upgradation will help lower costs, improve productivity, and make traditional export hubs more competitive.

The gems and jewellery sector, one of India's largest foreign exchange earners, stands to benefit significantly from indirect measures aimed at trade facilitation and logistics efficiency. Removal of the 10 lakh value cap on courier exports will support small exporters and e-commerce-led shipments, while improvements in handling of returned consignments will reduce friction in global B2C trade. Extensions of concessional customs duty regimes for gold and silver dore bars and lab-grown diamond inputs will further support domestic refining and value addition.

The services sector receives a strong policy thrust. A High-Powered Education-to-Empowerment and Enterprise Standing Committee has been proposed to guide coordinated reforms and position India as a global leader in services, with an aspirational target of a 10 per cent share in global services exports by 2047. Targeted tax and regulatory reforms for IT and IT-enabled services—such as a unified classification of IT services, higher safe-harbour thresholds, automated approvals, faster Advance Pricing Agreements, and long-term certainty—will enhance India's attractiveness for Global Capability Centres (GCCs) and international service providers.

The Budget also proposes tax holidays up to 2047 for foreign companies providing global cloud services through India-based data centres, along with safe-harbour norms for related-party services. These measures are expected to accelerate foreign investment, deepen digital infrastructure, and establish India as a global hub for digital and data-driven services.

Reforms in Special Economic Zones are designed to enhance capacity utilisation, economies of scale, and overall resilience of the SEZ ecosystem while maintaining export orientation. One-time facilitation for limited Domestic Tariff Area sales at concessional duties and extended tax incentives for cloud and data-centre operations are expected to attract global manufacturers and technology players to SEZs.

A powerful push for infrastructure development underpins the export strategy. Increased public capital expenditure, expansion of Dedicated Freight Corridors, new National Waterways, coastal shipping promotion, container manufacturing, logistics parks, and high-speed rail corridors will significantly reduce logistics costs and improve connectivity, particularly for tier-2 and tier-3 cities. These investments will directly enhance export competitiveness by reducing dwell times and improving supply-chain efficiency.

The Budget advances a trust-based, technology-driven approach to ease of doing business in trade. Key measures include electronic sealing of export cargo, trusted supply-chain recognition, automated customs processes, expansion of non-intrusive scanning, longer validity of advance rulings, enhanced duty deferment for Authorised Economic Operators, and removal of value caps for courier exports. Together, these reforms will improve predictability, reduce transaction costs, and strengthen India's standing on global trade facilitation indices.

MSMEs—India's export backbone—receive focused support through a 10,000 crore SME Growth Fund, enhanced credit guarantee mechanisms, mandatory use of TReDS by CPSEs, and integration of GeM with TReDS to improve access to timely and affordable finance. These measures directly address working-capital constraints and enable MSMEs to scale in global markets.

Sector-specific initiatives in agriculture, marine products, pharmaceuticals, tourism, AVGC, and allied health services open new export opportunities and reinforce India's diversified export base.

Overall, Union Budget 2026–27 presents a coherent and forward-looking trade and export strategy—one that combines competitive manufacturing, services excellence, logistics modernisation, regulatory simplification, and infrastructure investment. It reinforces India's role as a reliable global partner and lays a strong foundation for sustained export growth, job creation, and long-term economic resilience.

Source: PIB

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GS1'S NEW RFID STANDARD MAKES SUPPLY CHAIN DATA WEB-NATIVE

JIM FRAZER

GS1 has released an update to its RFID Tag Data Standard that addresses a long-standing and practical problem in supply chain visibility: how physical items reliably connect to authoritative digital data. The new release, **RFID Tag Data Standard (TDS) 2.3**, allows RFID tags to carry a web-resolvable domain name alongside an identifier. When scanned, the tag can resolve directly to a URL tied to a specific product, case, pallet, or logistics unit.

At a technical level, TDS 2.3 introduces new Electronic Product Code (EPC) encoding schemes that support embedding domain name information directly in the RFID tag. Instead of returning only an ID that must be reconciled across systems, a read can now point straight to a live data source. That source might be an enterprise platform, a cloud service, or a supplier-managed endpoint containing current, authoritative information about the item.

Operationally, this changes how RFID data is accessed and shared. One of the persistent challenges in multi-party supply chains has not been data scarcity, but uncertainty about where data lives and how to reference it consistently across organizations. By making RFID identifiers web-native, TDS 2.3 removes much of that ambiguity. Logistics units such as pallets and cases can effectively "phone home," enabling systems and partners to retrieve data without custom lookup tables or brittle integrations.

The most immediate value shows up at the logistics-unit level rather than at the individual product level. Pallets, containers, and cases are where aggregation, handoffs, and risk concentrate, and where clearer data paths produce faster returns. Operators spend less time reconciling identifiers across TMS, WMS, ERP, and partner systems, and more time acting on reliable information. The result is faster exception handling, cleaner handoffs, and better use of RFID data that many organizations already collect but struggle to operationalize.

The update also strengthens traceability in the context of cargo theft and organized retail crime. With theft rates continuing to rise, serialized RFID data that resolves directly to an authoritative source makes it easier to track goods through the supply chain and identify recovered items. When stolen goods are found, origin and ownership can be established more quickly, reducing administrative friction for retailers and law enforcement. This doesn't eliminate theft, but it lowers the cost and complexity of recovery.

Industry impact will vary. Pharmaceuticals already operate under strict traceability regimes, so the change is evolutionary there. Apparel, general merchandise, and food are likely to see a more meaningful step forward, particularly as traceability and transparency requirements continue to expand. Importantly, the benefits are not limited to large enterprises. By reducing integration complexity, TDS 2.3 makes RFID data more usable for smaller firms as well, improving arrival-time visibility, reducing theft exposure, and potentially lowering insurance friction.

The original catalyst for web-enabled RFID was the European Union's Digital Product Passport regulation, which focuses on product-level transparency. While that regulation set the direction, the logistics-unit use case has emerged as the more immediate operational payoff. The standard extends RFID beyond identification and into discoverability, clarifying where data lives and how it can be retrieved across systems and partners.

For suppliers and shippers, this also shifts the data-sharing model. With TDS 2.3, a supplier can expose a single authoritative endpoint for certifications, provenance data, handling instructions, or serialization details. Rather than pushing static data to every trading partner, suppliers make data discoverable when it's needed. That reduces duplication, clarifies ownership, and simplifies dispute resolution across complex distribution networks.

TDS 2.3 does not require new hardware or a new platform. It makes existing RFID deployments more interoperable with modern web and enterprise architectures. By turning RFID identifiers into web-resolvable references, GS1 is addressing a quiet but persistent barrier to supply chain visibility. The payoff isn't flashy automation, it's clearer data paths, lower integration friction, and better alignment between physical flows and digital systems.

Source: logisticsviewpoints.com

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INDIA'S TRADE STRATEGY FOR THE 21ST CENTURY: TARIFFS, SUPPLY-CHAINS, INVESTMENT AND TECHNOLOGY

DR. PRITAM BANERJEE, PROFESSOR & HEAD, CENTRE FOR WTO STUDIES, INDIAN INSTITUTE OF FOREIGN TRADE

Introduction: Trade Policy in the Context of the Vision for Viksit Bharat : India has set itself an ambitious target. The country hopes to transform into a developed economy with commensurate per capita income and quality of life by 2047. This vision of Viksit Bharat envisages a robust economy that is globally competitive and integrated into global value chains, generating economic opportunities for Indian workers and businesses to assist in fulfilling this transformation into a developed economy. Integral to this vision is a diversified and technologically advanced industrial sector that serves as an engine of growth and employment creation and a means to meet India's security needs, reinforcing India's emergence as a global power.

Achieving this goal would require sustained economic growth of at least 8% for well over a decade. However, such growth would also need to produce relatively well-paying jobs capable of absorbing the millions of working-age Indians. With around 990 million people in its working-age population, India currently boasts the world's largest cohort of potential workers. This presents both a challenge and an opportunity. If this population is productively employed, it will create a virtuous cycle of production leading to income and demand that will aid India in achieving its target of Viksit Bharat. Generating such productive employment would necessitate a rapid expansion of the manufacturing and services sectors, allowing India to leverage demand drivers in both the domestic and global economies. Consequently, India's trade and investment strategies are central to its path towards Viksit Bharat.

However, this growth path is complicated by the increasingly rapid adoption of automation and robotics in manufacturing, along with AI-led solutions in services. East Asian economies, including China, relied on relatively low labour costs, supported by decent infrastructure and political stability, to attract the labour-intensive segments of the manufacturing value chain to their countries during their industrial transformation from the 1980s to the early 2000s. Indian workers will now have to compete not only with workers from other countries in terms of productivity and cost, but also with robots and AI-led automation in skilled jobs.

Autor (2019) presents evidence of a highly polarised labour market due to such technological shocks, with high returns for the highly skilled and increasingly lower returns and opportunities for less skilled workers. This indicates a shrinking number of 'middle-class' jobs precisely when India would want millions of its low-wage workers to transition towards better-paying middle-class jobs to drive its economic development. Giuntella et al. (2022) show that China is already facing a challenge from the adoption of robotics despite the scale and depth of its manufacturing sector. The increasing use of robots to enhance productivity and reduce costs diminishes economic opportunities for less-skilled workers in China. Acemoglu and Restrepo (2020) have shown that the growing use of robots reduces wages and employment, while Christiansen and Winkler (2019), using the trade flows between the US and Mexico as an example, provide evidence that increasing automation in developed country industries has reduced export opportunities for developing countries.

India would have to contend with this challenging technology transition and what many economists have termed the 'China Shock'. China's economy and manufacturing exports have grown at an unprecedented rate over the past three decades since the 1990s. As Table 1 below shows, China's share of global manufacturing output increased 11.5 times from just 2.5% in 1990 to 28.7% in 2020. Currently, China accounts for close to one-third of global manufacturing output. No other single economy has dominated global manufacturing as China's does today. China's global share of manufacturing exports increased marginally from 1.5% to 1.8% between 1990 and 2000. However, it increased exponentially post-2000 after China became a member of the World Trade Organisation (WTO), reaching 14% by 2023.

Table 1: Share of Global Manufacturing Output

Countries /Region	1980	1990	2000	2010	2020
China	3.70%	2.50%	6.40%	18.20%	28.70%
Germany	9.00%	9.50%	6.70%	6.30%	5.40%
India	1.10%	1.20%	1.20%	2.70%	2.80%
Japan	11.00%	17.90%	18.60%	11.30%	7.50%
Korea, Republic of	0.50%	1.50%	2.50%	3.00%	3.00%
South-eastern Asia	1.30%	1.80%	2.70%	4.40%	4.90%

Source: Author's calculation based on UNCTAD Data

China has not only come to dominate labour-intensive manufacturing exports (global share rising from 11% to 32% between 2000 and 2022), but also high-tech manufacturing exports (global share rising from just 4.5% to 25.6% between 2000 and 2022), as illustrated in Figure 1 below.

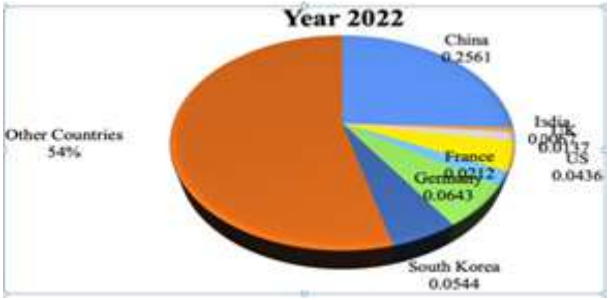
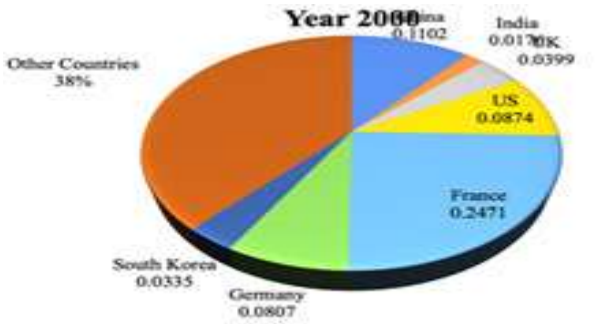
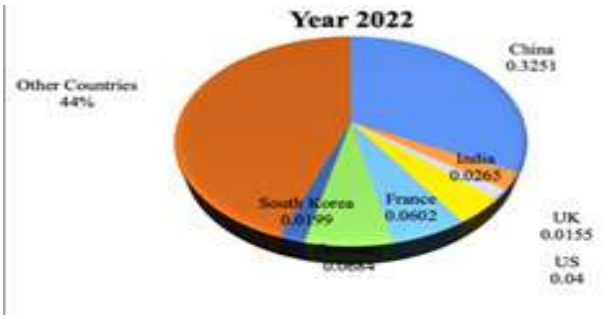


Figure 1: Global Share of Manufacturing Exports

High-tech Products

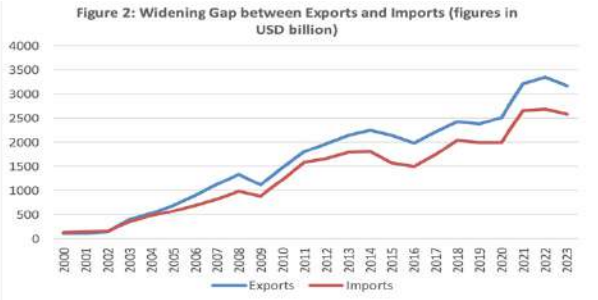




Labour Intensive Products

Source: Authors' calculations based on World Integrated Trade Solutions (WITS) UN COMTRADE

The impact of this rapid and unprecedented rise has been further exacerbated by the fact that China has largely followed a mercantilist approach, encouraging exports and production while limiting consumption and imports. This gap between China's exports and imports has been widening since the early 2000s (see figure 2 below). It is important to note that China's share of global exports has not increased since 2016 and has remained stable at around 13% to 14%. This stagnation is partially attributable to tariff protections targeting Chinese imports implemented during the first Trump administration and protectionist measures in the EU and several other Asian countries. Nevertheless, China's share of global manufacturing output has continued to grow, supported by state assistance, thereby increasing the risk of creating global overcapacity across various sectors[1].



