Supply Chain in India-
The Dawn of Industrial Revolution

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Abstract

The performance of logistics sector in the economic development of India has never been more compelling. A robust logistics sector can go a long way in boosting India's quest for being a manufacturing giant given that several initiatives like 'Make in India' have been launched by the government. Increasingly, companies across the globe are looking at the world as both a unified production base and a market that a competitive logistics sector can successfully tap into. The industry has seen rapid growth in the last few years due to increased planned outlay of the government, improved infrastructure facilities and greater access to global markets. However, our services have not adequately capitalized on the opportunity in the global market as multiple challenges continue to mire the sector.

The effort in the years ahead is to build a more robust logistics network in the country. With better infrastructure planning, increased coordination among stakeholders and improved operational efficiencies, India aims to unlock the potential of the sector needed to fuel economic growth.

Major Challenges Faced by Indian logistics sector

With globalization, logistics is expected to play an increasing role in driving the Indian economy. In 2016, India was ranked 35th in The World Bank LPI Index that ranks countries based on their logistics performance,moving up from 54th in 2014. While this is reflective of improvement in the sector, multiple challenges of infrastructural deficiency, lack of integration amongst stakeholders, lack of skilled manpower and slow adoption of technology continue to weigh it down.

Infrastructure

It is one of the hindrances that has confined growth of the logistics sector. It gets reflected in inadequate and low-quality modal and terminal transport infrastructure, suboptimal modal mix, inefficient and ill-designed storage facilities for cargo and containers and inefficient operational and maintenance protocols, and poor adoption/adaptation of technology. This leads to high and inconsistent cargo transit time, inefficient use of resources and poor fleet management. The selection of the mode of transport, or even storage and terminal handling protocols are rarely linked to cargo characteristics (distance of travel, parcel size, density, etc.). As a result, there is overuse of high-cost modes like road at the expense of cost-effective and sustainable modes like inland waterways and railways. The continuing and prolonged suboptimal system, which erroneously appears to be in equilibrium, needs to be changed. The way to strengthen the Indian logistics infrastructure is about deconstructing the old and building a new rational equilibrium.

Skill Development

India has a demographic advantage but the availability of appropriately skilled manpower remains a challenge. This is particularly so in the logistics sector as it is seen more as a support industry than a mainline one. Lack of skilled manpower is the result of inadequate training and proper leadership and support. The sector needs to specifically build a pool

of personnel comprising truck drivers, seafarers, warehousing managers, quality inspection supervisors, among others. There are limited institutes for soft skills, and operational and technical training. Also, due to the unorganized nature of the sector, which is characterized by poor working conditions and low pay scale, it is not a preferred choice among skilled personnel.

Information Technology

Slow adoption of new technologies has been another big constraint. Awareness about the economic benefits of using digital technology is low and collaboration among stakeholders far from satisfactory. As a result, the logistics ecosystem is fraught with operational inefficiencies and poor asset utilization. Lack of technology systems and insufficient technical knowledge add to the pain. Technological infrastructure has remained inadequate, marked by slow network speeds, subpar performance, and unreliable hardware and software, all leading to high costs and underperformance.

Regulatory Hindrances

The introduction of GST could change the contours of the logistics sector completely but such disruptive reform requires proper implementation. Multiple regulatory agencies, if not coordinated and brought under a single umbrella, could slow down the creation and operation of logistics infrastructure. Obstacles in land acquisition and consolidation, and change in land use still continue to be major impediments. Lack of transparency in compliances further adds to the woes of the sector.

Performance Standards

With a diverse customer base, consumer behaviours and expectations are also diverse. Both individual and corporate customers demand personalized services, flexibility and faster services. Due to these complexities and prevalence of fragmented suppliers, there is a need for integration of services in order to meet performance standards. There is a need for standardized services, transparency and compliance. Therefore, logistics service providers need to align their strategy with the business model and targeted customer segments. Additionally, initiatives such as real-time track-and-trace and other value-added services, will help service providers cut cost, raise productivity and optimize the supply chain. It is clear that the Indian logistics sector faces challenges and there is a lot to act upon. Use of innovative models, new technological systems, international best practices, research and adequate implementation approach can all help to improve the sector, which in turn can stimulate growth and employment in the country.

