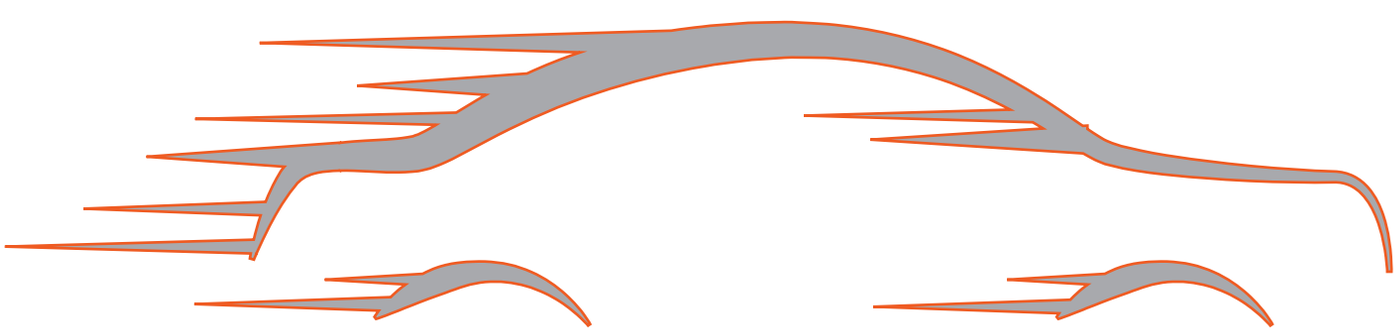
CII Institute of Logistics

Confederation of Indian Industry

Infrastructure partner:
INDOSPACE
INDUSTRIAL & LOGISTICS PARKS

Automotive supply chain 2018:

Tuning to new supply chain frequencies



Foreword

Indian Automotive Industry is at a very critical juncture today buoyed by enhanced global funding, players' competitiveness and a renewed thrust by the government on the Supply Chain to efficiently scale up the Automotive industry in India. Supported by enabling policies from the Centre and the Automotive Companies' hunger towards innovation, the Industry is set for a high growth trajectory.

This growth has to be aptly supported by the key lever of the value chain – logistics. It needs to be given its due attention, else it may affect the entire value chain adversely. Interestingly, the Third Party Logistics players have also come of age to cater to the burgeoning customer demands and are prepping up for the vibrant growth pastures. This report essentially offers you a fresh perspective into what's happening in the Automotive Supply Chain domain, companies' preparedness and strategies as well as latest trends that we will see in times to come.

This insightful report will act as the ready reckoner for the industry at large be it OEMs, Auto Component Manufacturers as well as LSPs who are on the look out for new ways to deal with challenges and bring forth newer dimensions into the already booming industry.

We hope you have a great read.

Mr R. Dinesh
Chairman - CII Institute of Logistics Advisory Council
Managing Director - TVS Logistics Services Ltd

Introduction

We are pleased to associate with the CII Institute of Logistics as the Infrastructure Partner for the Automotive Supply Chain 2018 Summit. This report is our endeavour to keep the industry updated with recent happenings in the world of automotive supply chain, provide it with best-in-class infrastructure strategies to pursue, as well as to highlight global trends that are set to transform the automotive logistics landscape.

Automotive supply chain has been catapulting the entire automotive landscape lately due to fast-paced infrastructure development, the growing organised nature of logistics and the granting of infrastructure status to the sector. Moreover, the introduction of GST has augured well for the industry, making business transparent and offering a level playing field to all. Today, it is all about your turnaround time, your speed to market and the infrastructure needed to support production, which leads to competitive advantage.

As the automotive industry reaches its next stage and global players explore newer avenues of growth in India, we are geared to serve them with large format, best-in-class industrial and logistics parks at strategic locations, aided by a complete ecosystem to ensure that the auto industry gets state-of-the-art infrastructure under one roof.

Rajesh Jaggi
Managing Partner-Real Estate
Everstone Group

Executive Summary

Two decades of robust growth have propelled India from being a net importer of automobiles to a leading manufacturer and exporter of vehicles and components. By volume, India is the 5th largest vehicle manufacturer in the world. It is the largest manufacturer of two-wheelers, three-wheelers and tractors, 4th largest in manufacture of light commercial vehicles and 5th largest in manufacture of heavy commercial vehicles. It is estimated that by 2020, the automobile industry in India will be the 3rd largest in the world after China and USA.