Source: Authors' calculations-based World Development Indicators Database, World Bank

This unprecedented and unbalanced growth of China's manufacturing sector and its domination of manufacturing exports have resulted in severe economic distress and job losses. Caliendo et al. (2019) and Autor et al. (2013) provide evidence of such significant job reductions due to this so-called 'China Shock'. A Rhodium Group report from 2024 emphasises that developing countries have been particularly adversely affected by China's mercantilist policies[2].

The western world, particularly the United States, facilitated the entry of China, a non-democratic polity and a non-market economy, into the rules-based trading architecture of the global economy as represented by the WTO in 2000, with the hope that increasing integration with the global economy and rising incomes would lead to a democratic transition. It is clear that developments in China are actually moving in the opposite direction. As long as China's unfair trade practices predominantly affected labour-intensive industries, with the adverse effects primarily felt by developing countries like India, the Western nations (and Japan) showed little concern (Banerjee et al. 2025a). In fact, many Western economists argued that Chinese subsidies helped manage inflation in their countries and that cheaper Chinese industrial parts and components enhanced the competitiveness of Western industries[3].

However, as China began to challenge the dominance of Western economies in their core tech-intensive sectors, Western countries started to push back with more protectionist policies and state support for their own industries, often in contravention of the global rules they themselves championed a few decades ago. The tariff policies under the Trump administration and industrial policies such as the Inflation Reduction Act (IRA) and the CHIPS Act under the Biden administration are examples of such trade-distorting policies. The EU has been actively using environmental policies, such as the Carbon Border Adjustment Measures or CBAM, as a guise for protectionism. This Western reaction to the global imbalance caused by China is also shrinking the global opportunities available to large developing countries like India, precisely at a time when it needs to leverage such opportunities the most.

Another major concern arising from China's domination of global manufacturing and exports is the vulnerabilities created for global supply chains due to over-reliance on China (or any single country). China has a 65% or greater share of imports in 407 products

that are critically important, as they are associated with national security, healthcare, agriculture (fertilisers), renewable energy, or represent key intermediate inputs to industry[4]. Such dependence can be easily weaponised by China, as demonstrated by the recent instance of China withholding the export of key capital machinery to slow down the shift of smartphone manufacturing to India[5], or export controls of industrial magnets[6] that have widespread industrial application including in the automobile industry, are perfect examples of such weaponisation of supply-chains.

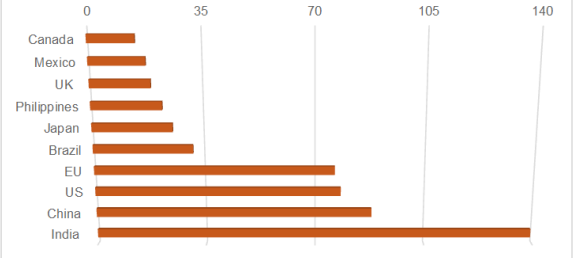
China has also employed predatory pricing to eliminate any domestic capacity a country has, thereby increasing dependence on Chinese imports. In India, this was evident in the case of several chemicals that are Active Pharmaceutical Ingredients (APIs) critical to India's pharmaceutical industry. Consequently, reducing dependence, particularly on unreliable trade partners whose geopolitical interests do not align with India, assumes significant importance.

Indian trade and investment policy must account for and address these fundamental challenges. India needs to establish trade deals that ensure assured access to key markets and eliminate both tariff and non-tariff barriers to its exports. Such assured market access would attract FDI and enable India to leverage global opportunities to drive its economic growth. However, making such deals requires reducing its own tariff barriers. India must negotiate optimal pathways for tariff liberalisation that allow it to provide strategic short- to medium-term protection to key industrial sectors, enabling them to grow while also safeguarding vulnerable sectors of its economy. Furthermore, India must ensure that it is perceived as a trusted partner and is not denied essential technologies.

Another priority would be to address unfair trade practices, particularly those originating from non-market economies. Simultaneously, India would need to advocate for flexibilities in global rules on industrial policy, allowing it to implement strategies that foster manufacturing growth and lift the majority of its population out of poverty and into the middle class. This would require persuading its main economic partners of the necessity for such flexibilities to pursue industrial policies that are intelligent, targeted, and effective, while not being entirely consistent with WTO rules on subsidies and state support for industries.

Another key policy objective would be to further enhance India's competitive advantage in high-skilled services. Increasing digitalisation is amplifying the scale and scope of services trade. As Indian skilled workers bring an increasing level of competition to workers in developed countries across various occupations, there will be mounting pressure on the governments of those countries to protect their workers from such Indian competition. India will need to pre-empt this protectionism and ensure that the economic benefits of services trade, which could generate millions of well-paid jobs and help create an urban middle-class revolution several times the scale of that generated by IT-led development in the 2000s, are not hampered by such protectionist pressures (Banerjee et al. 2025b). As figure 3 below shows, India boasts the world's largest cohort of college-educated individuals. Effectively leveraging this talent will be a critical aspect of India's successful transformation into a developed economy.

Figure 3: College Educated Population, Millions



Source: Global Tech Talent Guidebook 2025, CBRE Research

The following sections will discuss trade policy in relation to specific goals such as ensuring market access for Indian exports, attracting investment, and enhancing technology accessibility for Indian firms. We will also examine the role of bilateral agreements in fostering more resilient supply chains.

Trade Agreements and Market Access : Sustained growth of Indian manufacturing and services will require leveraging both domestic and global opportunities. Ensuring assured market access to the world's major economies and growth regions is, therefore, a critical priority for Indian policymakers. India already has FTAs in place with Japan, Korea, ASEAN, the European Free Trade Area (EFTA), and the UK[7]. It is currently pursuing FTAs with nearly all the other major industrial economies, including Australia[8], the European Union (EU), and the USA[9].

Having negotiated an FTA with the UAE. India is actively considering initiating agreements with the other Gulf Co-operation Council (GCC) member states, including Saudi Arabia[10]. India is engaged in discussions with Russia and other member states of the Eurasian Economic Union (EaEU) for an FTA. Additionally, India is actively pursuing negotiations with major economies in Africa and Latin America for FTAs. The overarching objective is to establish FTAS with all G20 economies, excluding China, by 2030, as well as with the key emerging regions in Africa and Latin America.

According to WTO rules, India's so-called MFN tariffs are available to all WTO member states, including non-market trade distorters like China. Therefore, India cannot discriminate and impose higher tariffs on non-market economies while applying lower tariffs on others. However, India can offer reduced tariffs without violating WTO rules to all countries or regions with which it has negotiated an FTA. India should aim to negotiate and finalise such FTAs with all major economies and trade partners by 2030. These FTA partners would account for a significant portion of global trade covered by FTAs[11]. As Figures 4a and 4b below demonstrate, India's FTA strategy would integrate the country with economies representing two-thirds of global GDP and more than two-thirds of global import demand. Consequently, India's MFN

tariffs would effectively apply only to China and other non-market economies with which India has not negotiated FTAs.

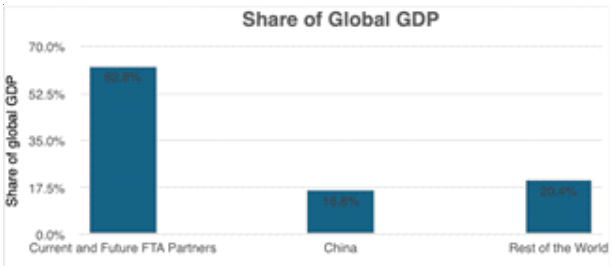


Figure 4a

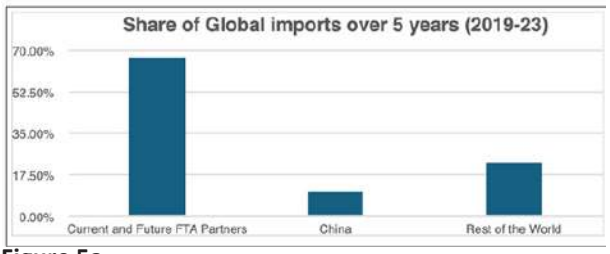


Figure 5a

Source: Calculations based on World Integrated Trade Solution (WITS)

Strategically, this would provide India with the policy space to achieve two important objectives. First, increase such MFN tariffs as high as possible to counter non-market trade-distorting actions by non-market economies while ensuring they do not impact trade with other major market economies, which will be covered by much lower FTA tariffs. Second, use such high MFN tariffs strategically to reduce import dependence and supply-chain vulnerability, and 'friendshore[12]' supplies from preferred FTA partners.

India's FTA strategy aligns completely with the vision of Atmanirbhar Bharat. Thus far, India has largely succeeded in excluding certain sectors from market liberalisation or securing considerably long transition periods before opening its markets to key strategic sectors that are integral to its long-term industrial policy strategy[13] (which we discuss subsequently). This will provide some breathing space before such sectors are exposed to foreign competition as tariffs decrease. India will need to leverage its domestic market size and enhance scale and competence in these crucial sectors that are set to dominate the global economy in the future.

Non-tariff barriers related to product standards, national security, consumer safety, health, and the environment are becoming greater obstacles to trade than tariffs. India must, therefore, ensure that these non-tariff barriers do not hinder its export opportunities. To achieve this, it needs to identify innovative provisions within its FTAs that focus on minimising the costs of complying with these standards and regulations for India's exporters. India has been relatively less successful in this regard, making it a crucial area for further development and application as the country advances its FTA strategy.

Digitally delivered services are set to increasingly dominate the global value chain. India is the hub for Global Capability Centres (GCCs) mediating these emerging value chains. The growth of GCCs is central to fostering the next 'middle-class' revolution in India, creating millions of high-paying jobs in the country. India's FTAs with key economies must include measures that pre-empt any protectionism in market access for Indian services exports. Many of these protectionist measures are currently absent, not discussed, or not applied, so there is still time for pre-emption. While India has secured some binding commitments for the cross-border digital delivery of services, this remains a work in progress, and there is a need for a more comprehensive strategy on this front[14].

Ensuring gainful employment opportunities for India's large working-age population will require leveraging global demand for workers, particularly in countries with ageing populations where such demand is likely to emerge. Services chapters in FTAs present opportunities for India to secure binding commitments on labour mobility for skilled service workers. Moreover, India must proactively seek stand-alone bilateral mobility agreements outside of FTAs that would enable Indian industrial workers and less-skilled service workers to find employment globally.

Investment and Technology

FTAs play a crucial role in attracting investments into the country. As mentioned earlier, FTAs provide predictability concerning tariffs through binding commitments on reduced tariffs and on regulatory aspects of trade. Businesses are therefore more inclined to invest due to the reduced risk of policy-induced shocks once an FTA is established. There is robust empirical evidence linking binding tariff liberalisation and regulatory predictability in FTAs to significant increases in FDI. The impact of FTAs on boosting FDI is particularly evident in agreements between developed and developing countries (Laget et al. 2021).

India's FTA policy has been strategised based on the FTA-FDI linkage, which is why India has prioritised its FTAs with major industrialised economies. While the FTA-FDI linkage has traditionally been implicit, India has introduced innovations in FTA disciplines to create an explicit connection. It is important to note that the India-EFTA TEPA is the world's first FTA explicitly establishing a discipline linking market access outcomes to FDI.

The agreement acknowledges that one fundamental trade-off in FTAs with advanced countries is opening up India's vast and growing market in exchange for access to global value chains dominated by MNCs based in these advanced economies. FDI from these global MNCs and their affiliated suppliers in India will be crucial to India's capacity to expand manufacturing and exports. It will also be central to technology and skills transfer. The India-EFTA TEPA includes a commitment from EFTA member states led by Switzerland to invest USD 100 billion and create 1 million jobs in India within 15 years of the agreement's entry into force. This Indian innovation is being closely examined by other large developing economies seeking to emulate it in their FTAs.

FDI relies on the ease of doing business (EoDB). India has prioritised EoDB under Prime Minister Modi's leadership since 2014 and has made significant progress. Over 39,000 compliance requirements have been streamlined, and over 3,400 legal provisions have been decriminalised. A comprehensive programme led by the Department for Promotion of Industry and Internal Trade (DPIIT), involving both central and state governments, has been established to implement reforms. This is crucial since the vast majority of clearances and procedures investors face fall under state governments' jurisdiction. These ongoing efforts have elevated India's rank in the World Bank's EoDB Report from 142nd in 2014 to 63rd in 2019[15].

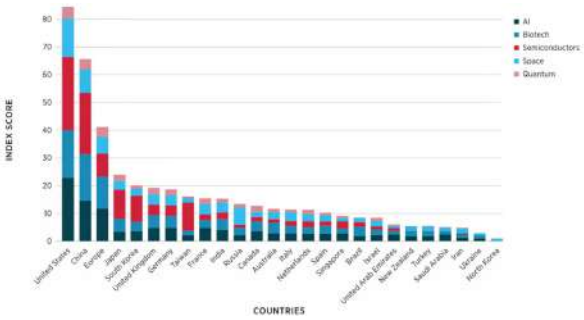
India is also exploring innovations within FTAs to incorporate disciplines on investment facilitation that offer greater assurance to investors. India's newer FTAs aim to include disciplines on good regulatory practices (GRP) that will help catalyse faster reforms within India, provide opportunities to learn from the best practices of its trade partners, and foster collaborations and capacity building in this area.

However, one area where India needs to bring greater policy focus and reform is Bilateral Investment Treaties (BITs). BITs protect foreign investors from adverse policy changes or conditions. The current model of BITs that India insists on is generally considered ineffective as it does not include disciplines that would assure foreign investors. For example, it excludes taxation policies from BITs, exposing foreign investors to sudden tax policy changes without any recourse in the investment treaty. They also require investors to exhaust all domestic legal remedies for a set period (e.g., five years) before resorting to international arbitration. This can lead to significant delays and discourage investors who prefer a quicker resolution process.