Integrated end-to-end logistics

A shipment is a set of horizontal flows which together constitute the chain interspersed with links, and which involves multiple stakeholders with varying business models and consequent expectations from the chain. Integrated logistics is the seamless flow of cargo across the value chain involving multiple stakeholders with varying business models. It helps to accomplish the task most efficiently, thereby reducing the cost and time of movement. Integrated Transport and Logistics Policy - A step in the right direction The Government of India is in the process of preparing an Integrated Transport and Logistics Policy that aims to transform India's logistics from a 'point-to-point' to a 'hub- and-spoke' model, thus evolving centralized strategic networks for shipment distribution rather than relying on direct route operations that may not be efficient. As part of this initiative, the government plans to set up 50 economic corridors, 35 multimodal logistics parks (MMLP) at 15 locations, ten intermodal stations, among other things. While a policy is already being considered for integrated logistics to be successfully implemented, several elements need to be integrated with the horizontal flow across the chain - services, infrastructure and information.

Integration of service providers and services

An end-to-end service provider is one who performs or consolidates, on one platform, a full range of logistics services - transportation, storage/ warehousing and other value-added services - required for the cargo to move seamlessly from the

origin to destination. The stakeholder groups involved in the flow of cargo on the other hand, are vertically integrated businesses targeted towards their own profit maximisation and/or other goals. Integration of service providers can be accomplished primarily through consolidation among existing stakeholders or the emergence of third party service providers. Therefore, a complementary set of service providers could get together for mutual benefit, or one large logistics player could bring others from across the value chain into its fold. Globally, the logistics market has undergone consolidation largely based on scale and operational efficiency. Partial service providers in the chain merge, acquire, and collaborate among themselves to provide comprehensive third-party logistics services at competitive pricing. In India too, service providers, who until recently were fragmented across domains, have begun to merge businesses. The objective of an integrated system is to better sync the vertical integration of individual businesses with the horizontal flow of the supply chain. Emergence of third-party logistics service providers is an evolutionary process and is linked with economic development of the country. Indian firms are looking at new logistics capabilities and more complex solutions from third-party logistics service partners. Another aspect of creation of end-to-end integration is the creation of performance standards for adherence that are achievable and acceptable to the diverse set of logistics service providers and other stakeholders.

Integration of Infrastructure (Multimodal transportation)

A prerequisite for service integration is the development of a robust multimodal infrastructure network that will enable the use of different modes of transportation to seamlessly transfer cargo. Such a transport network would ensure that freight is channelled through the most efficient mode for faster, safer, costeffective and pollution-free movement. This would be driven primarily through the development of multimodal logistics parks, streamlined economic corridor routes for efficient freight movement, and intermodal stations to connect various transportation modes.

Transport modes in India, typically operate as isolated entities, with a skewed modal mix that relies heavily (about 60%) on the already congested road transportation. The Indian coastline and river network has historically remained under-used, even though it is energy-efficient, eco-friendly and reduces logistics costs. Cost for coastal shipping is INR 0.15-0.2 per tonne km compared to INR 1.5 for railways and INR 2.5 for road. Addressing these anomalies alone provides a huge potential to lower logistics cost in the economy by INR 21,000-27,000 Cr by 2025. The Eastern Dedicated Rail Freight Corridor (1,856 km) and Western Corridor (1,504 km) projects are under implementation. Once operational, they will strengthen India's present rail infrastructure to carry freight many times over, possibly leading to a reduction in cost of transportation. The government has also announced the Sagarmala Program which focuses on development along four thematic areas - port modernization & new port development, port connectivity, port led industrialization and coastal community development.

