



REVOLUTIONIZING LOGISTICS: Tech Start-ups Chart New Course for Success

The logistics industry is undergoing a major transformation, driven by advancements in technology. From self-driving vehicles to blockchain, traditional supply chain practices are being revolutionized by innovative start-ups. In this article, we'll explore how tech-powered logistics start-up companies are reshaping the way goods are transported, managed, and delivered. Insights from industry leaders from budding start-ups will reveal the challenges, opportunities, and cutting-edge technologies driving the evolution of logistics.

➤ Karvi Rana

The age of technological innovation has completely transformed global operations. It has deeply influenced every known industry, driving their rapid evolution. From manufacturing to finance, healthcare to retail, virtually every sector has been impacted by the disruptive power of technology, leading to unprecedented levels of change and progress.

The logistics sector has also felt the effects of this technological revolution, streamlining processes and enhancing efficiency through automation. Traditional manual and paper-based systems are being quickly replaced by automated solutions powered by cutting-edge technologies like artificial intelligence, the Internet of Things (IoT), and blockchain. These technologies not only streamline operations but also optimize resource utilization, reduce costs, and enhance overall efficiency.

The rise of new-age start-ups fuelled by technological innovation has accelerated this transformation.

Published by Nasscom, along with global management and strategy consulting company Zinnov, a report titled 'The Indian Tech Start-Up Landscape Report 2023' revealed that supply chain management and logistics (11%) are among the top sectors adopting deep technology enterprises, with other sectors including tech (23%), BFSI (17%), and health tech (9%).

Start-ups Fuelling Technological Innovation

New-age start-ups are leveraging the latest advancements in technology to address emerging challenges and opportunities in the logistics space. By embracing principles of agility, customer-centricity, and continuous

innovation, they are able to disrupt traditional business models and drive meaningful change within the industry.

"Tech start-ups are propelling supply chain digitalization through technologies like blockchain, IoT, AI, automation, and predictive analytics, thereby pushing the innovation curve. Technological breakthroughs and automation are at the heart of tech-enabled start-ups," said Kartik Jalan, Founder and CEO of Indicol.

Tech-enabled start-ups are driving the digitalization of supply chains by introducing innovative solutions that enhance visibility, efficiency, resilience, and sustainability across the entire value chain. "By integrating state-of-the-art technologies into the very fabric of supply chain operations, start-ups are empowered to thrive in an increasingly digital and interconnected world," he added.

Constantly seeking to gain a competitive edge



“Carbon off-setting solutions help start-ups and giants alike choose greener ways of shipping and reduce their overall carbon footprint. Also, technology makes discoverability easier and leads to an overall increase in the capacity fill rate, ultimately reducing the carbon footprint.”

RAGHAV RADHAKRISHNAN
Product Head at Elyxr



in a fast-paced business landscape, tech-enabled start-ups are leveraging technologies like machine learning, artificial intelligence (AI), the Internet of Things (IoT), advanced analytics, 3D printing, workflow automation, self-driving vehicles, drones, etc. to revolutionize the logistics industry.

Pratik Sharma, Co-Founder & COO, Automaxis

shares with us the technology he used in his start-up to further digitalize the industry.

He shares, “We are working on two cutting-edge technologies, to name them AI and blockchain. AI algorithms, used by automaxis to analyze vast amounts of supply chain data, identify opportunities for cost reduction and efficiency improvement. These technologies enable proactive decision-making, predictive maintenance, and real-time optimization in logistics operations, customs declarations, and other supply chain-confined transactions.

Blockchain technology is employed by automaxis to enhance transparency, traceability, and trust in supply chain transactions. Blockchain enables secure and transparent record-keeping, seamless cross-border payments, and streamlined handling of the eBL.”

Sharing that tech-enabled, intelligent, and innovative solutions used lead to environment-controlled and efficient logistics, Jalan says, “We have adopted a holistic approach to demand and supply to provide service at par with global standards. Tools like predictive analytics, refining route planning, and





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inventory management are being employed to enhance efficiency, reduce lead times, and ensure customer satisfaction. Technological breakthroughs and sustainability are at the heart of Indicol. This aligns with global trends and reflects our commitment to reducing the carbon footprint. We are leveraging these evolved technologies to set benchmarks in deep tech, AI, ML, and automation in the cold chain universally.”