The automotive industry is a pillar of the economy and a key driver of macroeconomic growth and technological advancement. In India, the automotive industry contributes 7.1% to the total GDP and provides employment to about 32 million people, directly and indirectly. Furthermore, the sector attracted $16.5 billion in foreign direct investment between April 2000 and December 2016 and is slated to attract around $8-10 billion more in local and foreign investment by 2023.

Notably so, the entire value chain encompassing the automotive spectrum has a huge role to play in making this vision a reality. In line with this, the most crucial element of the value chain remains to be supply chain. According to industry experts, supply chain takes care of 65-70% of revenues. There are only two verticals that can make an organisation shake: supply chain & finance.

The automotive supply chain is complex and constantly moving as the global economy fluctuates. Companies within this vertical have to make sure their value chains are functioning properly, and that money is flowing in the right direction – just like any other industry. But, firms in this space have the added pressure of having to operate in the global marketplace while dealing with recalls and other important issues. Around 75% of automotive parts are not designed or built by car manufacturers themselves but by their suppliers, implying that car manufacturing is no longer a job of a single enterprise but of a complex ecosystem of supply chain partners.

In that regard, for companies in the automotive spare parts industry, growth depends on the success or failure of your supply chain management. In a global, volatile, and variant-rich industry, the ability to seamlessly move products from the production floor to your customers' door is top priority for supply chain planners and managers, and companies that achieve it, can leverage significant advantages over others.

Currently, India's logistics costs as a percentage of GDP are relatively high at around 14%. Recent reforms such as the Goods and Services Tax (GST), have already disrupted the supply chain in India towards higher operational efficiency, scale-driven warehousing, and use of more efficient sourcing models. With a view to drive operational efficiencies and faster time to market, customers are in the process of realigning their supply chain post GST. This paves way for a higher scope for 3PL and 4PL companies in the country to enhance their scope. There are a lot of opportunities that are opening up for them in terms of handling consolidated Vendor Managed Inventory (VMI) in warehouses close to their plants; and supplying it to their customers just in time.

But as always, the path to progress isn't easy as myriad challenges pose a greater threat to the entire supply chain. The foremost pain areas of the logistics industry in India are infrastructure challenges, unavailability of skilled talent pool; disparate processes /practices; and impact on environment. The government and industry are partnering at various levels to ensure better multi-modal, road, rail corridors, and warehousing infrastructure. Lack of industry standards and vast differences in even basics like size of pallets; and the size of trucks, the industry uses – has a large impact on supply chain efficiency and cost.

More than an efficient supply chain, the need of the hour is a smarter supply chain for automotive companies- one which will effectively help circumvent challenges. Such a supply chain has three key characteristics, as suggested by industry experts:

INSTRUMENTED – Using sensors and "smart" devices to gain greater visibility across the network, mitigate risk, reduce cost and manage rising complexity.

INTERCONNECTED – Integrating the entire supply chain – even the fragmented aftermarket – to share information, make decisions collaboratively and manage in real-time.

INTELLIGENT – Relying more on advanced analytics, simulation and modeling tools to evaluate increasingly complex and dynamic risks and constraints and act on better insight.

The new automotive supply chain consists of three key pillars; standardization, visibility and risk management. The industry must work to standardize the management of the physical and information supply chain. This will allow OEMs and their suppliers to streamline operations, thereby reducing overall costs. For many companies, this journey towards standardization lies at the core of their strategic plans to transform their global supply chain. The second pillar, visibility, is underpinned by the latest applications of information technology into supply chain operations. IT has the ability to inject visibility through analytics and tracking systems that record every transaction through the supply chain. This type of visibility allows companies to oversee exactly what's moving across their global network, at any one time. Visibility enables a more effective risk management strategy, the third pillar, by reducing uncertainty in the supply chain.

To increase the competitiveness of the domestic industry in comparison to global markets, the government needs to expedite the building of critical infrastructure that will reduce delays, costs and inefficiencies being faced in both inland and export trade. With ambitious targets for green mobility, and need for improvement in public transportation, the government needs to intensify efforts towards rapid development of an integrated and comprehensive infrastructure aligned with the evolution of the automotive industry.