Large lumpy investment in logistics infrastructure with high gestation periods - for instance in rail track, port sub-structure, among others - should remain a state responsibility given that the private sector has not shown any appetite for it. The baton should shift through the penumbral area between the public and the private towards greater private investment through a range of appropriately structured models including PPP. In fact more private sector participation will likely follow as the investment requirement increasingly shifts towards smaller and servicefocused infrastructure. The logistics industry in comparison has a modest financing need; it mainly requires working capital funding. Therefore, it can get by without any, or minimal, state support.

To ensure seamless flow across physical infrastructure, intermodal transfers should be efficient. Terminal infrastructure, comprising multimodal logistics parks (MMLPs), inland container depots (ICDs), container freight stations (CFSs)/ private freight terminals (PFTs), ports, and airports should be designed with

cargo specificity and operational requirements in mind. Such terminals lead to a break in the logistics chain and therefore impede the flow. Hence their presence in the chain is justified only when they either add value to the shipment or meet a regulatory requirement.

Multimodal infrastructure is often incorrectly assessed without considering the first and last mile. This can be the stumbling block in the end-to-end chain. Port and inland terminal/warehouse connectivity can be a part of the terminal plan, but the state needs to step in where land and other regulatory impediments arise. The location of terminals is its master key to success and its efficacy rests on good connectivity to the network.

Integrated Digital Platform

Another important aspect of integrated end-to-end logistics is digital integration. A single stakeholder visibility across the chain is generally limited to his own part, or sometimes to related domains too; but a complete end-to-end view is possible only through such a platform. For a stakeholder to become its inherent part, the benefits of such association must be clearly visible to him. The objective of a common digital platform is to enable seamless flow of information across various service providers and modes of transport. Such a platform should ideally be able to integrate all documentation related to the cargo flow, provide cargo visibility through track-and-trace, facilitate a seamless information flow and link the chain to invoice and payment points. The state has to play a role in this whole process. It cannot just be an enabler of digitalization across the board, but it can also address potential pain points for various stakeholders and even promote awareness among the stakeholders.

Industry 4.0 revolution - Adoption of digital technologies

In the current era of digital transformation, several technological disruptions have come together to create powerful tools that are reshaping industries across the globe. As various industries, such as retail with close links to logistics, are being redefined by digital technology, it is inevitable for such disruption to also revolutionize the logistics sector.

Digital transformation has the potential to have far-reaching payoffs for a leaner and smarter logistics by ensuring smoother interface among logistics stakeholders for seamless delivery. According to the World Economic Forum (2016), digital transformation of the logistics sector could translate into value of $1.5 trillion for players in the logistics sector and an additional $2.4 trillion worth of societal benefits by 2025.

Countries like Germany, Singapore, Hong Kong and USA, all of which possess more sophisticated logistics ecosystems have gone on to showcase how digital transformation has benefited their entire logistics value chain, including warehousing operations, freight transportation, and last-mile delivery. As a result, these countries have consistently ranked higher ranked than India in the World Bank's Logistics Performance Index. Multiple digital technologies can potentially impact different activities across the entire logistics value chain to bring in operational efficiencies, maintain cargo safety, enhance customer interface, revamp business models and bring about rationalization of logistics costs.As is being witnessed across the globe, applying these digital technologies to logistics operations in the Indian context may help improve the performance and efficiency of the sector in the following ways:

Internet of Things (IOT)

IOT is the networked connection of physical objects that can help capture information for generating new insights and adding value to business. It presents a unique technology transition and can enable the logistics ecosystem in India in the following ways:

Predictive diagnosis and monitoring performance

IOT may be used to monitor the status of assets in real time throughout the value chain. In several countries, advanced sensors are being used to monitor and detect risks pertaining to breakdowns, helping avoid process delays and fatal accidents. For instance, Union Pacific, the largest railroad in the United States operating around 8,500 locomotives that haul freight over 32,100 route miles of track in 23 states, uses

IOT to predict equipment and component failures. Acoustic and visual sensors are embedded in the tracks to monitor the condition of train wheels. This has reduced bearing-related derailments that can result in costly delays and up to $40 million in damages per incident for Union Pacific.