By anchoring to the numerous advanced technologies available, start-ups are very much contributing to revolutionizing traditional logistics with enhanced visibility, efficiency, and reliability across the supply chain, enabling businesses to adapt to changing market conditions, meet customer demands, and gain a competitive edge in the global marketplace.

Improving Efficiency and Reducing Cost

Technology-driven start-ups are transforming logistics operations in disruptive ways by adopting cutting-edge solutions to optimize efficiency and streamline processes.

While AI is being employed to automate repetitive and time-consuming tasks, enhancing

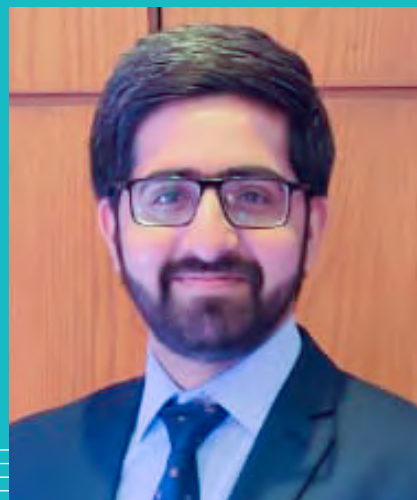
accuracy and productivity, ML algorithms analyze vast amounts of data to identify patterns and make predictions, enabling more efficient route planning, inventory management, and demand forecasting. On the other hand, Blockchain technology ensures secure and transparent transactions, facilitating seamless collaboration among stakeholders and reducing inefficiencies caused by paperwork. Also, with IoT, logistics providers can gain a comprehensive understanding of their operations, identify bottlenecks, and make informed decisions to enhance overall efficiency.

The integration of these cutting-edge technologies is leading to significant benefits for logistics companies - reduced costs, improved customer satisfaction, increased operational agility, and enhanced sustainability.

“Technology has been a transformative force in enhancing the efficiency and speed of our logistics operations. Embracing digital solutions has streamlined distribution processes, significantly reducing manual errors and expediting the movement of goods,” said Anshul Mahindru, Co-Founder of Paapos.

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The introduction of automation technologies, such as robotics and drones, enables start-ups to automate repetitive tasks, accelerate order fulfilment, and increase throughput in warehouses and distribution centers.

“Repetitive online tasks like filing various documents across portals have been automated with RPA, as the steps are exactly the same every time. API integrations with liners and other portals enable direct procurement of spot rates and filing of documents like AMS,” shares **Raghav Radhakrishnan, Product Head at Elyxr.**

“When it comes to the generation of documents, OCR automatically fills in the data based on master documents and avoids manual errors. All this unlocks precious bandwidth that can be channeled to more important tasks,” he adds.

Additionally, real-time tracking and monitoring systems provide greater visibility into supply chain activities, enabling start-ups to proactively identify and address bottlenecks, optimize workflows, and respond swiftly to changing demand patterns.

“Technology has also enabled us to provide

faster resolutions to our customers in case of any disputes because we can maintain proper timelines for replies and everyone in the team, from top management to customer support, is aware of the same. We have also implemented technology so that customs clearance is done faster, and if there are any issues, they are reflected to the customer in real time,” Mahindru said.

Along with this, they are also enabling cost reductions in overall logistics operations.

“Traditional procurement strategies often focus on squeezing transporters, but the true value lies in creating network efficiency through data and technology. Many existing technology solutions offer generic procurement capabilities, lacking specificity for rate and contract complexities. To address this, innovative start-ups have developed tailored solutions that can handle varying freight contract structures and strategies,” said **Vikas Singh, Co-Founder & COO of FreightFox.**

By implementing advanced technology, start-ups are not only saving on man hours but also on costs.