In a nutshell, the ideal state of seamless information systems and hence real-time visibility is what all industry players are working towards. This leads to exciting opportunities of developing integrated and collaborative supply chains. This means looking at common information platforms with high capabilities of real time data capture and data processing to give a new meaning to 'agile supply chains'. A 'SMART'er supply chain is taking shape in the backdrop of connected data where all data streams are being captured and channelized into centralized systems, leading to smarter responses to and from customers, vendors, manufacturing points and sales networks.

FACTS

Automotive supply chains are among the most complex in the world, with each vehicle containing more than 20,000 parts originating from thousands of different suppliers.

India's auto industry has a potential to generate up to $300 billion in annual revenue by 2026, creating 65 million additional jobs and contributing over 12% to India's GDP.

The Power Performer

The core automotive industry (vehicle and component makers) is a key contributor to a wide range of industries in the economy. This results in a high multiplier effect for economic growth and development. Also, the scale, expertise, experience and innovation generated in the automotive industry can benefit adjacent industries such as aerospace, defense, construction and agriculture. Strong domestic demand coupled with supportive Government policies have led to the Indian automotive industry climbing up the ranks to be one of the global leaders. India is the largest manufacturer of two-wheelers, three-wheelers and tractors in the world, and the fifth largest vehicle manufacturer overall.

PRODUCTION IN UNITS

April 2017

25,330,967

April 2018

29,075,605

As per the data released in National Auto Policy Draft 2018, in the year 2016, 88.1 million cars and light commercial vehicles were sold worldwide. While production of these cars is confined to about thirty countries, majority of the cars sold worldwide are designed and developed in just five countries i.e., Japan, Germany, USA, South Korea and Italy. As per the information released by IBEF, the market size of the Indian auto component sector has risen by 11.5%, clocking $43.5 billion, with predictions of rising further in the coming financial year.

As per the information from the Society of Indian Automobile Manufacturers (SIAM), the automotive industry saw a growth of 14.78% from April 2017 to April 2018.

In April 2018, the overall automobile exports were boosted by an impressive 16.12%, while the exports of two and three wheelers were furthered by 20.29% and 40.13% respectively. However, passenger vehicles and commercial vehicles saw a decline in exports by (-)1.51% and (-)10.53% respectively. The big gainers of course were Maruti Suzuki, Hyundai, Toyota and even Tata Motors.

The largest carmaker is Maruti Suzuki India Limited (MSIL) with a market share close to 50% in the Indian market, followed by Hyundai Motor India Ltd. (HMIL), with a share of around 17%. Behind these are Mahindra & Mahindra Limited (M&M hereafter) (around 7%), Renault, and Toyota Kirloskar Motor Pvt. Ltd. (with approximately 5% share each). Leading Indian auto manufacturers are in the process of transforming from local players to global companies. India's domestic carmakers, viz. Tata Motors, M&M and Ashok Leyland, have developed manufacturing facilities, significant R&D, technology development and testing centres and have ventured abroad.

THE GROWING EXPANSE OF EVs

Companies have systematically invested in building new machinery to roll out product variants in keeping with the dynamic needs of consumers. With the plans of introducing electric vehicles, car manufacturers in India are gearing up to new production processes and machines. M&M is the only manufacturer of an electric car – the e20, a micro vehicle at present. Recently, the industry has been witnessing the emergence of original ideas, methods, and products in automotive technology. A leading automobile manufacturer has announced its EV 2.0 platform roadmap for electric vehicles. The key projects in this roadmap include a heavy, high-capacity Li-ion battery with a very high range of almost 400 kms, and new power trains that could achieve a top speed of 150-200 kms per hour. Maruti Suzuki Motors recently revealed plans to manufacture electric vehicles. Maruti plans to produce 35000 electric vehicles annually from 2020. Others like Volvo are also planning to expand its plug-in hybrid and electric vehicle portfolio in India.