Providing visibility for in-transit carriers

Additionally, IOT, which includes Global Positioning System (GPS) and Radio-frequency Identification (RFID) systems, is being used to provide logistics carriers with real-time information on key location stats. This has helped make the logistics ecosystem more responsive. While on the one hand this provides greater Control to service providers to predict delivery times and improve asset utilization, it also enables customers to track and trace their consignment on a real-time basis.

Automation

Automation technology in the logistics sector allows the use of control systems for operating machinery, processes, vehicles, vessels, and aircraft through the use of artificial intelligence. From the use of robots to self-driven vehicle and drones, automation technology can be adopted in the logistics sector for:

Reducing manual intervention to bring down costs:

Artificial intelligence (AI) can help automate business processes to reduce/eliminate manual interventions for freight handling, to improve quality, speed up processes and subsequently bring down logistics costs. Almost two-thirds of the logistics costs are hidden, which is attributable to theft and pilferage of cargo, and holding of inventory. Therefore, automating processes may help in eliminating hidden costs, bringing down the overall high logistics cost in India. Additionally, reducing manual intervention may also help speed up inspection by regulatory agencies, ensuring minimum handling damage and reducing the inventory holding time.

Block chain Technology

It can be used to create common networks among entities unwilling to share information, without compromising on the integrity of the data. This technology becomes especially relevant in the Indian context, given the fragmented nature of the sector and lack of common platforms to exchange information. It may be used for:

- Synchronizing multi-party logistics value chain:

  Blockchain technology can be used to align processes seamlessly from one point of the logistics value chain to another by eliminating the need for duplicity of documentation processes. This, in turn, would also reduce the risk of errors creeping into the system due to manual data entry at several points across the value chain. It would also act as a catalyst for achieving an integrated end-to-end logistics system. For instance, Belgium's Port of Antwerp has initiated the process of using the block chain technology to streamline its terminal's container operations. The aim is to pace up interactions between port customers, including carriers, terminals, freight forwarders, hauliers, drivers, shippers, among others, by cutting down on multiple interactions between these parties and also preventing data manipulation.

Cloud Computing

Cloud technology refers to the universal, and convenient access to a shared pool of networks, storage, servers and applications that can be accessed through the web. This technology can help the Indian logistics sector by:

Optimizing asset utilization

As logistics in the country aims towards becoming leaner, optimizing asset utilization is important to enhance operational efficiency. The Indian road transportation sector remains highly fragmented and often the vehicle fleet either lies idle or returns empty after transporting the freight. Cloud computing can help service providers use assets more efficiently by collaborating with each other to share fleets and networks. Sharing information on cloud-based platforms in real time can help service providers coordinate and collaborate for the pickup and delivery of freight. This will not only reduce the idle time of their fleet but also make the delivery ecosystem more efficient.

Enabling storage and easy access of data

With cloud technology that enables the easy storage of vast amounts of data without the need for physical servers or hard drives, logistics service providers can easily access information from anywhere. This will give flexibility to service providers to exercise control over critical processes that require round-the-clock monitoring from anywhere.

Big Data Analytics

Big data analytics, another element of the digital revolution, enables number crunching and 'sense-making' of complex data sets that are captured through 'smart' devices and stored across servers and networks. It can be employed by various logistics players for:

Driving future strategy

Analytics can be applied to the entire logistics value chain to identify improvement opportunities and achieve operational efficiencies in the country's logistics framework. For instance, GE's analytics platform or Cisco's Unified Computing System (UCS) Integrated Infrastructure for Big Data9 can be used to manage and implement complex statistical analysis, data mining, and retrieval processes for big data that help identify key insights and trends. This analysis can then be used to develop algorithms and estimate the remaining useful life of assets, identify areas of operational inefficiencies, eliminate redundant costs and drive future strategy.