As India becomes an outward foreign investor, seeking access to essential raw materials, critical technology, and infrastructure assets to support its ambition of becoming a significant player in planned global trading corridors like IMEC, its firms will also require investment protection. Therefore, India's BITs must reflect this dual reality: Indian investment may also need safeguarding in a world characterised by policy uncertainty and shifting geopolitical concerns, where countries may be inclined to alter policies that affect investments.

Technology : Despite rapid advancements in key areas of technology and engineering and some remarkable achievements in space, defence, biotechnology, and other fields, India has yet to catch up with its peers. In a global economy where competitiveness is defined by the ability to access, adopt, and develop cutting-edge technology, India must implement strategies that minimise impediments to the accessibility and adoptability of technology. Access to technology is critical for India's successful integration and eventual leadership in two major transformations in the global economy: the green transition to more sustainable energy sources and the digital transition. Figure 5 illustrates India's relative position among global tech leaders in critical technologies. India is ranked 9th overall and significantly lags in areas such as semiconductors and quantum computing.

Figure 5: India's relative performance in key technologies among technology leaders



Source: Taken from the Emerging and Critical Technologies Index, published by the Harvard Kennedy School, Belfer Centre for Science and International Affairs, June 2025

Technology denial is an inherent aspect of geopolitical tension. Technology leaders like the EU, the US, and Japan increasingly attempt to withhold technological know-how and hardware from less-trusted players. The US policy of restricting the export of high-performance AI chips to only a few trusted countries is but one example of such emerging challenges.

India's independent courts and rule of law, which prevent technology theft and hold violators accountable, provide the foundation on which India could be regarded as a trusted partner for technology transfer by Western firms and countries. As FTAs enhance trade and investment linkages between India and industrialised economies, Western multinational technology leaders would have a significant incentive to engage in technology transfer and cooperation with India. As Table 2 illustrates, India ranks third among large developing and newly industrialised economies as a technology market and is the fastest-growing one.

Table 2: India as a market for technology: Relative importance among developing countries and NIE peers

Cumulative Payments for Use of Intellectual Property (USD bln, 2013-2022)		Total Growth in Payments for use of intellectual Property between 2013-2022	
China	198	India	167.1%
Korea	101	Vietnam	156.6%
India	42	China	111.2%
Taiwan	40	Malaysia	91.9%
Russian Federation	31	Turkiye	80.3%
Brazil	27	Brazil	53.3%
Thailand	26	Egypt	20.7%
Mexico	23	Thailand	20.4%
Malaysia	12	Indonesia	18.9%
Turkiye	12	Korea	18.7%
Indonesia	8.6	Mexico	13.7%
Argentina	8	Phillipines	4.1%
South Africa	7	Nigeria	-2.2%
Vietnam	4.8	Taiwan	-3.5%
Phillipines	3.4	Pakistan	-11.9%
Pakistan	1.8	Argentina	-24.4%
Egypt	1.6	South Africa	-25.0%
Nigeria	1.3	Russian Federation	-46.5%

Source: Calculations using the Trade in Services by Mode of Supply (TISMOS) database, WTO

India's vast pool of highly skilled labour (see Figure 2) offers another key advantage in joint technology

development and innovation. India has emerged as one of the largest defence procurers in the world. It has successfully leveraged its purchasing power to advocate for licensed production, joint product development, and technology partnerships. The recent successes in indigenous production and development are attributed to reforms in the procurement process and strategy involving the Indian private sector.

Military technologies have significant spillovers for non-military commercial applications. The US military-industrial complex is a prime example of cutting-edge commercial product development. From Ray-Ban sunglasses to the internet, the defence sector has been the source of some of the most successful commercial products. A strategic approach to India's defence procurement, as it expands in scale and scope to facilitate technology transfer, is critical to India's long-term trade and industrialisation policies. As Figure 3 illustrates, India is the world's fourth-largest defence spender, and its spending growth is second only to China among the leading countries.

Table 3: India as a defence spender: Relative importance among leading economies

Top Spenders (USD bln), cumulative 2013-2023		Top Growing (absolute growth), 2013-2023	
United States	8026	China	81%
China	2557	India	76%
Russian Federation	842	Korea, Rep.	40%
India	721	United States	35%
United Kingdom	671	Russian Federation	24%
France	573	France	18%
Japan	528	United Kingdom	17%
Korea, Rep.	463	Indonesia	13%
Brazil	280	Japan	2%
Indonesia	93	Brazil	-30%

Source: Calculations using World Bank Development Indicators Database

However, defence is not the only area where India's influence in government procurement is rapidly increasing. Indian government investment and procurement in renewables, telecommunications, transport, agriculture, and medicine should be effectively leveraged along the same lines as defence. Unlike in the case of defence, procurement in these other sectors is distributed across numerous departments and state governments. This dilutes the advantage of scale. A thought-out planning process is needed where procurement remains independent, yet is conducted in a coordinated manner to capitalise on scale advantages as an incentive for technology transfer and joint development in partnership with the Indian private sector.

Finally, as will be discussed later under industrial policy, India would need to engage actively in its multilateral trade strategy within the WTO to seek flexibilities in current WTO rules[16] to use performance requirements related to investment that is trying to cash in on India's large and growing market size. Such performance requirements may encompass technology transfer, training, or local sourcing (which facilitates tech transfer to local firms). For instance, a foreign firm keen on obtaining a share of India's USD 10 billion per year industrial wastewater treatment market could be subjected to technology transfer and local content requirements to enhance India's domestic capabilities in this vital area.

Developing Resilient Supply Chains : India depends significantly on foreign suppliers for critical goods and raw materials, including reliance on a single import source. In many instances, this singular source of imports is China, making India vulnerable to the potential weaponisation of supply chains. Figure 6 illustrates key areas of vulnerability for India.

Figure 6: Key Sectors and Associated Products of Supply-Chain Vulnerability for India

Source: Internal, unpublished analysis by the author

FTAs include disciplines that impose binding restrictions on partners, preventing export controls; that is, they reduce the risk of weaponisation of import dependencies. However, India has been reluctant to pursue deep commitments related to export controls due to its need to restrict exports of predominantly agricultural products to ensure food security and domestic price stability. Furthermore, India's FTA strategy excludes China as a partner, even though dependencies on China define the majority of India's supply-chain vulnerabilities. Nevertheless, India would benefit from reconsidering its soft commitments strategy to export controls with other trade partners, as such provisions are an essential mechanism for de-risking the supply chain. It should also be noted that WTO rules broadly prohibit export bans and restrictions, allowing members to apply them temporarily to prevent or alleviate critical shortages of foodstuffs or other essential products. However, WTO rules have been largely ineffective in preventing member states from restricting exports of various products.

India has also entered into agreements specific to supply chain security. These include the Indo-Pacific Economic Framework (IPEF) Supply Chain Agreement, which focuses on cooperation, information sharing, and joint crisis response mechanisms to minimise the impact of disruptions and enhance supply chain efficiency. India is also a signatory to the Mineral Security Partnership (MSP). The objective of the MSP is to coordinate policies among members to ensure effective access to critical minerals and collaborate to reduce dependencies on China overall.

India is also seeking to establish disciplines in its FTAs with countries that possess significant reserves of key natural resources, such as critical minerals, which will assist India in securing access to these resources. Examples of this strategy include discussions with Australia and Chile.

Indian policymakers are cognisant of the impact of disruptions at logistical chokepoints such as the Suez Canal and the Gulf of Aden. India has been focusing on creating alternative multi-modal linkages to supplement

the routes where such chokepoints are situated. These initiatives include the International North-South Corridor (INSTC), linking India with Central Asia, Russia, and Europe, as well as the India-Middle-East-Europe Corridor (IMEC), which provides an alternative connection between the Indian Ocean and the Mediterranean Sea, bypassing the Suez Canal and the Gulf of Aden. Additionally, the trilateral highway offers overland connectivity between India, Southeast Asia, and the South China Sea. Unfortunately, these initiatives are progressing slowly due to geopolitical tensions and other operational challenges. Nonetheless, they remain essential objectives for India's long-term supply chain resilience.

Last but not least, India must expand its domestic capabilities in key industries that are essential for national security, food security, and economic security. Industrial policy aimed at developing and enhancing indigenous capacity is crucial to this goal, and the next section discusses some pertinent issues regarding that topic.

Industrial Policy : India is increasingly caught between the aggressive use of state-led non-market unfair practices of the world's largest industrial economy—China—and the well-funded industrial policies of advanced industrialised economies. Between them, these actors are attempting to squeeze out the competition in key sectors that will define the future of the global economy. India's overall share in global manufacturing is a mere 2.9%, and in global manufacturing exports, it stands at 2.2%. Its share in high-tech sectors is just 2.7%. India must implement policies to support industrial development and competitiveness in these crucial sectors to catch up with dominant players. Since many of these policies could potentially conflict with WTO rules, for example, the performance requirements on foreign investment to aid technology transfer mentioned earlier, or subsidising inputs or credit for private industry, India would need to seek temporary flexibilities from such rules, arguing its developmental needs.

India must also find ways to discipline and limit unfair industrial policy actions that increase global developmental inequities and create global imbalances. This would entail countering China's non-market unfair practices and finding ways to curtail aggressive and excessive industrial policies in the advanced industrial economies.

Achieving the above would necessitate independently pursuing each of the three objectives across different platforms with various sets of allies:

1. **Pursuing flexibilities in global rules to create policy space for India's industrial policy:** India must ally with major developing countries in Asia, Africa, and Latin America, whose interests align. The group of African nations has already submitted proposals seeking similar solutions at the WTO. With the forthcoming WTO 14th Ministerial Conference, India would benefit from articulating a position that distinguishes the legitimate developmental aims of industrial policy in most developing countries from the predatory and mercantilist industrial policies found in non-market economies like China.
2. **Pursue reforms in WTO rules that check unfair trade and industrial policies in non-market economies and hold them accountable:** India's interests broadly align with those of the US, EU, and Japan in this objective. India would benefit from making common cause with these developed economies and seeking to include as many developing countries as possible, which are also suffering from such unfair practices, in an alliance. In fact, the US, EU, and Japan might be willing to agree to allow market-oriented developing countries to pursue legitimate development goals with much greater freedom in using subsidies and state support in exchange for assistance in developing international disciplines to hold non-market economies accountable for their policies.
3. **Ensure that developed economies are held accountable for their trade-distorting policies:** India must define parameters of development (per capita income, absolute number of poor people), along with the extent of global economic capabilities that prevent already prosperous countries, which have dominant industrial sectors, from using subsidies and state support that undermine competition and lead to the domination of industrial sectors by global oligopolies.

Conclusion

India's goal of Viksit Bharat will need to be achieved under far more challenging circumstances than those faced by countries like Japan, Korea, or China during their respective transitions. The world is experiencing a backlash against globalisation and open markets, geopolitical tensions are disrupting supply chains, and access to key technologies is becoming increasingly restricted for geostrategic reasons. The relatively open markets and globalising trends that had progressed from the twentieth century into the first decade of the 21st century are now being reversed.

Furthermore, technological shocks stemming from advancements such as automation and AI have significantly diminished the creation of new jobs linked to economic growth, making it increasingly easier and cheaper to replace human workers with machines. This reduction in space for 'labour-intensive' economic activities poses a considerable challenge for India, which must ensure productive engagement for the world's largest working-age population.

Adding to all this complexity is the challenge of imbalance in the global economy due to a huge non-market economy that has not played by the international rules governing trade and has weaponised both access to its market and its sheer dominance of supply chains against its competitors.

Finding comprehensive solutions that help India meet its developmental objectives by using access to global markets for goods, services, and human resources will require a focused approach involving deeper bilateral integration with major economies and regions through FTAs. Such FTAs must be complemented by matching initiatives that attract foreign investment and ensure

accessibility to key technologies. India must form effective alliances to tackle the challenge of supply-chain vulnerability and the weaponisation of over-dependence on a single trade partner.

All of this would require agility. India would often find itself allied with countries in opposing geopolitical camps as it pursues its priorities in the areas mentioned above. Balancing such complexities would demand finesse and a relentless pursuit of Indian interests. More importantly, it would necessitate consistency and continuity in Indian policies over this extended period.

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Endnotes

[1] Chinese state control of Banking and other investment agencies de-links investment decisions from market risks, and thereby expansion of capacities are not based on market based, risk informed decisions which would have otherwise prevented such investments

[2] How China's Overcapacity Holds Back Emerging Economies', Rhodium Group, June 2024

[3] Examples include Jaravel, X and E Sager (2019), 'What are the Price Effects of Trade? Evidence from the U.S. and Implications for Quantitative Trade Models', CEPR Discussion Paper No. 13902 and Bai, Liang and Sebastian Stumpner. 2019, "Estimating US Consumer Gains from Chinese Imports." American Economic Review: Insights, 1 (2): 209–24.

[4] Based on unpublished empirical research carried out by the author

[5] See China's export ban on engineers and equipment disrupts manufacturing overseas, Strait Times, Published Jan 20, 2025, Singapore

[6] See China's rare-earth curbs hit Indian auto industry, India Today, June 16th, 2025

[7] India-UK FTA was finalised in May 2025 and is expected to come into force in early 2026

[8] India has completed an early-harvest agreement with Australia and is currently negotiating to complete the comprehensive deal

[9] India is currently pursuing a Bilateral Trade Agreement with the US

[10] India has on-going negotiations with Oman

[11] India's neighbours are already covered by South Asia Free Trade Agreement or SAFTA

[12] Friendshoring refers to the practice of developing more resilient supply-chains by sourcing imports from countries that are more dependable, politically aligned and generally considered to be market oriented and rules based.