LOGISTICAL LANDSCAPE

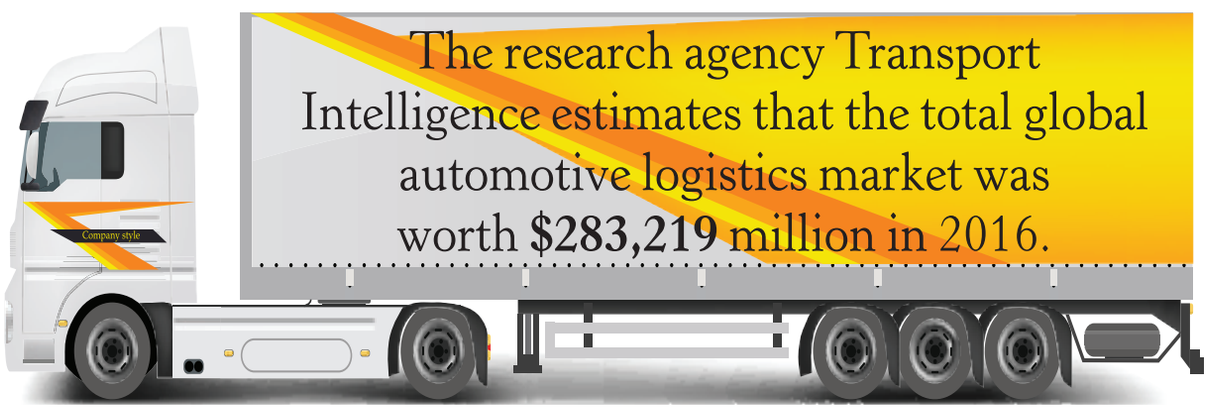
The automotive supply chain and logistics industry has undergone a period of significant change over the recent past and in the coming years may become unrecognizable, driven by trends often referred to as 'industry 4.0'. These trends include the likely widespread adoption of electric vehicles (EVs) with all the attendant disruption which this will have on engine production and spare parts logistics, to name just two key areas. In 5 to 10 years' time automotive supply chains are likely to look very difficult, although with the billions of dollars already invested in existing plants and production processes, change may be slower than many believe.

The research agency Transport Intelligence estimates that the total global automotive logistics market was worth $283,219 million in 2016. The global outsourced automotive logistics market grew by 4.5% in real terms in 2016 and was worth $84,511 million.

The global outsourced automotive logistics market is expected to grow at a CAGR of 2.7%. By 2020, this will mean the market is valued at over $93 billion. The fastest growing segment will be spare parts (CAGR of 3.1%), followed by finished vehicle logistics (2.9%) and inbound logistics (2.5%).

PREPPING UP FOR CHALLENGES

The automotive supply chain has many different aspects and is a very complex system. Companies who work within this industry have to be sure that their supply chain management system is functioning properly and that profits are growing as your customer base does. In reality, however, when the automotive industry continues to grow, challenges also continue to arise. Many of these challenges can be difficult and/or impossible to handle on your own if you are a small- to medium-size business. Strategic supply chain management must always be the top priority so that you don't fall behind when these challenges appear. To prepare for some possible challenges you may face, here are the top supply chain challenges that are impacting automotive companies, and how a third-party (3PL) logistics company can help you overcome these obstacles.



OVERSTOCKED INVENTORIES

Believe it or not, there is a sweet spot to inventory management. One must ensure that the inventories are well-stocked, but not overstocked. The automobile industry has been growing over the last few years, but that does not indicate a need to oversupply. Maintaining a healthy balance by working with a third-party logistics partners is sure to prove beneficial. Third-party logistics partners use software that tracks and measures inventory data, and this data helps companies make informed decisions about the items that are requested most. Once full visibility is at hand and items are well-stocked, more informed decisions can be made about the quantities of each item to have on hand every day.

SHEER AMOUNT OF RECALLS

Conducting a large amount of product recalls may prove highly expensive to the company. Failures in supply chain such as these could be long and complex issues and may tarnish the name of the manufacturer, disrupt the system and affect their reputation among the customers. The risk of negative consequences is higher if the company has a complex global chain. It may require considerable resources to trace and retrieve the affected products and deal with quality control. The safety and security of customers is always the number one priority in the automotive business. If a product encounters an event where airbag inflators turn out faulty, it may severely damage the company's reputation and the effects of such an event may be long-lasting.

CONTROL OVER SUPPLYCHAIN ON A GLOBAL SCALE

To optimize costs, automotive manufacturers, distributors, or suppliers must be able to move towards 'just-in-time' operations, especially if the product-range is wide and has an international reach. To achieve this goal, it is imperative to have full visibility of each element in the supply chain and have all the necessary data handy to create a plan for future growth. Third-party logistics companies provide software solutions that help companies automate their processes and have full visibility at every stage.