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VIKAS SINGH
Co-Founder & COO of **FreightFox**

Explaining the same, Mahindru shares, “The shift to digital solutions has significantly minimized paperwork, expedited reconciliation processes, and reduced associated costs. Data-driven decision-making has emerged as a cornerstone of our operations, allowing for faster and more informed choices. Moreover, the enhanced security measures in our digital systems not only safeguard against potential mishaps but also contribute to long-term cost savings.”

Overall, technology-enabled start-ups are playing a pivotal role in transforming logistics operations, driving efficiency gains, saving costs, and delivering faster, more responsive services to customers.

Transitioning Towards Greener Logistics

Tech-enabled start-ups are revolutionizing green logistics by introducing innovative solutions that prioritize environmental sustainability.

Singh shares “Start-ups leverage technology to drive sustainability in logistics by establishing trip-level footprints, which serve as the foundation for sustainability efforts, enabling enterprises to move from aggregate-based

emission accounting to a more granular and actionable energy-based approach.

With the right visibility, organizations can identify opportunities to transition to alternative energy sources, such as electrification or CNG vehicles, promoting eco-friendly practices across the supply chain.”

Leveraging advanced algorithms and data analytics, tech-enabled start-ups optimize delivery routes to minimize fuel consumption and emissions while also developing electric, hybrid, and alternative fuel vehicles for more eco-friendly transportation.

Sharing the use case of route optimization in enabling greener operations, Radhakrishnan points out, “Due to route optimization solutions, regular milk runs and beat planning are highly efficient. The same can be extended to lane optimizations in ocean freight. Carbon off-setting solutions help start-ups and giants alike choose greener ways of shipping and reduce their overall carbon footprint. Also, technology makes discoverability easier and leads to an overall increase in the capacity fill rate, ultimately reducing the carbon footprint.”

“ Numerous emerging technologies are poised to shape the trajectory of logistics, warehousing, and supply chain management in India. start-ups are actively gearing up to integrate these innovations into their daily operations, aiming to yield substantial cost savings and operational efficiencies.”

ARUN PANDIT
Co-Founder of **Hyphen SCS**



Additionally, start-ups now implement smart warehousing systems equipped with IoT sensors and automation technologies that can reduce energy usage, optimize inventory management, and minimize waste.

By innovating in reverse logistics processes, providing supply chain transparency through blockchain, creating collaborative logistics platforms, and offering carbon offsetting services and emissions tracking tools, these new-age tech start-ups are driving the transition towards greener and more sustainable logistics practices, contributing to global efforts to combat climate change and build a more environmentally conscious supply chain ecosystem.

Hiccups During Revolutionization

While these new-age start-ups have been fuelling digitalization in the nation, where traditional logistics operations have been the norm, and bringing in a plethora of advantages, the introduction of technology with the advent of these start-ups in legacy logistics and supply chain operations is not without its challenges.

Mahindru explains, “The logistics industry,

primarily governed by decision-makers in their late 40s, posed a challenge in fostering a mindset shift toward technology adoption. Overcoming these challenges involved strategic planning, comprehensive training programs, and the younger generation stepping up to demonstrate how technology could reshape logistics practices.

As a company, we hire the best people from a technology background who also understand freight and logistics. Since it involves a lot of parties to implement this change, it is very important to have continuous brainstorming and a strategic approach to convince everyone how technology can make things easier, not just for the customer but for the service provider as well. A holistic approach, along with creating awareness among the customer as to how they can leverage the technology to get ahead in business, gave us a competitive edge as well as made us a part of transforming new-age logistics.”

India often adopts off-the-shelf solutions that don't quite fit our complex landscape. This mismatch complicates the inherent complexity of implementing technology, hindering seamless adoption.



Sharing a critical concern in this revolutionizing journey, Singh places emphasis on the incongruence between technological solutions and entrenched legacy culture, along with antiquated processes and a myopic focus on short-term gains.

He also shares that data integrity emerges as a critical concern. "Discrepancies in data accuracy abound, complicating efforts to leverage data for analytics and decision-making. Addressing this challenge necessitates robust measures deploying AI and ML technologies to automatically correct and standardize data, ensuring reliability, repeatability, and consistency.