[13] These sectors typically have the maximum potential for future growth includes electronics, advanced engineering, chemicals, pharmaceuticals, precision engineering included robotics, renewable energy etc

[14] For a more detailed discussion, see Banerjee et al 2025b

[15] The Make in India Ease of Doing Business page provides a complete list (refer to: https://www.makeinindia.com/eodb#:~:text=India%20jumps%2079%20positions%20from,of%20Doing%20Business%20Ranking%2020202.&text=To%20further%20enhance%20the%20ease,legal%20provisions%20have%20been%20decriminalized)

[16] Under the WTO agreement on Trade Related Investment Measures or TRIMS

Source: indiafoundation.in

INDUSTRY REACTIONS TO UNION BUDGET 2026-27

STAFF WRITER

Industry leaders have broadly read Union Budget 2026 as a capex-led, manufacturing-focused and technology-driven fiscal statement rather than a short-term stimulus.

The Budget prioritises infrastructure expansion, semiconductor and electronics localisation, rare earth security, clean energy transition and targeted support for MSMEs. While most stakeholders see stronger investment visibility and supply-chain depth, the real test will be the speed and consistency of implementation across states and sectors.

The tabling of the Union Budget 2026–27 has elicited a broad spectrum of responses from industry leaders across manufacturing, infrastructure, energy, logistics, chemicals, and technology. Industry leaders have characterised the fiscal roadmap as a "definitive statement of intent," emphasising the government's unwavering commitment to infrastructure-led growth, manufacturing depth, and sustainable development. Key highlights such as the India Semiconductor Mission 2.0, the 10,000 crore MSME Growth Fund, and the record 12.2 lakh crore capital expenditure outlay are being viewed as pillars that will fortify India's position as a globally competitive manufacturing hub.

While expectations remain around faster execution and deeper structural reforms, the consensus suggests that Union Budget 2026–27 is viewed as a growth-supportive, investment-friendly, and macro-stable fiscal framework.

Here's is a curated set of reactions from industry leaders:

Abhay Deshpande, Founder & CEO, Recykal "Budget 2026 places strong emphasis on AI, semiconductors and digital infrastructure, strengthening India's national tech stack. This will deepen digital traceability, EPR enforcement and waste-to-resource systems critical to scaling the circular economy. Building on this momentum, integrating dedicated policy frameworks for EPR enforcement, waste-to-resource infrastructure, and incentives for digital traceability platforms will be crucial to realizing the full circular economy potential."

Abhishek Malik, Executive Director, Calcom Vision "The Union Budget 2026 reinforces India's manufacturing ambitions with an enhanced 40,000 crore outlay for electronics manufacturing and a 10,000 crore SME Growth Fund to strengthen domestic value chains. These measures will support innovation and scale across the sector, creating a more robust ecosystem in which companies like Calcom Vision can contribute to technology-driven growth and energy-efficient solutions, furthering India's journey as a globally competitive manufacturing hub."

Abhishek Shrivastava, MD, IMEA, The Lubrizol Corporation "Continued support for domestic manufacturing, logistics and skills, along with lower customs duties on chemical raw materials, will strengthen supply chains and export competitiveness, provided execution remains timely. The Budget's balanced approach, addressing structural bottlenecks while promoting higher value-added manufacturing supports sustainable growth and resilience. The recent clarity on the GST intermediary ruling also brings much-needed certainty for cross- border services, aiding ease of doing business."

Amit Gossain, Chairman and Managing Director, KONE Elevators India & South Asia "Higher capex of 12.2 lakh crore, urban focus in tier-2 and tier-3 cities, and sustained R&D support will accelerate smart urbanisation, logistics efficiency and future-ready infrastructure."

Amit Sharma, MD & CEO, Tata Consulting Engineers "High spending on infrastructure, high-speed rail, urban mobility, clean energy, semiconductors, data centres and rare earth corridors strengthens critical supply chains and elevates execution quality. Measures supporting hydrocarbons and chemicals, and metals and mining including rare earth corridors, strengthen critical supply chains."

Amitt Nenwani, MD, Shivtek Spechemi Industries Ltd "The announcement of three dedicated chemical parks provides a plug-and-play ecosystem that reduces supply-chain risk and strengthens India's transition to a specialty chemicals hub. With these new chemical corridors, we expect a significant reduction in logistics costs and a massive surge in R&D-led manufacturing, positioning India as the primary 'Plus One' for the global specialty chemicals market."

Anil Agarwal, **Chairman of Vedanta Ltd** "A growth-oriented Budget, with a clear focus on increasing public capital expenditure and boosting manufacturing… creating opportunities for youth to improve their livelihoods, women to become financially independent, and for employment-intensive sectors like medical tourism to take off."

Anurag Choudhary, **CMD and CEO, Himadri Speciality Chemical Limited** "The establishment of dedicated Rare Earth Corridors… is a watershed moment; it will create the integrated infrastructure needed to transform raw minerals into high-value components for the EV and defense sectors… moving India from intent to execution."

Bhuvan Anandakrishnan, India Country Manager & VP, Caterpillar "Predictable policy, infrastructure push and digital transformation improve long-term business resilience and support private investment-led growth."

Aravind Melligeri, **Executive Chairman & CEO, Aequs Limited** "The decision to allow eligible SEZ manufacturing units to sell into the Domestic Tariff Area at concessional duty is a significant boost for companies that have created large-scale capacities in both the consumer and aerospace & defence sectors… Together, these measures will create a stable and enabling framework for companies to scale investments, deepen capabilities, and integrate India more firmly into global manufacturing value chains."

Arun Shukla, **President and Director, JK Lakshmi Cement** "The Union Budget remains true to the Government's Viksit Bharat and 2070 Net Zero vision and sends a clear signal on the direction of India's growth—combining infrastructure-led development with a sharper focus on sustainability."

Atul Rai, CEO and CO founder of Staqu Technologies "The Union Budget 2026–27 clearly recognises artificial intelligence as a strategic driver of inclusive growth and governance efficiency… the government is creating a robust ecosystem for applied artificial intelligence."

Balbir Singh Dhillon, **Brand Director, Audi India** "The Union Budget's strong emphasis on infrastructure and capital expenditure is a positive enabler for India's mobility landscape. Improved highways and intercity connectivity are strengthening the ownership and usage ecosystem for luxury automobiles."

Benjamin Lin, **President, Delta Electronics India** "The 40,000 crore allocation for India Semiconductor Mission 2.0 and the enhanced outlay for electronics components manufacturing point to a clear focus on scale, depth, and ecosystem development."

C.S. Vigneshwar, President, FADA "Customs duty exemptions for lithium-ion cell manufacturing, rare earth corridors, 4,000 e-buses for the North-East, and TReDS mandates for MSMEs will stabilise EV supply chains and dealer liquidity. These measures, alongside the India Semiconductor Mission 2.0, will help stabilize the supply chain for modern vehicles."

CS (Dr.) Mamta Binani, President, MSME Development Forum – West Bengal "The 10,000-crore MSME Growth Fund strengthens access to capital, innovation and global integration at a time of liquidity stress and delayed payments. Coupled with enhanced credit access and structural support measures in the Budget, this move underscores the government's enduring commitment to unleashing the full potential of MSMEs — the backbone of India's industrial growth, employment generation, and export prowess."

D.V. Manjunatha, Founder & CMD, Emmvee Photovoltaic "The Budget shifts focus from incentives to execution, scale and quality in renewables, providing long-term certainty for domestic solar manufacturers. With the policy direction firmly in place, the emphasis now is on operational excellence, cost competitiveness, and building depth across the value chain."

Deepak Acharya, CEO, INOX India Limited "The Budget's sustained focus on energy through increased support for infrastructure, technology, and critical industrial sectors reinforces India's commitment to expanding reliable, low-carbon capacity while accelerating the shift toward cleaner fuels and future-ready technologies. These measures create a stable policy environment for investments in areas such as cryogenics, clean fuels, renewable energy components and high-value industrial equipment."

Dilip Oommen, **CEO, AM/NS India** "The continued outlay on capex for infrastructure is a welcome step to support industry's long-term growth. Measures to strengthen project financing, revive industrial clusters and expand infrastructure in Tier-2 and Tier-3 cities will also boost domestic manufacturing and competitiveness. At AM/NS India, we remain committed to supporting this nation-building effort through sustainable steelmaking and long-term investment in India's growth."

Dr. Uday Narang, **Founder and Chairman, Omega Seiki Pvt. Ltd** The strong push on advanced manufacturing, AI-led technologies, electronics and semiconductor expansion, rare-earth and battery supply chains, the 10,000 crore SME Growth Fund, and higher public capex will significantly strengthen the EV ecosystem. What stands out is the focus on ease of doing business and MSME financing, which lowers cost barriers and improves supply-chain resilience.

Harinder Singh, **Managing Director & CEO, Yokohama India Pvt. Ltd**. "Enhanced support for electronic components manufacturing, battery storage, lithium-ion cells and critical minerals creates long-term policy visibility for EV platform localisation, battery assembly and advanced power electronics manufacturing, thereby strengthening investment confidence across emerging mobility ecosystems."

Jasraaj S. Kalra, **Managing Director, Noble Group** "Reviving 2,000 industrial clusters and setting up a 10,000 crore MSME growth fund is a very welcome signal for manufacturing. For many MSMEs in our ecosystem, equity support and day-to-day liquidity are serious bottlenecks. If this fund translates into easier access to growth capital, especially for cluster-level suppliers, tool rooms and component makers, it will lift the entire value chain and give manufacturers a lot more confidence to invest in capacity and localisation."

Mukesh Vasani, **Chairman & Managing Director, Aimtron Electronics** "The 40,000 crore allocation for electronics components and semiconductors will directly benefit Aimtron by improving domestic availability of semiconductor-linked components, reducing import dependence, and enabling faster scale-up of our EMS, PCB assembly, box-build, and system integration operations serving India, the US, and global customers. Coupled with the SME Growth Fund and logistics-led infrastructure investments, the budget reinforces India's role as a trusted, export-ready manufacturing hub,

aligning closely with Aimtron's India–US growth strategy."

Nikhil Mansukhani, **Managing Director, MAN Industries** "The continued emphasis on ease of doing business, coupled with policy stability, will go a long way in encouraging manufacturers to plan long-term capacity expansion and technology investments. Particularly encouraging are the measures aimed at simplifying customs procedures and rationalising duties, which will help reduce cost inefficiencies, improve turnaround times at ports, and enhance supply chain reliability. The focus on integrating Indian manufacturing more deeply into global value chains aligns well with the 'Make in India for the World' vision."

Niranjan Nayak, **MD, Delta Electronics India** "What stands out in the Union Budget 2026 is the scale, consistency, and seriousness with which the government is approaching electronics and advanced manufacturing. Importantly, the focus goes beyond manufacturing capacity to include full-stack design, development of Indian intellectual property, skill creation, and stronger supply-chain resilience. This reflects a practical understanding of how globally competitive technology ecosystems are built."

Parmod Sagar, **Chairman, MD & CEO RHI Magnesita India** "The government's budgetary commitment of 20,000 crore towards CCUS across key sectors is a forward-looking step. This will further strengthen industry–government collaboration in accelerating progress toward India's net zero goals."

Parth Jindal, President, Cement Manufacturers' Association "Higher public capex, City Economic Regions, new freight corridors, expanded waterways and a 20,000-crore CCUS outlay strengthen demand visibility, logistics efficiency and decarbonisation for cement."

Pawan Kumar Garg, Chairman & JMD, Fujiyama Power Systems "India Semiconductor Mission 2.0, coupled with stronger solar and storage value chains, advances both technology leadership and clean energy security. These combined priorities will not only accelerate India's technology and sustainability ambitions but also unlock meaningful opportunities for innovation and industrial growth."

Prashant Mathur, CEO, Saatvik Green Energy "12.21 lakh crore capex, 29% higher PM Surya Ghar allocation, battery storage duty exemptions, and solar glass input relief improve cost competitiveness and investment visibility across the solar value chain. The continued focus on carbon capture technologies and long-term support for nuclear power underline a technology-agnostic approach to decarbonisation."

Priyank Rakholiya, Co-Founder, Samarth E Mobility "The FY26 Union Budget backs India's push for a self-reliant, globally competitive EV ecosystem and homegrown innovation. Removing customs duty on 30 critical minerals strengthens domestic supply chains and supports Make in India. Extending the 18,100 crore PLI scheme for advanced chemistry cells to 2032 gives certainty for startups like Samarth E Mobility and the EV sector. A 10% capex cut for factories and tax exemptions on lithium-ion goods improve project viability, cut battery costs by 2.7% and accelerate localisation."

Rajamani Krishnamurti, President, ISSDA "Greater investment in rail, water and urban infrastructure strengthens the case for stainless steel, while the 10,000-crore MSME allocation will upgrade quality, technology and standards across the sector. This policy direction, focused on quality-centric procurement and standards enforcement, coupled with robust support for MSMEs, will be instrumental in enhancing material choices across public projects."

Rajendra Chodankar, Founder & Chairman, RRP Electronics "ISM 2.0's 40,000-crore outlay, expanded ECMS funding, and new high-tech tool rooms deepen domestic semiconductor and electronics supply chains. This support for the production of PCBs, modules, and sub-assemblies is essential for building a local supply chain that feeds into the semiconductor sector."

Rajesh Gupta, MD & Founder, Evergreen Recyclekaro "Dedicated rare earth corridors, chemical clusters and ISM 2.0 mark a shift from assembly-led growth to control over critical materials and strategic inputs. This clearly reflects India's shift from assembly led growth to building control over critical materials and strategic inputs."

S. Sunil Kumar, Country President, Henkel Adhesives "Transport corridors, electronics manufacturing support and the 20,000-crore CCUS allocation strengthen demand for high-performance industrial materials while embedding sustainability in growth. Taken together, the Budget underscores a responsible growth framework anchored in inclusivity, capability building and long-term competitiveness, and we would like to credit the government for this."