LOGISTICS CHAIN: FLEXIBLE AND RELIABLE

When adapting to changes in demand or responding to competitors, flexibility and reliability are a must. Be it high or low season, adjusting and management of each operational aspect becomes imperative to ensure profits and benefit from a good return on investment. Partnering with a third-party logistics company, which shares its levels of flexibility with the manufacturer, may prove to be fruitful, regardless of the conditions. Having a trustworthy and reliable partnership can guarantee a successful logistics chain.

The global outsourced automotive logistics market is expected to grow at a CAGR of 2.7%. By 2020, this will mean the market is valued at over $93 billion. The fastest growing segment will be spare parts (CAGR of 3.1%), followed by finished vehicle logistics (2.9%) and inbound logistics (2.5%).

COST AND LOCATION

As the intensity of manufacturing increases due to innovation, consumer demand, and technology, vehicle manufacturers will want to see their suppliers working locally. Automotive companies will want their suppliers to be available in every jurisdiction where they have a manufacturing president. Each business location must be evaluated by the following factors: financing, relocation or recruitment of the workforce, rules and regulations of a new jurisdiction, maintaining client production output quotas and quality, optimizing production lines during the transition, closing down one facility and setting up the other, etc., considering cost and location requires effective financial planning, otherwise companies can miss out on profits.

CAPACITY MANAGEMENT

Many OEMs lack an integrated, automated capability to calculate demand for parts based on forecasts or actual orders and the ability to compare it with supplier-installed capacity across the entire product life cycle. Identifying areas of risk and quantifying the effects of changes to forecast production demand also are limited, typically resulting in demand-supply mismatch, overused supplier capacity and compromised customer aspirations. On many occasions, this leads to line-run-without-component situations and, ultimately, failing to deliver vehicles on promised dates. This of course negatively affects the customer experience.

Other key challenges facing automotive OEMs today include the following:

Product complexity: The uniqueness of the automotive industry lies in its ability to offer millions of vehicle configurations to satisfy every customer segment. A feature is a unique product functionality that differentiates a vehicle. Each feature translates into demand for one or more unique parts, potentially creating high product complexities that pose challenges in parts procurement.

High demand variability: Given the deep focus on customer-centricity, OEMs often are forced to alter a completed order just a few days or weeks before delivery. This leads to high demand fluctuations and influences downstream activities, including supplier capacity.

Global expansion: This provides OEMs with opportunities to examine existing efficiencies that directly affect profitability. However, it also increases the challenges related to seamlessly integrating fluctuating demand with supplier capacity.

INFRASTRUCTURE: LEVELLING IT UP

Global economic condition is undergoing a tectonic shift and the role of infrastructure for both manufacturing and warehousing has been identified as the game changer for business to succeed. To stand out from the competition, identifying an appropriate manufacturing location with the optimised size requirements and investing in quality warehousing infrastructure has proven to be the right decision time and again. Be it material flow (both inbound and outbound), inventory optimization, cost management or speed of delivery, infrastructural development in warehouses is sure to help a company gain the slightest edge it needs to get the most value out of its supply chain.

Post the implementation of GST in 2017, warehouses are in the spotlight more than ever with the move toward consolidation resulting in increased complexity. With client centric approach; organisations are more focused on improving the aftermarkets supply chain distribution, smart warehousing and last mile deliveries. Storage of parts in an Aftermarket Distribution Centre runs in thousands and the SKUs are only growing since companies have to stock parts of vehicles which are 'out of production'. Given the complexity, companies are looking at better, more modern infrastructure to keep pace with storage and despatch requirements to fulfil customer expectations.

As the Indian economy grows, there are already signs of a surge in demand, and creating the necessary infrastructure at a faster pace is the need of the hour. The revolutionary construction technology of Pre-Engineered Buildings (PEB) has changed the face of warehouse construction for good. It employs fabrication in a controlled environment, prior to construction, so as to speed up the final construction by over 30% - 40%, making the new warehouse usable that much faster. Another key technology that boosts warehouse infrastructure is automation. The partnership between humans and machines has vividly changed

CONTROL OVER SUPPLY CHAIN ON A GLOBAL SCALE

the concept of traditional warehousing, ensuring rapid order fulfilment and accuracy. Even the smallest innovation in infrastructure like installing sweat-proof insulation or electronic dock-levellers are known to improve overall efficiency of the warehouse and the business as a whole.