Despite the deployment of the best technologies, sustained commitment from the leadership is key. Overcoming these challenges demands a comprehensive approach that fosters innovation and cultivates a collaborative ecosystem for technological advancement," he said.

To overcome these challenges, tech-enabled start-ups must navigate effectively; they

must undergo a process of unlearning and relearning industry norms, cultural dynamics, and leadership qualities. Similarly, start-ups undergoing transformation must be mindful of their current digital maturity and understand the impact of these solutions on different roles within the supply chain organization.

Looking Beyond

The Nasscom Report revealed that the number of total start-ups in the country went up to 31,000, bringing the total funding to more than USD 70 billion. Moving ahead, Indian tech start-ups are expected to further their upward trajectory. Speaking of the logistics industry, tech start-ups are expected to see the adoption of emerging technologies shaping the future of logistics and supply chain management.

Arun Pandit, Co-Founder of Hyphen SCS shares, "Numerous emerging technologies are poised to shape the trajectory of logistics, warehousing, and supply chain management in India. start-ups are actively gearing up to integrate these innovations into their daily operations, aiming to yield substantial cost savings and operational efficiencies."



“Start-ups in the logistics and supply chain industry are embracing emerging technologies as opportunities to innovate, differentiate, and drive value for their customers, positioning themselves for success in the rapidly evolving digital landscape.”

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He adds that these technologies encompass a blend of hardware and software enhancements. Notable among them are:

Autonomous Vehicles

Autonomous trucks and robotic delivery vehicles have immense potential to transform transportation and last-mile delivery, offering a solution to the pressing issue of driver shortages nationwide. Despite being in nascent stages, start-ups are investing in research and development to enhance the capabilities of these autonomous systems, tackling challenges such as navigation, safety, and regulatory compliance.

Electric Vehicles

Electric vehicles (EVs) are making significant strides in the commercial and supply chain sectors, offering eco-friendly, cost-effective, and tax-efficient solutions. Start-ups like Altigreen, 3 EVI, Log9 Materials, Magenta, Cygni Energy, Zypp Electric, Euler, and EVRE are focusing on commercial and supply chain solutions, driving the adoption of EVs in the logistics industry.

Drones

Drone-based deliveries have the potential to

revolutionize the logistics and transportation industry in India, offering benefits in terms of efficiency, accessibility, cost-effectiveness, and sustainability. However, regulatory challenges and safety concerns need to be addressed. Key start-ups in this space include SKye Air, Red Wing, and TechEagle, which provide drone-based delivery services and last-mile logistics solutions.

Artificial Intelligence and Machine Learning

AI and ML algorithms enable predictive analytics, demand forecasting, route optimization, and dynamic pricing in logistics. Start-ups like Locus, Far Eye, LogiNext, Blackbuck, Elasticrun, Delhivery, and Shiprocket are leveraging AI and ML technologies to automate decision-making processes, optimize supply chain operations, and enhance efficiency.

Robotics and Automation

Robotics and automation technologies are streamlining warehouse operations with robotic pickers, packers, and palletizers. Start-ups like GreyOrange, Adverb, Falcon Auto Tech, Unbox Robotics, and Accio Robotics are developing innovative solutions to reduce labor costs and enhance warehouse productivity.

Blockchain and Distributed Ledger Technology

Blockchain technology ensures secure and transparent tracking of goods across the supply chain, enhancing traceability and authenticity. Although India has yet to see significant dedicated start-ups in this space, start-ups globally like Roadlaunch, Cargo Coin, Bonafi, and QUASA focus on traceability, transparency, and authenticity in supply chains.

Internet of Things (IoT)

IoT devices and sensors enable real-time monitoring of inventory, equipment, and vehicles, improving asset utilization and operational efficiency. Start-ups like Fleetx, Netradyne, and Light metrics integrate IoT technologies into their logistics solutions to enhance asset tracking and supply chain visibility.

