AI and API self-reliance re-engineer our pharma value chain

Four interconnected pillars are reflecting a fundamental re-architecting of the Indian Pharma Value Chain



Image By AI-Assistance

The Indian pharma industry is at a turning point in history. For years, we've been proudly known as the "pharmacy of the world", providing some 20% of the world's generic drugs. However, this impressive volume hides a structural weakness: heavy reliance on imports, especially from China, for Active Pharmaceutical Ingredients (APIs). In fiscal year 2024-25, India imported 200 categories of APIs valued at $4.35 billion, of which almost 74% originated from China.

This reliance was starkly revealed in the wake of the global pandemic, COVID-19, and further amplified by recurring geopolitical twists and conflicts, making API self-reliance an economic necessity rather than a policy goal. But the process underway is more than import substitution. It is a fundamental re-architecting of the Indian Pharma Value Chain, reflected in four interconnected pillars: AI, APIs, Agility, and Autonomy.

The API imperative: from dependency to self-reliance

The Government of India has shown unprecedented ambition in its policies. With a budget outlay of ₹6,940 crore, the Production Linked Incentive (PLI) Scheme for Bulk Drugs is designed to incentivise local production of 41 identified critical products and create a self-reliant industry.

The results are tangible. Of the 48 Greenfield projects, committed investment is ₹4,329.95 crore, while actual investment is ₹4,814.1 crore as of December 2025. Some 38 projects have been commissioned with 56,800 MT per annum capacity in the country. The scheme has cumulatively achieved sales worth ₹2,720 crore, out of which exports are worth ₹527.96 crore.

Some of the important products being manufactured are Penicillin G, 7-ACA, Clavulanic Acid, Erythromycin, Atorvastatin and Diclofenac Sodium. This was echoed in the Union Budget 2026, which introduced the Biopharma SHAKTI initiative of ₹10,000 crore to boost India's biopharmaceutical ecosystem. The PRIP scheme outlay is about ₹5,000 crore, with a vision to shift the sector from cost-based growth to innovation-based growth, with support of ₹700 crore to be provided to seven Centres of Excellence.

The AI Revolution: Intelligence Embedded in Every Link

APIs are the 'what' of India's pharma transformation, and AI is the 'how'. The Economic Survey 2025-26 makes it clear that to scale up, new advanced manufacturing technologies like AI should be adopted.

AI has been adopted across the entire value chain in 2026. Since July 2025, Mankind Pharma has integrated customised GPTs throughout its organisation to boost sales and marketing, demand planning, procurement and commercial operations. The new GPT-driven dashboards now offer real-time, data-driven insights into R&D, supply chain and commercial operations. The company is applying OpenAI's GPT-5 model across field force enablement, digital marketing, R&D, manufacturing, and medical affairs.

Agility: from cost optimisation to continuity planning

The third pillar Agility represents a profound shift in mind-set. For many years, the Indian pharma value chain has been optimised for cost efficiency and has operated on a lean, just-in-time principle. That era is over.

Geopolitical uncertainties such as rerouting around the Red Sea and the Strait of Hormuz have caused delivery delays and increased logistics costs. The industry has responded strongly. Beyond "lowest cost" optimisation, businesses are shifting to a balance of supply continuity, resilience and predictability, alongside efficiency.

The question is no longer "How lean can we operate?" but "How prepared are we for the next disruption?"

The PLI scheme is built on the premise of reducing the risk of supply disruption caused by overreliance on any single source. Companies are building up stocks, spreading their suppliers, and monitoring them using indicators such as on-time delivery. Supply chain resilience has become a competitive advantage.

Autonomy: building strategic independence

Autonomy is the strategic objective that ties the other three together. It symbolises India's ability to choose what to produce in the country and what to do when things go haywire, without being swayed by outside influences.

The Economic Survey 2025-26 is apt in this regard: India's pharmaceutical industry is moving from volume-driven to value-driven, with a focus on complex generics, biosimilars, and innovation. India exports pharmaceuticals worth 3% (11th position) of the world's pharmaceutical exports by value. The domestic market is projected to grow to $120-$130 billion by 2030, up from $55-$66 billion in 2025.

More than half of India's pharmaceutical exports are geared toward highly regulated markets like the USA and Europe. The sector's annual turnover in FY25 was ₹4.72 lakh crore, and exports have grown at a 7% CAGR over the past 10 years.

The talent & university imperative

None of this would be possible without the right talent. Under the Bulk Drugs scheme, the PLI schemes have created 4,896 jobs, and under the Pharmaceuticals scheme, they have created 1, 13,300 jobs. However, the Indian pharma sector faces a dilemma today: it has many talented academics but a shortage of job-ready professionals every year.

Universities must move beyond traditional curricula to integrate:

- API Manufacturing (chemical synthesis and fermentation-based processes).
- Quality Systems (GMP, regulatory compliance, and quality assurance).
- Supply Chain Management (resilience, digital tools, and AI-driven optimisation).
- Hands-on industry exposure through internships and live projects.

Certain activities, such as the seven Centres of Excellence developed by PRIP and PAGE Institute, are pioneering but are not widespread. The Telangana Council of Higher Education has entered into a MoU with Bulk Drug Manufacturers Association to address the gap between academia and industry in the state, which needs to be replicated across the country.

The Indian pharmaceutical industry is being fundamentally re-architected. The four pillars AI (intelligence), APIs (manufacturing foundation). Agility (operational mindset), and Autonomy (strategic purpose) are each part of a single vision.

Policy momentum is strong: the PLI scheme has already garnered Rs 4814 crore in investments and created capacity of 56800 MT, while industry is increasingly adopting AI and setting the benchmark for introducing intelligence across the value chain. However, the bottleneck issue is talent.

The changing paradigm is from volume to value, as highlighted in the Economic Survey 2025-26, Winners will be those who combine discovery, AI-driven intelligence, and manufacturing on disciplined platforms.

India is at a critical juncture. TheA3+1 transformation can – with appropriate policies, technology and – most importantly – the right people – make India not only the world's pharmacy, but a world-class innovation and execution place. They're laying the foundations. We need to take this step forward with the urgency and ambition of this moment; the question is whether we will.



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