GETTING BACK ON TRACK

Shining the headlights on these supply chain speed bumps is the first step to getting back on the road to success. But it will take more than just recognizing the challenges to actually overcome them. Improving the profitability and productivity of your supply chain demands innovative solutions to provide up-to-date data, connect regional and global processes and foster organization-wide collaboration. That's where concurrent planning fits in. For automotive supply chains, concurrent planning fuels:

ENHANCED DATA CONSOLIDATION

Vehicles are complex to manufacture thanks to a multitude of sub-assemblies, components and options packages. Avoid the constant scramble for information and answers when the unexpected happens. Ensuring all the required data is at hand and is up-to-date, by connecting all disparate data in a single system, is always a good idea.

IMPROVED END-TO-END VISIBILITY

It is important to stay on top of changing situations no matter where they occur throughout the network. Deep insights of the on-goings across the supply chain, no matter how far it extends, can be obtained by connecting suppliers, internal production facilities, distribution hubs and the dealer networks.

Auto Components: Nuts & Bolts

While they may seem to be mere components in a vehicle, they have the power to break or make the performance of the entire value chain. One component lost or damaged can jeopardize the entire vehicle manufacturing process and can even shackle the brand image if the after-sales service is not up to the mark. In view to this, utmost safety and precision is needed by components manufacturers to enhance turnaround time and reduce lead time while making sure that inbound & outbound journey is as foolproof as possible.

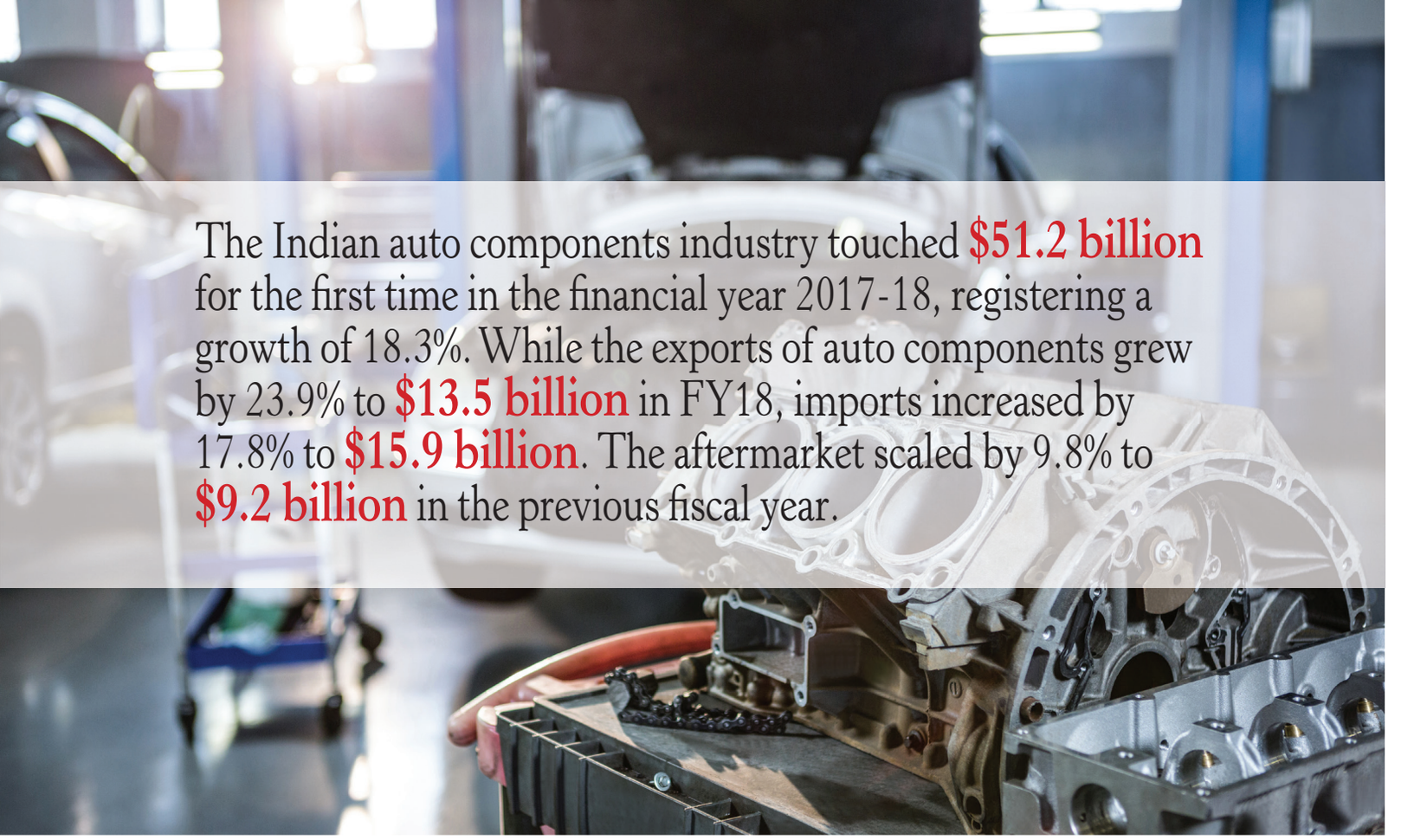
As per the data released by Automotive Component Manufacturers Association of India (ACMA), the Indian auto components industry touched $51.2 billion for the first time in the financial year 2017-18, registering a growth of 18.3%. While the exports of auto components grew by 23.9% to $13.5 billion in FY18, imports increased by 17.8% to $15.9 billion. The aftermarket scaled by 9.8% to $9.2 billion in the previous fiscal year.