An expanding digital consumer base coupled with inadequate and ill-planned infrastructure facilities has left India trapped between growing demand for logistics services on the one end and a fragmented logistics services market on the other. Already some experiments are being made for adopting digital technologies in the country. But given the potential for significantly higher value to be created for the Indian economy, the sector cannot benefit much until a concentrated and collaborative effort is made by each stakeholder, including infrastructure providers, terminal operators, logistics service providers and technology companies.

Strategy to Implementation

In order to make the Indian logistics sector globally competitive an all-encompassing solution is needed instead of a piecemeal approach. To achieve this, the state can put in place a comprehensive national logistics policy for a larger and holistic improvement in the sector. An integrated logistics policy has recently been announced, with a focus mainly on development of integrated transport infrastructure. A national logistics policy must go well beyond. The national policy must incorporate key drivers for the sector namely integrated logistics, information technology, infrastructure, regulation, human resources and skill development and equally important the entire stakeholder community. The policy, among others things, should focus on:

a) Creating a vision for the logistics sector in the long term.
b) Formulating action steps for achieving this vision.
c) Creating a conducive environment for the growth of the logistics sector and should identify programs to address all aspects. A number of countries have developed similar blueprints and the policy makers can learn from the experiences of such countries.

Namaste DHL

As India is experiencing the rapid growth in the economy and is also 2nd most populous country in the world, expecting a growth rate of approx. 7.3% this year. **DHL Express** saw this economic growth and planning to introduce its Street Scooter concept along with that the launch of electric van which will be used for delivery of parcels and letters.

According to Ken Lee, CEO, Asia Pacific, DHL Express Asia, spoke to BusinessLine on the company's plans. He said, from the growth perspective, they see India as one of the countries with biggest growth areas. DHL is also having keen interest in pushing India towards Digitisation. The more-developed economies are more transparent, and are slightly more efficient. For developing economies like India, which are at the start of the digitisation phase, there will be a learning curve. But, eventually India will be playing like other

developed countries as well.DHL has also announced plans to start up operations in India and will work with BlueDart service in order to develop a direct presence in India.The logistics sector has lately seen a huge inflow of capital owing to the recent implementation of the Goods and Service Tax(GST), massive investment in the online retail industry and infrastructural development, all of which promise great growth potential.

DHL ecommerce has previously made many investments in the India through its BlueDart Express subsidiary and is now looking to expand its presence in the delivery based sector.DHL has committed to invest INR 1673 Cr over the next 3-4 years in order to expand their logistics business.

Conclusion

As we know that so many good things are happening in India in terms of development. We are 2nd most favourable outsourcing destination. According to the World Bank survey, who considered around 150 countries to measure Supply chain and Logistics performances, Ranked India 35th. By observing the results of the survey, it was found that India is spending its 13% of GDP in Logistics as global average is only 9-11%, which means we are spending 4% more comparatively, which is nothing but a **COST** needs to be avoided.

Supply chain and Logistics management are the areas in which logistics service providers (LSPs), by virtue of their expertise, are able to offer the most added value to transactions in the freight trade. Freight forwarders, as "logistics service providers," play an important role in supply chain management, as an increasing number of firms outsource their logistics function. These 3PL providers are now becoming more involved in the design, management, and control of firm's supply chains.

Logistics has played a crucial role in the growth of online retail in India. Not only has it allowed retailers to reach even the remotest corners, but has also given the ecommerce players the liberty to draw strategies like instant deliveries. Although leading players have now started with their in-house delivery services, a major chunk of online retailers are still dependent on logistic players like BlueDart, Delhivery, etc. to reach their customers. With a lot of initiatives and investments being taken to facilitate peer to peer delivery and services, the local logistics player will surely give company like DHL, a run for their money.

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