Sandeep Kumar, Co-founder & MD, A-One Steel "The announcement of a 20,000 crore carbon capture and utilisation scheme marks an important step for decarbonising steel manufacturing while safeguarding competitiveness. Combined with fiscal discipline and infrastructure-led growth, the Budget creates a balanced framework where sustainability and scale move together. This clarity on green transition, alongside steady demand drivers, supports long-term investments in cleaner technologies and modern production facilities."

Sanjay Chitkara, Co-CSMO, LG Electronics India "Higher capex, ISM 2.0, duty exemptions and MSME funding strengthen local electronics supply chains while tax rationalisation supports consumption. Measures such as duty exemptions, MSME funding, and improved infrastructure will strengthen supply chains and enhance industry competitiveness."

Sanjay Choudhari, Chairman, SBL Energy "Rare earth corridors and downstream processing reduce strategic dependencies, while chemical parks move India towards integrated industrial ecosystems.

To sum it all up, these measures reduce import dependence, build supply-chain resilience, and position India as a more reliable and competitive player in global manufacturing networks."

Santosh Iyer, MD & CEO, Mercedes-Benz India "Higher capex, better highways, and a 4.3% fiscal deficit target improve macro stability, ease of doing business and cash flows via deferred customs payments."

Satyen J. Mamtora, CEO & MD, TARIL "Higher ECMS outlay, battery and solar glass duty exemptions, and nuclear duty relief till 2035 improve policy visibility for power and grid infrastructure."

Saurabh Marda, Co-Founder & MD, Freyr Energy "REC and PFC restructuring should improve consumer solar financing, while continued battery storage support strengthens domestic clean energy capacity."

Shyam Sunder Jindal, Promoter, BC Jindal Group "Duty exemptions for lithium-ion cells and solar glass inputs support India's 500 GW non-fossil capacity target and strengthen domestic manufacturing."

Simarpreet Singh, Executive Director & CEO, Hartek Group "Industry-linked skilling, solar input duty relief and zero duty on lithium-ion capital goods will accelerate storage adoption and grid stability."

Smitha Shetty, Regional Director, APAC, Achilles Information "ISM 2.0, rare earth corridors and chemical clusters signal a decisive move towards deeper manufacturing depth and resilient supply chains."

Sujay Shetty, MD (ESDM & Semiconductor), PwC India "ISM 2.0's focus on domestic equipment, materials, IP, R&D and skilling, alongside rare earth corridors, could elevate India's position in the global semiconductor value chain."

Sumant Sinha, Founder & CEO, ReNew "Lower duties on strategic inputs, focus on critical minerals, CCUS and next-generation nuclear underline a long-term, technology-driven energy transition."

Tadashi Chiba, MD & CEO, Panasonic India "12.2 lakh crore capex, stronger ECMS support, and selective appliance duty exemptions improve domestic value addition, while AI-led governance enhances productivity."

Tanmoy Duari, CEO, AXITEC Energy India "1,775 crore for grid solar, zero duty on transition equipment, and REC-PFC restructuring strengthen renewable financing and manufacturing competitiveness."

Vikrampati Singhania, President, ACMA & Vice Chairman, JK Fenner "Sustained MSME support, clean mobility measures and export facilitation will help auto components remain competitive amid global headwinds. The focus on exports, trade facilitation and logistics efficiency is timely, particularly in the context of global trade uncertainties. Measures to improve access to export credit and address non-tariff barriers will further integrate Indian auto component manufacturers into global supply chains and reinforce India's position as a reliable sourcing hub."

Vikrant Labde, Co-founder & CTO, Turinton Consulting "India Semiconductor Mission 2.0 is a turning point as it shifts the focus from fabs to full-stack IP development. Semiconductor manufacturing is inherently data-intensive and precision-driven, where success will depend on digital twins, predictive maintenance, yield optimisation, and real-time quality control powered by AI. Equally, in broader manufacturing and Industry 4.0, the priority should be layered intelligence over brownfield assets rather than replacing them. Manufacturers need decision-support systems that integrate with legacy machines, reduce downtime through predictive maintenance, optimise production scheduling, and strengthen quality control. "

Vikram Joshe, Founder & President, WAE "The 10,000-crore SME Growth Fund benefits a limited cohort of formal firms, while payment delays, tax complexity and demand constraints remain unresolved for most SMEs."

Vinay Thadani, Director & CEO, GREW Solar "40,000 crore for semiconductors and domestic solar components reduces import dependence, boosts exports and strengthens clean energy manufacturing."

Vinesh Mehta, Chairman, Abhay Ispat "Urban housing, transport and renewable focus will lift steel demand, while the 20,000-crore CCUS plan supports large-scale industrial decarbonisation."

Vinod Aggarwal, MD & CEO, VE Commercial Vehicles "With a clear focus to build capability in crucial areas, the budget reinforces the foundations of the automotive and commercial vehicle industry. 12.2 lakh crore capex sustains demand for logistics assets, while rare earth corridors strengthen EV supply chains and battery localisation. On the clean mobility front, the continuation of duty exemptions on capital goods for battery manufacturing, alongside targeted incentives for localized processing, sends a strong signal of intent. These measures are instrumental in accelerating EV adoption while building a cost-efficient battery ecosystem—crucial for improving the Total Cost of Ownership and driving wider commercial viability."

Vishal Sharma, CEO, Godrej Industries (Chemicals) "The reforms around extra funding for R&D is big for chemical sector where progress depends on constant innovation, especially in advanced materials, specialty chemicals, and fresh sustainable solutions. While the budget lays out a clear strategy, the industry would have welcomed stronger fiscal incentives for capital-heavy green tech, quicker clarity on the new labour codes, and more focused support for exports. Moves like these would help chemical companies attract more investment and compete faster on the global stage. Still, the 'Reform Express' narrative inspires confidence and provides a solid platform for sustainable, technology-driven manufacturing growth in India."

Source: www.manufacturingtodayindia.com

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INDIA'S UNION BUDGET FY 2026-27: KEY HIGHLIGHTS

Finance Minister Nirmala Sitharaman presented the Union Budget for the financial year 2026–27 earlier today, February 1, 2026 in Parliament. The Budget is framed against a backdrop of global economic uncertainty, supply chain realignments, and evolving investment dynamics, while reaffirming India's focus on sustained growth and fiscal discipline.

While presenting the Budget, the finance minister stated that the government aims to "**transform aspiration into achievement and potential into performance**." She described this year's Budget as a **Yuva Shakti–driven Budget** with proposals emphasising the strengthening of domestic manufacturing, scaling high-growth services, and reinforcing infrastructure as key drivers of long-term economic expansion.

Reflecting on the country's growth journey so far, the finance minister also said, "We have pursued far-reaching structural reforms, (fiscal prudence and monetary stability whilst (maintaining a strong thrust on public investment. Keeping atmanirbharta as a lodestar, we have built domestic manufacturing capacity, energy security and reduced critical import dependencies." She also said, "We have ensured that citizens must benefit from every action of the Government, undertaking reforms to support employment generation, agricultural productivity, household purchasing power and universal services to people."

This year's Union Budget underscores the importance of regulatory certainty, ease of doing business, and targeted reforms to attract long-term capital and deepen India's integration with global markets.

Let's look at the key focus areas of the Union Budget 2026–27:

Budget theme

1. **Yuva Shakti–driven growth:** Converting India's demographic dividend into productive capacity through skilling, employment, and enterprise creation.
2. **Three Kartavya (duties) guiding this year's Budget**

- Accelerating and sustaining economic growth by enhancing productivity, competitiveness, and resilience amid volatile global dynamics.
- Fulfilling aspirations and building capacity by strengthening human capital, skills, and institutional capabilities.
- Advancing Sabka Sath, Sabka Vikas by ensuring equitable access to opportunities across regions, communities, and sectors.

3. **Investment-led development focus**

- Scaling manufacturing in strategic and frontier sectors.
- Strengthening MSMEs as growth partners and supply-chain anchors.
- Reinforcing services as a core driver of growth, employment, and exports.

4. **Strengthening India's investment ecosystem**

- Sustained public capital expenditure to crowd in private investment.
- Infrastructure-led regional development, especially in Tier II and Tier III cities.
- Long-term energy security, climate technologies, and resource resilience.

5. **Enhancing ease of doing business and capital flows**

- Regulatory simplification, tax certainty, and trust-based compliance.
- Measures to improve FDI facilitation, portfolio investment, and global integration.
- Launch of an Investment Friendliness Index of States in 2025, aimed at promoting competitive cooperative federalism and encouraging states to strengthen policy frameworks, facilitation mechanisms, and investor responsiveness.

Biopharma

The Union Budget 2026–27 places biopharmaceuticals at the centre of India's strategy to scale up manufacturing in strategic and frontier sectors. To support the development of India as a global biopharma manufacturing hub, the Budget introduces a comprehensive framework to create an ecosystem, build capacity, and enable clinical research:

1. Biopharma SHAKTI

(Strategy for Healthcare Advancement through Knowledge, Technology & Innovation)

- Biopharma SHAKTI aims to develop India as a global biopharma manufacturing hub.
- The scheme will be launched with an outlay of 10,000 crore over the next five years.
- It will focus on building an ecosystem for the domestic production of biologics and biosimilars. The initiative will include the establishment of a biopharma-focused institutional network, comprising three new National Institutes of Pharmaceutical Education and Research (NIPERs) and the upgradation of seven existing institutes.
- A network of over 1,000 accredited clinical trial sites will be created to strengthen India's clinical

research and development capabilities.

2. Institutional and Talent Capacity Development

- Establishment of three new national institutes and upgradation of seven existing institutes to strengthen advanced pharmaceutical education, research, and skills development.
- Alignment of academic and research capabilities with industry requirements and global benchmarks.

3. Clinical Research and Regulatory Infrastructure

- Creation of a network of 1,000 accredited clinical drug trial sites across the country.
- Strengthening of regulatory processes to improve approval timelines and enhance global acceptance of Indian-manufactured biopharma products.

Manufacturing : Through targeted schemes, cluster-based development, and capacity expansion, the Budget aims to create an enabling environment for long-term industrial investment in India. Key initiatives to scale up manufacturing in strategic and frontier sectors include:

Biopharma SHAKTI Scheme

- To develop India as a global biopharma manufacturing hub through ecosystem-led capacity creation

India Semiconductor Mission (ISM) 2.0

- To expand India's semiconductor capabilities across equipment, materials, design, and supply-chain resilience, with an enhanced outlay of 40,000 crore

Electronics Components Manufacturing Scheme

- Outlay to be increased to 40,000 crore to deepen domestic value addition and capitalise on rising investment momentum

Rare Earth Corridors

- Establishment of dedicated corridors in Odisha, Kerala, Andhra Pradesh, and Tamil Nadu to promote mining, processing, research, and manufacturing of rare earth materials

Chemical Manufacturing Infrastructure

- Support for States to establish three dedicated Chemical Parks on a cluster-based, plug-and-play model to strengthen domestic chemical production

Construction and Infrastructure Equipment (CIE)

- Introduction of a scheme to enhance domestic manufacturing of high-value and technologically advanced construction and infrastructure equipment

Container Manufacturing

- Launch of a dedicated Container Manufacturing Scheme with a budgetary allocation of 10,000 crore over five years to build globally competitive capacity

Rejuvenation of Legacy Industrial Clusters

- Introduction of a scheme to revive 200 legacy industrial clusters through infrastructure and technology upgradation to improve cost competitiveness and efficiency

Textiles

The Union Budget 2026–27 reaffirms textiles as a priority labour-intensive sector with strong linkages to employment, exports, and regional manufacturing clusters. The Budget adopts an integrated approach to modernise traditional textile ecosystems, strengthen fibre self-reliance, and upgrade skills across the value chain. Key measures for the textile sector include:

Integrated Textile Programme comprising five components:

- National Fibre Scheme to support self-reliance in natural, man-made, and new-age fibres
- Textile Expansion and Employment Scheme to modernise traditional clusters through capital support for machinery and technology upgradation
- National Handloom and Handicraft Programme to integrate and strengthen existing schemes for artisans and weavers
- Tex-Eco Initiative to promote globally competitive and sustainable textiles and apparel
- Samarth 2.0 to modernise and upgrade the textile skilling ecosystem through industry and academic collaboration

These measures aim to enhance productivity, support value addition, and strengthen India's position in global textile and apparel markets.

Infrastructure

The Union Budget maintains a strong focus on public capital expenditure to support logistics efficiency, urban development, and industrial expansion, thereby crowding in private investment.

Key infrastructure-related initiatives include:

- Public capital expenditure of 12.2 lakh crore in FY27 to sustain momentum in infrastructure creation
- Development of seven High-Speed Rail corridors to strengthen inter-city connectivity and support economic agglomeration across major growth regions.
- Expansion of inland water transport through the operationalisation of 20 new National Waterways, improving logistics efficiency and connectivity between industrial clusters, mineral-rich regions, and ports.

- Continued focus on infrastructure development in Tier II and Tier III cities with populations exceeding 5 lakh, which have emerged as new growth centres
- Development of City Economic Regions (CERs), with an allocation of 5,000 crore per region over five years, to unlock agglomeration-led growth and strengthen urban economic clusters through a challenge-based, reform-linked financing model.
- Infrastructure-led regional development to support manufacturing clusters, services hubs, and urban economic regions

Champion SMEs and Micro Enterprises

Recognising MSMEs as a critical driver of employment, exports, and supply-chain resilience, the Budget introduces targeted measures to support their scale-up and formalisation.

Key initiatives include:

- Creation of Champion SMEs through targeted equity, liquidity, and professional support
- Enhanced access to capital and risk finance to support growth-oriented enterprises
- Introduced a dedicated 10,000 crore SME Growth Fund to create future Champions, incentivising enterprises based on select criteria
- A 2,000 crore top-up for the Self-Reliant India Fund, set up in 2021, to support micro enterprises and maintain their access to risk capital

Digital Infrastructure and Data Centres

The budget places digital infrastructure at the centre of India's investment-led growth strategy, recognising data centres and cloud services as critical enablers of the digital economy, artificial intelligence, and next-generation services. The Budget signals long-term policy stability and regulatory certainty, supporting large-scale investments in data storage, processing, and digital service delivery.