Augmented reality (AR) and virtual reality (VR)

AR and VR technologies enhance warehouse operations, training, and remote assistance, improving worker productivity and safety. While India has limited start-ups in this space, global examples like GetVu and Augmented Pixels demonstrate the potential for AR and VR in logistics environments.

3D Printing

3D printing technology enables on-demand production of customized products and spare parts, reducing lead times and inventory costs. Indian start-ups like Nexa 3d, Think 3d, STPL3D, and 3Dexter explore 3D printing for localized manufacturing, optimizing supply chains.

Edge Computing

Edge computing facilitates real-time data processing and analysis at the network edge,

enabling faster decision-making and reducing latency in IoT applications. While start-ups may not explicitly market themselves as edge computing companies, Roambee provides supply chain visibility and intelligence, leveraging edge computing to optimize operations.

In embracing these emerging technologies, start-ups in the logistics and supply chain management space position themselves to address evolving customer demands, enhance operational efficiency, and gain a competitive edge in an increasingly digital and interconnected world.

“Start-ups in the logistics and supply chain industries are embracing emerging technologies as opportunities to innovate, differentiate, and drive value for their customers, positioning themselves for success in the rapidly evolving digital landscape. Digital twins is one great technology for the supply chain industry, which will impact in many ways as far as managing different things is concerned,” Sharma said.

By harnessing these technologies and innovation, start-ups are expected to tackle gaps in supply chain visibility, transparency, and traceability in the future.

“This may involve deploying solutions like IoT sensors for live tracking, blockchain for transparent and unalterable record-keeping, AI/ML for predictive analytics, and cloud-based platforms for seamless data sharing and collaboration. Through these efforts, start-ups can enhance insight into supply chain operations, foster transparency among stakeholders, and bolster product traceability from origin to delivery,” Jalan said.

Explaining in detail, Sharma said that start-ups can take advantage of IoT devices, such as sensors, RFID tags, and GPS trackers, to track and monitor goods, assets, and vehicles throughout the supply chain. He also added that

- start-ups can enhance traceability, authenticity, and trust in supply chain operations, reducing the risk of counterfeit products and unauthorized modifications.
- start-ups can leverage data analytics and predictive analytics algorithms to analyze vast amounts of supply chain data and identify patterns, trends, and insights.
- By creating digital replicas of physical assets, processes, and workflows, start-ups can identify potential bottlenecks, vulnerabilities, and opportunities for improvement, enabling proactive risk management and contingency planning.
- start-ups can build collaborative platforms and ecosystems that connect stakeholders across the supply chain, including suppliers, manufacturers, distributors, logistics providers, and customers.
- start-ups can have certain anomaly detection mechanisms in their solutions that hedge the possible risks of miscompliance.

In embracing a multitude of emerging technologies, start-ups in the logistics and supply chain management sectors are not only innovating and differentiating themselves but also driving substantial value for their customers.

By harnessing innovations such as autonomous vehicles, electric vehicles, drones, artificial intelligence, blockchain, IoT, augmented reality, 3D printing, edge computing, and more, these start-ups are poised to address evolving customer demands, enhance operational efficiency, and gain a competitive edge in a rapidly digitizing world.



In a Nutshell

To conclude, the age of technological innovation has ushered in a profound transformation across global operations, touching every known industry and driving rapid evolution.

The logistics sector, in particular, has, through the integration of cutting-edge technologies by new-age start-ups, experienced significant enhancements that have streamlined processes, optimized resource utilization, and enhanced overall efficiency, ultimately leading to improved customer experiences and cost savings.

However, the journey towards digitalization in legacy logistics and supply chain operations is not without its challenges, including resistance to technology adoption and concerns about data integrity.

Despite these hurdles, new-age tech-enabled start-ups are paving the way for a more sustainable and efficient future in logistics, leveraging emerging technologies to address evolving customer demands and gain a competitive edge in the global marketplace.

Looking ahead to the integration of innovative solutions such as autonomous vehicles, electric vehicles, drones, AI, blockchain, IoT, and more, there is immense promise for further revolutionizing the logistics industry and shaping the future of supply chain management. 