Key measures to strengthen digital infrastructure and attract investment include:

1. Tax holiday till 2047 for data centre operations

- Introduction of a long-term tax holiday for foreign companies providing cloud services using data centre infrastructure in India
- Intended to provide predictability and investment certainty for hyperscalers, cloud service providers, and digital infrastructure investors
- Applicable to data centre operations commencing on or before March 31, 2031
- Companies, however, need to provide services to Indian customers through an Indian reseller entity
- A safe harbour of 15% on cost to be provided if the company providing data centre services from India is a related entity

2. Support for large-scale digital infrastructure development

- Reinforcement of India's position as a preferred destination for data centre investments, supported by improving power availability, connectivity, and regulatory frameworks
- Alignment with growing demand from digital services, fintech, e-commerce, AI, and global capability centres

3. Enabling ecosystem for digital and technology-driven services

- Strengthening the foundation for high-growth digital sectors, including cloud computing, artificial intelligence, analytics, and platform-based services
- Integration of digital infrastructure development with broader initiatives on ease of doing business, tax certainty, and investment facilitation

Education, Skills and Services-Led Growth

The Union Budget 2026–27 reinforces the role of services as a core driver of growth, employment, and exports, supported by targeted institutional and skills-building interventions.

Key initiatives include:

- Establishment of a High-Powered 'Education to Employment and Enterprise' Standing Committee
- Focus on strengthening the services sector to achieve a 10% global share by 2047
- Rationalisation of taxation for IT services, including software development services, ITeS, KPO, and contract R&D, under a unified category of Information Technology Services with a common safe harbour framework

AVGC and Creative Economy

The Budget recognises the growing role of the creative economy or the Orange Economy as a source of skilled employment and export potential. Key initiatives include:

- Support for the Animation, Visual Effects, Gaming and Comics (AVGC) sector, projected to require 2 million professionals by 2030
- Strengthening of creative talent pipelines through the establishment of AVGC Content Creator Labs in 15,000 secondary schools and 500 colleges, supported by the Indian Institute of Creative Technologies, Mumbai

Climate Technologies and Energy Transition

The Budget strengthens India's commitment to climate action and industrial decarbonisation through targeted support for emerging clean technologies.

Key measures include:

- Carbon Capture Utilisation and Storage (CCUS)
- Proposed outlay of 20,000 crore over the next five years
- Focus on scaling CCUS technologies and achieving higher readiness levels across five industrial sectors: power, steel, cement, refineries, and chemicals

These initiatives aim to support India's long-term energy security while enabling cleaner industrial growth.

Healthcare and Medical Value Tourism

The Budget emphasises strengthening healthcare services and positioning India as a global destination for medical value tourism.

Key initiatives proposed for strengthening the healthcare workforce include:

- Expansion of institutions for Allied Health Professionals (AHPs) to address skill gaps across critical disciplines
- Coverage of multiple healthcare roles, including diagnostics, clinical support, and behavioural health services
- Creation of a stronger talent pipeline to support both domestic healthcare needs and international patient services

Care Economy and Allied Health Services

- Development of a structured care ecosystem covering geriatric and allied care services
- Introduction of nationally aligned training programmes to support multi-skilled caregivers
- Intended to improve service quality, address demographic shifts, and generate employment across healthcare and care services

AYUSH and Traditional Medicine

Strengthening India's traditional medicine ecosystem

- Establishment of new All India Institutes of Ayurveda
- Upgradation of AYUSH pharmacies and drug testing laboratories to improve certification and quality standards
- Enhancement of research, training, and global outreach for traditional medicine systems

Healthcare Infrastructure and Trauma Care

Expansion of emergency and trauma care capacity through

- Establishment of new institutions and upgradation of existing mental health and trauma care facilities
- Strengthening district-level healthcare infrastructure to improve access and resilience

Medical Value Tourism Hubs

Support for States to establish five Regional Medical Value Tourism Hubs in partnership with the private sector. These hubs are envisaged as integrated healthcare complexes, combining:

- Advanced medical and surgical services
- Medical education and research institutions
- Diagnostics, post-treatment care, and rehabilitation infrastructure
- Dedicated facilitation centres for international patients

Tourism

This year's Budget has adopted a comprehensive approach to strengthen tourism infrastructure, enhance skills development, and leverage digital platforms to improve visitor experiences and destination management. Key initiatives to strengthen the tourism sector include:

1. Destination development and experiential tourism

- Development of 15 archaeological sites into vibrant, experiential cultural destinations through curated access and immersive interpretation
- Promotion of ecologically sustainable tourism, including mountain trails, turtle trails, and bird-watching trails across select regions

2. Regional and niche tourism promotion

- Targeted initiatives to strengthen tourism circuits in emerging destinations, including heritage, spiritual, and nature-based tourism hubs
- Alignment of tourism development with regional infrastructure and connectivity initiatives

These measures aim to position tourism as a scalable economic activity that supports job creation, regional development, and investment opportunities across hospitality, transport, digital services and allied sectors.

Tax Reforms

- Introduction of a simplified and modernised Income Tax framework, with redesigned rules and forms to reduce compliance complexity and improve ease of filing.
- Tax holiday till 2047 for foreign companies providing cloud services using data centre infrastructure in India, aimed at strengthening India's position as a global data centre and digital services hub.
- Measures to reduce litigation and improve trust-based tax administration, including rationalisation of penalties, decriminalisation of minor offences,

and integration of assessment and penalty proceedings.

- Extension and rationalisation of safe harbour provisions, particularly for Information Technology and IT-enabled services, to provide greater certainty on transfer pricing and tax outcomes.
- Targeted tax measures to support manufacturing, services, and export-oriented sectors, including incentives for data centres, cloud services, toll manufacturing, and bonded warehousing.
- Reforms to support foreign investment and global mobility, including exemptions and simplified tax treatment for non-resident experts and foreign service providers operating from India.
- Rationalisation of customs and indirect tax provisions to support energy transition, critical minerals, electronics manufacturing, and export competitiveness.
- Continued emphasis on predictability, transparency, and stability in the tax regime, aimed at improving India's overall investment climate and long-term investor confidence.

Customs reforms

- Simplification of the customs tariff structure to support domestic manufacturing, promote export competitiveness, and correct duty inversion.
- Phased removal of long-standing customs duty exemptions on items manufactured domestically or where imports are negligible.
- Incorporation of effective rates from customs notifications directly into the tariff schedule to improve transparency and certainty for businesses.
- Expansion of duty-free and concessional duty provisions to support export-oriented sectors, including marine products, leather, textiles, electronics, and energy transition technologies.
- Enhanced trust-based customs systems, including extended duty deferment periods and greater facilitation for authorised and compliant importers, to enable faster clearance and reduced transaction costs.
- Measures to improve customs processes through automation and risk-based assessments, supporting smoother movement of goods across borders and strengthening India's trade facilitation framework.

Source: www.investindia.gov.in

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Indian Institute of Materials Management

MISSION

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

OBJECTIVE

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

CODE OF ETHICS

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

NEW TRADE CORRIDORS, NEW OPPORTUNITIES: HOW INDIA'S 2026 TRADE DEALS WILL TRANSFORM FREIGHT FORWARDING AND SUPPLY CHAINS

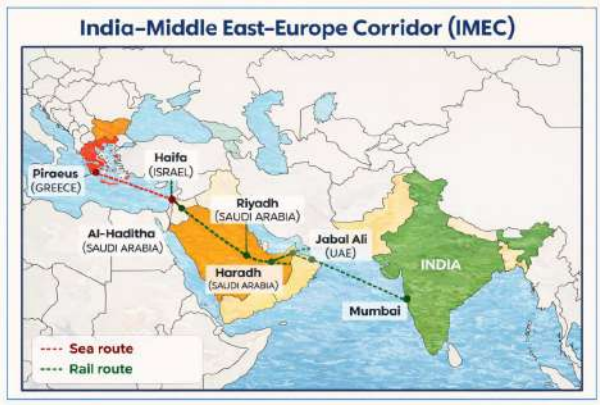
The reshaping of global trade lanes in 2026 is no longer theoretical. With negotiations between the European Union and India reaching a decisive phase, and the India–US Bilateral Trade Pact confirmed in February 2026, logistics and freight forwarding are entering a period of accelerated change. For forwarders, carriers, and supply chain stakeholders, these agreements are not just political milestones – they are structural shifts that will redefine volumes, routes, compliance expectations, and competitive advantage.

We explore how the India–EU Trade and Investment Agreement and the India–US Bilateral Trade Pact are set to impact logistics and freight forwarding, and why participation in a global logistics network such as 4NEXT Global is becoming a strategic necessity rather than just a nice-to-have.

Global context: why India is now central to global supply chains

India has spent the last decade positioning itself as a credible alternative and complement to China in global manufacturing and sourcing strategies. With sustained GDP growth, heavy infrastructure investment, port modernisation, and production-linked incentive (PLI) schemes, India is now firmly embedded in nearshoring and "China+1" strategies across both Western and Asian markets.

What has been missing until now has been the legal and commercial scaffolding to fully unlock trade flows at scale with major partners such as the European Union and the United States. The 2026 trade agreements aim to address exactly that gap.



The India–EU Trade and Investment Agreement: implications for logistics

The India–EU Trade and Investment Agreement is expected to be one of the most comprehensive FTAs India has ever signed. Beyond tariff reductions, it focuses heavily on regulatory alignment, services liberalisation, digital trade, sustainability, and investment protection.

From a logistics and freight forwarding perspective, several impacts stand out.

First, tariff liberalisation will significantly increase bilateral trade volumes. Reduced or eliminated duties on automotive components, pharmaceuticals, textiles, machinery, chemicals, and electronics will stimulate both exports from India to Europe and imports into India. For freight forwarders, this means sustained growth in containerised sea freight, air cargo for high-value goods, and project cargo linked to manufacturing expansion.

Second, customs simplification and regulatory alignment will reduce friction at borders. The agreement is expected to introduce streamlined customs procedures, greater use of digital documentation, and improved transparency in inspections. This directly benefits forwarders that can offer compliant, tech-enabled customs brokerage across multiple EU member states and Indian gateways.

Third, sustainability requirements will reshape routing and carrier selection. The EU's environmental regulations, including carbon reporting and emissions-related disclosures, will increasingly apply to Indian exporters serving Europe. Logistics providers will need to offer greener transport options, optimised routing, and reliable emissions data. Networks that share best practice and approved partners across regions will have a clear advantage.

Fourth, services liberalisation will open doors for European and Indian logistics firms to operate more freely in each other's markets. This increases competition, but also partnership potential. Forwarders with trusted partners on both sides will be able to scale faster without the risks of setting up standalone operations.

The India–US Bilateral Trade Pact (February 2026): a Different but Equally Powerful Catalyst

While the India–EU agreement is broad and regulatory-heavy, the India–US Bilateral Trade Pact signed in February 2026 is more commercially focused and speed-oriented.

The US–India pact places strong emphasis on market access, supply chain security, and strategic industries. Key beneficiaries include technology hardware, semiconductors, pharmaceuticals, defence-related manufacturing, agriculture, and energy equipment.

For logistics and freight forwarding, the impacts will be immediate.

Air freight volumes between India and the US are expected to rise sharply, particularly for electronics, medical supplies, and time-critical manufacturing inputs. Forwarders with strong India–US air cargo partnerships, capacity agreements, and consolidation capabilities will be in high demand.

Ocean freight will also see growth, particularly on East Coast and Gulf routes, driven by diversified sourcing away from East Asia. US importers are increasingly favouring Indian suppliers to reduce geopolitical risk, and logistics providers must adapt routing strategies accordingly.

Another critical aspect is supply chain resilience. The pact prioritises secure, transparent supply chains, which means greater scrutiny of origin, handling, and compliance. Freight forwarders that can demonstrate end-to-end visibility and robust partner networks will be preferred over transactional providers. Warehousing, fulfilment, and multimodal logistics in India are also set to expand rapidly as US companies invest in Indian manufacturing and export hubs. This creates opportunities for international forwarders to collaborate with local specialists rather than attempting to build capabilities from scratch.

Combined Impact: a Surge in Complexity, Opportunity and Competition

Taken together, the India–EU and India–US agreements will dramatically increase India's trade throughput with two of the world's largest economic blocs. More cargo, more lanes, more regulations, and more competition will follow.

For logistics providers, the challenge is not whether opportunity exists but whether they are positioned to capture it efficiently and profitably.

Smaller and mid-sized freight forwarders in particular will face a dilemma. The scale of these trade corridors demands local expertise, regulatory knowledge, and trusted operational partners in multiple countries simultaneously. Attempting to manage this through ad-hoc agents or one-off relationships introduces risk, inconsistency, and reputational exposure.

This is where global logistics networks become critical.

Why Global Logistics Networks Matter More Than Ever

A global logistics network is no longer just a membership badge. In the context of major trade agreements, it becomes an operational and commercial multiplier. Networks like 4NEXT Global provide structured access to vetted, like-minded freight forwarders across key trade lanes. This is particularly valuable when entering or scaling within complex markets such as India, the EU, and the US simultaneously.

One of the most immediate benefits is trusted market entry. When new trade lanes open or expand rapidly, speed matters. Having pre-qualified partners in ports, airports, and inland hubs allows forwarders to respond to client demand without months of due diligence.

Consistency of service is another major advantage. As trade volumes grow, shippers expect uniform standards, communication, and problem-solving across borders. A network aligned around shared values and service expectations reduces friction and protects brand reputation.

Knowledge sharing is also increasingly important. Trade agreements evolve, and regulatory interpretation differs by country. Being part of a network enables members to share real-world insights on customs changes, compliance pitfalls, carrier performance, and market trends long before they appear in formal guidance.

Commercial collaboration should not be underestimated either. Networks create reciprocal business opportunities, co-loading arrangements, and joint solutions for multinational clients. In high-growth corridors like India–EU and India–US, this collaboration can be the difference between winning and losing key accounts.

How Forwarders can Practically Benefit from the New Trade Landscape

To capitalise on these agreements, logistics companies should take several strategic steps.
1) Review and realign trade lane priorities – India should no longer be treated as a secondary or "emerging" market. Dedicated India-focused strategies for Europe and the US are now essential.

2) Strengthen compliance and digital capabilities – Faster customs processes do not mean looser scrutiny. Forwarders must invest in documentation accuracy, visibility tools, and partner alignment.

3) Prioritise partnerships over expansion for expansion's sake – Establishing owned offices in every market is rarely efficient. Strategic alliances within a trusted global network offer scalability without excessive risk.

4) increase visibility within the global logistics community – As shippers reassess suppliers and routes, being active in a recognised global network improves credibility, referral flow, and deal access.

Looking Ahead

The India–EU Trade and Investment Agreement and the India–US Bilateral Trade Pact mark a turning point in global trade. They will accelerate India's integration into Western supply chains and reshape how goods move between continents.

For logistics and freight forwarding companies, the opportunity is substantial – but so is the complexity. Those that operate in isolation will struggle to keep pace. Those embedded in strong global logistics networks will be better positioned to adapt, collaborate, and grow. In a world where trade is becoming both more connected and more regulated, success belongs to the well-networked.

Source: 4nextglobal.com

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WTO UPDATE

GOVERNMENT PROCUREMENT AGREEMENT THRESHOLDS UPDATED FOR 2026-2027

The WTO has published updated government procurement thresholds for individual parties to the Agreement on Government Procurement 2012 (GPA 2012) covering the period 2026-2027. Under the GPA 2012, companies from GPA parties may bid for certain public contracts in other GPA parties if the estimated value of the contract meets or exceeds the relevant threshold set out in each party's schedule. To date, updated thresholds have been received from Australia; Canada; the European Union; Hong Kong, China; Liechtenstein; Montenegro; the Kingdom of the Netherlands with respect to Aruba; Switzerland; and the United Kingdom. The updated values are now available through the e-GPA Gateway.

Thresholds expressed in each party's own currency are fixed for a two-year period. They are adjusted every two years to account for currency movements and ensure alignment with the Special Drawing Rights-based values established under the GPA 2012.

Background : The GPA 2012 is a plurilateral agreement that aims to open government procurement markets among its parties on a reciprocal basis and to the extent agreed between GPA parties. It also aims to make government procurement more transparent and to promote good governance.

The Agreement currently has 22 parties, covering 49 WTO members, including the European Union and its 27 member states (counted as one party). While open to all WTO members, it is binding only for those members that have acceded to it. The list of current GPA parties can be found here.

Reciprocal market opening assists GPA parties in purchasing goods and services that offer the best value for money. The Agreement provides legal guarantees of non-discrimination for the goods, services and suppliers of GPA parties in covered procurement activities, which are worth an estimated USD 1.7 trillion annually. Government procurement typically accounts for about 15 per cent of developed and developing economies' GDP.

WTO members explore ways to enhance transparency on trade and climate measures

WTO members took part in an interactive session of the Committee on Trade and Environment on 29 January to continue discussing how best to facilitate trade while navigating diverse carbon emissions measurement methodologies. Building on the fruitful discussions held in October and December on the importance of strengthening transparency in this area, members engaged in in-depth exchanges on concrete ways to improve transparency, including by considering ideas put forward in new proposals.

n his opening remarks, the Chair of the Committee, Ambassador Erwin Bollinger of Switzerland, noted members' active engagement in the first two interactive sessions and highlighted the strong interest in continuing discussions on approaches to enhanced transparency. Japan presented its revised proposal for a voluntary information-sharing template aimed at improving transparency in emissions measurement measures. Australia provided an illustrative example applying Japan's template to its new vehicle efficiency standards. China presented a proposal entitled "Suggestions for Advancing Concrete Discussions on Carbon Standards within the WTO."

Ambassador Sumathi Balakrishnan of Malaysia and Deputy Permanent Representative James Anderson of New Zealand - each in their personal capacity - joined Ambassador Bollinger in moderating the subsequent breakout group discussions.

All three breakout groups organized their discussions around a set of guiding questions, including how to effectively share additional information in the Committee without duplicating existing WTO notification obligations, the scope of information to be shared, and the possibility of piloting such voluntary information-sharing in the Committee in 2026. Members were also encouraged to consider the perspective of developing members in the process, as well as the linkages between increased transparency requirements and interoperability.

Reporting back on the group discussions, the three moderators noted that all members recognized the importance of enhanced transparency as essential to improving understanding of emerging trade and climate measures, enhancing predictability for business and other stakeholders, and supporting cooperation across diverse policy approaches. Many highlighted the role that the Committee could play in providing valuable information. The development dimension was also emphasized by many members.

While some members favoured an agreed template for the Committee (for instance, along the lines of Japan's template) that could be updated in light of experience, others preferred to keep a flexible approach. Some suggestions and comments were also offered on the format, content and process for applying the template for voluntary information-sharing.

In conclusion, Ambassador Bollinger thanked members for their dynamic and pragmatic engagement on enhancing transparency in the Committee. More reflection and work - possibly on the margins of the upcoming Committee meeting in February - will provide an opportunity to advance information sharing in the Committee.

Source: WTO Website

BRANCH NEWS

MUMBAI BRANCH

Public Sector Procurement & Supply Chain Innovation Awards -2025 : IIMM Mumbai Branch had organized National Summit on Public Procurement 8th Edition on 19th September 2025 at Hotel Holiday Inn , Mumbai (See MMR Issue December 2025)

As a part of above Conference ,one of the highlights was " Public Sector Procurement & Supply Chain Award Competition " After evaluation of 11Nos Entries by a Team of 4 Nos eminent Jury , the Prizes were announced for the Winner , Second Runner Up & First Runner up were announced on 19th September 2025 evening at the Venue of the Conference .

In order to further celebrate this event ,IIMM Mumbai Branch organized a dedicated Webinar (as a part of Knowledge Management Series) on 22nd January 2026 covering Presentation by Winners of this event

The Areas covered under Innovation Awards were :

- Digitalisation
- Process Simplification
- Enhanced Transparency
- Inclusive Procurement
- Vendor Evaluation
- Risk Mitigation
- Sustainability /ESG

The coverage and Scope was as under :

1) Procurement of Goods (Materials)
2) Procurement of Consultancy Services & Non - Consultancy Services
3) Procurement of Works Contracts
4) Vendor development/Management / Innovation
5) Warehouse & Inventory Management

The Rating Criteria consisted of the following :

1) Company Profile - Problem Statement
2) Originality and Innovativeness (Uniqueness of Solution)
3) Scalability & Repeatability
4) Measurable Impact (Time, Cost, Quality)
5) Sustainibility & Inclusivity
6) Alignment with Public Procurement Principles (Transparency, Equity, Efficiency)

The Jury were asked to give 5 points for each criteria. Max Score : 30

Averaged Scoring across all Jury Members . Total 11 nos Entries were received and evaluated

Jury Members consisted of :

1) Mr Joideep Roy Ex Executive Director & CPO (Marketing) , HPCL Mumbai
2) Mr K.P Kotwal Ex Head Procurement, L&T Hydrocarbon
3) Mr Girish Pai, Ex Procurement Leader Mazagon Docks Shipbuilders Ltd & G.M L&T
4) Mr Karthik Kumar Balan— Head, Supply Chain — Ultratech

The 2nd Runner Up :

- Mr Binumon .B Procurement Manager , CPO - BPCL Kochi Refinery

Topic : In House Development of the " Tender Document Creator Application "

- The 1st Runner Up : Mr Varun Sharma Central Estimation Cell (CEC) In-charge BPCL , CPO (Marketing)

  Topic : " System driven reduction of SLA time for Gas projects using Procurement Analytics "

  Winner : Mr Sandeep Kumar Singh, Dy Chief Materials Manager - Northern Railway

  Topic : " Strategic Development of Sub -Zero Climate Clothing Kits (- 20 degrees C) for Railway Personnel In Kashmir Valley.

CHHATRAPATI SAMBHAJINAGAR

The Advantage Maharashtra Expo 2026 (Maha Expo 2026) is a major industrial event was held from January 8–11, 2026, at the AURIC Exhibition Ground, Shendra MIDC, Chhatrapati Sambhajinagar (Aurangabad). Organized by MASSIA (Marathwada Association of Small Scale Industries and Agriculture)

Indian Institute of Materials Management, Chhatrapati Sambhajinagar (CSN) Branch actively serves as supporting partner to MASSIA to conduct this event successfully. The event features over 1,400-1,500 stalls, 100+ international exhibitors, and 3-4 lakh visitors focusing on manufacturing, engineering, and technology.

IIMM Chh. Sambhajinagar participated with an exclusive stall at this event. Overwhelming response to stall visits by industry and institutions is observed, inclusive of strong booking of IIMM Life memberships.

Executive committee members attended B2B vendor meets, seminars, workshops and various stall visits during the event. Efforts taken by Branch Executive committee were appreciated by MASSIA. Executive committee is also felicitated by Mr. Arjun Bhaulal Gaikwad, President MASSIA during the event.

National Council Members Mr.Sanjay Sanghai, Mr.Narendra Joshi, Mr.Srihari Kanthmani guided IIMM

team during event. Chairman Mr. Sushant Patare, Vice Chairman Mr.Shrikant Muley , Hon.Secretary Mr.Paras Mutha , 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, Mr.Chetan Borse, took efforts for conducting the event successfully.

KOLKATA BRANCH

Annual Picnic 2026 of IIMM, Kolkata : Indian Institute of Materials Management, Kolkata organized its Annual Picnic and get-together on **Sunday, 11th January 2026, from 10:00 A.M. onwards** at **"Jagadishpur Baganbari, Baruipur, Amtala Road,, South 24 Parganas, Pin – 743387.**

This year, the picnic spot was full of enjoyable to everybody in the natural environment. featuring the beautiful garden views, fun games for all age groups, and a variety of entertaining activities. We encouraged all members to join us with their families to make the most of this exciting day.

Near 96 participants which include faculty, staff members and members of the institute with their family. The programme began in the morning with a session of self-introduction by the students and faculty followed by a variety of party games. The games were Hit the wicket, Passing the Ball, Ball through for children.

Housie game was the last event, enjoyed by all the participants. Breakfast, lunch, tea along with some lip-smacking snacks were served during this day-long event. We arranged two luxury buses this year. Our Chairman, Hony Secretary, Hony, Treasurer and most of the EC members were also present in the picnic.

One Day Seminar : IIMM Kolkata organized a One-day Seminar on **"Enhancing Supply Chain Resilience Through Artificial Intelligence and Other Modern Applications."** on Saturday, 17th January 2026 from 9.30 AM onwards at Hotel Niharika, Kolkata

Concept Note: The modern global economy is increasingly interconnected and dynamic, making supply chains more vulnerable than ever to a range of disturbances. Further, in the "age of wars" the term "wars" refers to a changing and expanding nature of conflict.

Modern conflicts are no longer defined merely by physical mass and geographic lines. New forms of war can begin with a cyberattack on a power grid or with autonomous drones. The battlespace is no longer confined to traditional land, sea, and air but now includes cyber and information warfare. The ongoing Ukraine conflict, for example, demonstrated the critical role of disruptive technologies like drones and cyberattacks.

Thus, ensuring supply chain resilience —i.e., the ability to anticipate, prepare for, and respond to such disruptions —has become a critical focus for businesses seeking to maintain continuity and competitiveness. Among many innovative technical solutions, Artificial Intelligence (AI) is considered a promising approach for fostering resilient supply chains. AI presents a game-changing opportunity to improve supply chain resilience. AI technologies, including machine learning, predictive analytics, and the Internet of Things (IoT), support risk prediction, operational optimization, and accelerated recovery from disruptions.

By utilizing AI and other applications, businesses can enhance their decision-making procedures, obtain a better understanding of their supply chain operations, and preserve their competitive advantage in the face of uncertainty.

Key Technical Areas: The Seminar addressed three key sub-themes:

1. Age of Disruptions: The New Normal
2. SCM Resilience
3. Leveraging AI and other applications for SCM Resilience

The Chief Guest of the event was Shri Rakesh Ranjan, Additional Secretary, DVC. Shri PP Sengupta, formerly Executive Director, Coal India Ltd was felicitated for winning in the World Bank-supported Community of Practice Blog Competition 2025 on Public Procurement

A distinguished member Shri Subroto Ghosh, was felicitated as well. Branch Chairman Shri Animesh Chattopadhyay welcomed the Guests. Prof Rajib Kumar, National Council Member & Lead, Seminar & Strategic Alliances Committee introduced the theme of the seminar to the august gathering.

Veteran Industry Personality Amit Mukherjee, Senior Business leader with functional expertise in Technology & Supply Chain spoke on "Age of Disruptions: The New Normal" Sugata Haldar Erudite Consultant and Thought Leader-HR, Marketing, and Business Strategy, Ex-Head HR: Airtel; Ex-Country Head (HR): Century Ply engaged the audience with his views on "Implementing AI/Technology-Driven Supply Chain Resilience Strategy in the Age of Disruptions - The HR Factor"

Viraj Lal, CMLT Director, Supply Chain Management Risk Management/AI, Resilinc, UK mesmerized the audience with a discourse on "Agentic AI-driven Supply Chain Resilience." Prof Indranil Bose Vice President-Academics & Professor, Honourable Chancellor's office & School of Business and Economics, Adamas University, deliberated on "AI Innovations in Supply Chain: MSMes/ Startup Disruptions " based on his extensive research in the area.

Chandan Sengupta, a young AI Engineer, Cognizant Technologies; Ex- Amazon deliberated on "Building scalable AI-driven systems in the age of disruptions for accelerating digital transformation and unlocking new efficiencies in organizations." Jayanta Biswas, EC Member, wrapped up the seminar with a summary of the day-long deliberations, while Indranil Roy, Faculty Member of IIMM delivered the Vote of Thanks. The Seminar was a resounding success, thanks to the collective effort of the Seminar and Strategic Alliances Committee, EC Members, IIMM Students and Staffers.

BANGALORE BRANCH

23.01.2026 -IIMM Bangalore Branch Inaugurates Newly Renovated Office & Holds Business Plan for 2026–2027: The Indian Institute of Materials Management (IIMM), Bangalore Branch, marked a significant milestone with the **Inaugural Function of its Newly Renovated Branch Office**, including the upgraded Meeting Hall and Classroom/Library, on **Friday, 23rd January 2026**.

The program commenced with a sacred **Mahaganapathi and Lakshmi-Narayana (Sathyanarayana) Pooja** from 4.30 pm to 5.15 pm, performed by the Office Bearers and team members, invoking divine blessings for the continued growth and success of the Institute.

The formal inaugural function began at 5.30 pm, followed by **Maha Mangalarathi** at 5.45 pm, creating a spiritually uplifting atmosphere.

Distinguished Dignitaries

The inauguration was graced by eminent leaders of IIMM:

- **Mr. P. M. Biddappa**, National President, IIMM
- **Dr. P. Sengottaiyan**, Vice President (South), IIMM

The occasion was further honored by the presence of the Guest of Honour:

- **Mr. S. B. Lovekar**, Adviser, Educational Committee, IIMM

The Chief Guests formally inaugurated the renovated premises and appreciated the efforts of the Bangalore Branch in strengthening infrastructure to support professional development, knowledge sharing, and member engagement. Following the inaugural ceremony,

members enjoyed fellowship over light refreshments and tea.

Business Plan 2026–2027: At 6.15 pm, the **Executive Committee Meeting cum Business Plan Meeting for 2026–2027** was convened. The session focused on strategic initiatives, academic and professional programs, membership development, industry engagement, and strengthening student chapters.

During the meeting, **Mr. S. B. Lovekar** addressed the gathering and shared valuable insights on educational initiatives and future-oriented activities to enhance the Institute's impact and outreach.

The Chairman, **Mr. C. S. Karunakar**, expressed gratitude to the dignitaries, members, and organizing team for their support and participation. The event concluded on a positive and forward-looking note, reaffirming the Bangalore Branch's commitment to excellence and growth in the coming year.

04.02.2026 -IIMM Bangalore Branch Meeting with SJIM – Strengthening Academic & Industry Collaboration: An Institutional visit and meeting was held on **4th February 2026** at **St. Joseph's Institute of Management (SJIM)** to discuss ongoing and future collaborative initiatives between SJIM and the Indian Institute of Materials Management (IIMM), Bangalore Branch.

Discussion Highlights: The meeting focused on strengthening and continuing the collaboration between SJIM and IIMM. Key areas discussed included:

- Continuation of the existing **SCM Analytics Course**, with suitable modifications to enhance industry relevance.
- Introduction of **Digital Sourcing with MSMEs** as a joint academic and industry-oriented initiative.
- Launch of industry-focused short-term programs in Supply Chain Management, including:
  - AI in SCM
  - International Trade
  - Management Development Programs (MDPs) and workshops
- Exploration of joint programs involving SJIM, IIMM, and Indian Institute of Science (IISc).
- Utilization of SJIM's infrastructure, including conference hall facilities, for workshops and seminars.

Conclusion : The discussions were highly productive and forward-looking. It was agreed that IIMM will undertake internal and technical-level deliberations to evaluate the proposals in detail and take a final decision regarding the continuation and implementation of the collaborative initiatives. The meeting reaffirmed the shared commitment of SJIM and IIMM towards promoting industry-aligned education and professional development in Supply Chain Management.

06.02.206 -Industry Visit: An industry visit was made to Sineng Electric India Pvt. Ltd. On 6th February 2026 by Mr. Nagaraj S. M. and Mr. G. Balasubramanian, coordinated through the support of Mr. M. C. Lokesh. During the visit, detailed discussions were held with the company representatives regarding their requirements for training programs and consultancy services in both offline and online modes. The organization expressed keen interest in professional support in key areas such as Warehouse Management, Stores Management, Procurement Management, International Trade, Kanban Systems, and customized programs in Materials Management and Supply Chain Management. The company emphasized the need for a tailored approach aligned with their operational requirements and industry best practices. The interaction was highly positive and reflected strong potential for collaborative engagement.

12.02.2026 -In-House Training Program : The IIMM Bangalore Branch successfully conducted an in-house training program for the executives of Deutsch India Power Connectors Pvt. Ltd.. The session saw enthusiastic participation from around 20 executives representing diverse functional areas of the organization. The program was delivered by one of IIMM's senior faculty members, who provided deep insights supported by practical industry examples and interactive discussions. The training focused on strengthening core competencies and enhancing operational effectiveness in materials and supply chain functions. Participants actively engaged throughout the session, making it highly interactive and outcome-oriented. The program received excellent feedback from the management and participants, who appreciated the practical relevance, clarity of delivery, and value addition to their professional roles.

16–19 February 2026 – In-House Training Program: The Indian Institute of Materials Management – Bangalore Branch successfully conducted a four-day In-House Training Program on Supply Chain Management for employees of Hindalco Industries Ltd. from 16th to 19th February 2026.

The program commenced with an enthusiastic response and active participation from around 25 employees representing various divisions of the organization. Senior faculty Mr. Murugesan initiated the sessions, delivering expert insights on International Trade. From 18th February, Mr. Rajendran K.P. and Dr. Rabi Narayan Padi conducted sessions covering the remaining modules of Supply Chain Management. The program was designed to provide practical insights and contemporary knowledge in supply chain operations, procurement, logistics, and global trade practices. The initiative received excellent feedback from the organization, reflecting its value and relevance to the participants.

21.02.2026 -Workshop on "Cost Reduction in Efficient Procurement" – Bangalore : The Indian Institute of Materials Management – Bangalore Branch ha organised the workshop on **"Cost Reduction in Efficient Procurement"** and was successfully conducted on **21st February 2026 at Paraag Hotel, Bangalore**. The session began with a warm welcome and introduction by **Mr. C. S. Subhash, EC Member**. Around 30 participants from diverse sectors attended and actively engaged in the program. The workshop was delivered by senior faculty **Mr. M. S. Shankar Narayanan, Mr. G. Ganesh Kumar, and Mr. Vishwanath Moslay**, combining practical insights with engaging presentation styles. The sessions were highly interactive and infused with humour, keeping participants attentive even after lunch. The program received **excellent feedback** from attendees, who appreciated the relevance, style, and professional delivery of all faculty members.

ALWAR BRANCH

Dr. Vijay Kumar Meena Senior Principal Scientist , CSIR - Central Scientific Instrument Organisation, Ministry of Science and Technology, Government of India, Developed Patient Specific Inplants 1st time in India. It will reduce the dependence on foreign countries for supply of these implants. The research and Development by Dr. Vijay will provide the treatment to Indian public at very economical price. The implants has been tested successfully on number of patients and commercial production has started in India. Dr. Vijay Kumar Meena is the 1st Scientist in india who has done on patient specific implants."Dr. Vijay Kumar Meena is also the founder life member of IIMM Alwar Branch and son of Mr. Lalit Raj Meena, Immediate Past President IIMM India.

IIMM Alwar branch has decided to celebrate it annual day on 30th April 2026.The theme of the program is " Impact of artificial intelligence on Indian industries , Specific reference to supply chain management. All members are invited to attend the program on 30th April 2026 at Hotel lemon tree , Shanti Kunj Alwar . The program will start at 6:30 p.m. followed by dinner "Eminent speakers from Industris and public sector will be delivering the talk " Lalit Raj Meena founder Chairman and former national president IIMM.

अब भारत में बनेंगे उन्नत 3डी प्रिंटेड इम्प्लांट, विदेश की निर्भरता होगी खत्म

CHANDIGARH BRANCH

Indian Institute of Materials Management, Chandigarh branch organised the following activities during February 2026.

1. 13.2.26 "Pleased to share a meeting with Mr B.B.Singal President Haryana State Pharmacy Council to have programs with collaboration of HSPC and IIMM for sharpening the skills of Phamacists in Supply Chain ànd logistics Management. Branch was represented by S.K.Sharma Former National President IIMM and Mr V.S.Maniam veteran and Former Chairman IIMM Chandigarh branch. Useful discussions took place to start short duration courses shortly.

2. 14.2.26. In order to improve visibility of IIMM and it's services, Mr S. K.Sharma Former National President and Mr V.S.Maniam Former Chairman Chandigarh branch visited Bharat Electronics limited Panchkula (BEL) and had a meeting with Mr Pankaj Singhal Sr DGM and Head Materials Management, Dy GM Purchase, Dy GM Stores and Manager HR and apprised about education programs, training and consultancy and advantages of Membership. The response was encouraging.

In continuation of the factory visit drive, Mr S.K. Sharma Former National President,", Mr Kiran Rampal Chairman Chandigarh branch, Mr Rajesh Gupta NC Chandigarh branch visited M/s Aerial Telecom Service Ltd (ATS Ltd) . ATS is in service sector and have app. 11000 employees on its roll and warehouses across the country.Had a meeting with Mr Sham Kumar one of the director ànd head of Supply Chain. Mr Sham Kumar enrolled as Life member and the kit was handed over to him. We shared IIMM services to him and he assured participation of his team in education and training programs.

4. 19.2.26"Pleased to share that the first executive Development program on Effective and efficient Modern Warehouse/ Stores Management was organised at the newly developed training centre of IIMM Chandigarh office. Mr S.K Sharma, O.P.Longia and V.S."Maniam was faculty. Participants from Triputi health care and Pharma,Paonta Sahib,Poly plastics, Yamuna Nagar, Amber Industries, Rajpura, Sanctus Pharma, Baddi, Amba Traders Chandigarh etc participated. Basic functions of Warehouse, WMS, Smart and manless materials handling and storage and ESG were few topics part of training. The response was encouraging.

IIMM **Research Centre**

CENTRE FOR RESEARCH IN MATERIALS MANAGEMENT (CRIMM)

CRIMM is a Joint Venture between IIMM and Techno India University, Kolkata, West Bengal (WB). Techno India University is one of the renowned and largest Private University in West Bengal. A MOU was singed with TIU on 17 of November 2017 for a period of 4 years which was further renewed for 4 years period in April 2022. The current MOU is valid till April 2026.

Following are the objectives and activities of CRIMM:

- To promote research in Material Management (MM) discipline.
- To collaborate with industry for furthering the academic advancement of materials management and its application to Industry
- To render assistance to industries in problem solving projects, develop. Activities, etc.
- To take up project consultancy work in MM. Centre will act as a nodal point to coordination & integration of research information in the field of MM for ongoing & completed research work in other countries.

Eligibility for Research Fellowship:

- Candidates should have master's degree in any subject / discipline or equivalent professional management qualification i.e. PGDBM, DGDMM etc. with at least 50% marks in aggregate at the graduate and post-graduate level.
- The candidate should have experience in working in MM discipline or allied areas in Industries. In case of highly experienced candidate in the field of MM, and /or Engineering Graduates, Mater Degree may be dispensed with.
- Preference will be given to Industries sponsored candidates.
- Successful Research Fellow from CRIMM shall have the unique opportunity to pursue PhD in Techno India University, West Bengal with condensed course work.

Governing Committee:

A steering committee has been constituted to oversee the work of the centre consisting of nineteen members, eight each from Techno India University, West Bengal, IIMM and three from Industry. The current Board of Governor (BOG) consists of following members:

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

Nominated by Techno India

1) Prof. (Dr) Goutam Sengupta, Rector TIU, WB – **Jt. Chairman**
2) Prof. (Dr) Debashis Chaudhuri, Dean (Engg, Proj., Student affairs.
3) Prof. (Dr) S N Roy, Adjunct faculty
4) Prof. (Dr) Tripti Chakrabarti, Dean Basic Sciences
5) Prof. Asoke Kumar Paul, Associate Professor
6) Prof. (Dr.) Debabrata Bhattacharya, Professor
7) Mr. Soumitra Bhowmick, Vice President and CFO
8) Dr. Paramita Sen, Assistant Professor, Rector's Office

Advisors:1) Mr. Asok Dasgupta 2) Dr. PK Dey, Professor, Aston Business School, UK 3) Prof. (Dr) Gautam Majumder, Pro Vice Chancellor, TIU

Fees details related to CRIMM Fellowship:

1. Rs 5,000 along with application form for registration.
2. Rs 5,000 for Research Methodology course
3. Rs 15,000 within six months of date of registration or approval of preliminary synopsis is, whichever is earlier.
4. Rs 15,000, within one year of date of registration or approval of preliminary synopsis, whichever is earlier?
5. Rs 20,000 on approval of the final report by Governing committee of CRIMM.
6. Thus the total fees payable for the program is Rs.60,000.
7. Failure to pay the fees as per above schedule will make the registration liable for cancellation. In such cases, if the candidate wishes to bear-registered he has to pay all the fees afresh.

How IIMM Can Benefit out of CRIMM: Since CRIMM is a stand along entity with its own financials, IIMM does not directly benefit out of CRIMM finances. However IIMM can draw the following benefits from CRIMM:

1.) CRIMM fellowship students can be prospective candidates for Life Membership of IIMM in case they are nonmembers.

2.) In prospects for IIMM PG courses, we can have a special mention regarding CRIMM. This can be an enabling factor for prospective PG students to take up our courses.

BOG meeting of CRIMM is scheduled in Kolkatta Techno University Campus on 27 March 26 where broad contour for various CRIMM activities for next 2 years will be discussed.

For more information please contact

MALAY C MAZUMDAR, Jt. Chairman – CRIMM

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

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