A recent analysis by EEPC highlighted the US imported $290 million worth of auto components from India in April-June, a growth of 23.8% on yearly basis, to retain its position as the top buyer of Indian auto parts. Turkey was the second largest auto component importer from India with shipments of about $100 million in the first quarter of 2018-19, a year-on-year growth of 28.36%. Bangladesh, Brazil and Germany were the other major importers of Indian auto components with aggregate shipments of $80 million, $72 million and $61 million respectively for the period. Bangladesh showed the maximum growth of over 53% in auto parts imports during April-June. Though low in scale, Indian auto component makers have found expanding markets in Romania, Japan, Vietnam and Colombia.

The traditional distribution chain (top-down) involving component makers, wholesalers, workshops, and finally the end-users is no longer intact. With the advent of independent online sellers and increasing technical awareness among vehicle owners, the customer base is getting broader. Today, the automotive aftermarket is segmented on the basis of service channels of Do It Yourself (DIY), Do It For Me (DIFM), and Original Equipment (delegating to OEM's) segments. DIY customers have technical knowledge and interest to maintain, repair, and upgrade their cars on their own. DIFM customers buy parts online but get them installed in by professionals. The automotive aftermarket service channel comprises raw material suppliers, tier 1 distributors, automobile exhaust hubs/ manufacturing units, aftermarket units comprising jobbers, and repair shops, among others. Repair centers are the important stakeholders in the service channel. The industry is witnessing a trend of strategic alliances and collaborations between collision repair centers and leading auto insurance companies to gain a competitive edge and capture a significant share in the market.

AFTERMARKET SCM

Gone are the days of siloed industry operations where an OEM had a supplier base solely from within the automotive industry. Today's average midsize vehicle has approximately 40 to 50 microprocessor-driven systems, which require 20 million-plus lines of code. In contrast, a Boeing 787 has less than 15 million lines of code. This demonstrates how intricately linked and therefore dependent the two industries have become. Whilst consumers stand to benefit from increasingly intelligent and tech-savvy cars, manufacturers must face the challenge of greater risk and uncertainty



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entering their supply chains. Businesses must be proactive and work with suppliers to ensure supply chain practices are fit for a modern operation to avoid business interruption.

The spare parts market in India is largely sprinkled and fragmented, therefore finding genuine or high-quality aftermarket car parts remains to be a big problem for many customers, while at times people pay more money without the guarantee of quality and compatibility. As alternatives available in an offline market are few, digitally enabled automotive spare part sector could successfully resolve these problems, while offering more choices. Digitization will lead to transition of this large unorganized sector into an organized one, creating a win-win situation for both auto players as well end customers. In India, online sales, executed directly by original manufacturers of auto spare parts and a few online marketplaces, is still a niche area. However, to expand business and cater to the increasing demand of customers, the industry players need to embark on this journey. Shifting the market online will not just lead to increased margins from disintermediation, but also help build a closer relationship with customers, leading to better profitability and retention.

Changes in automotive technology will affect the component FIT (failure in time) rates and service requirements in the auto aftermarket in the years ahead. All of this challenge both OEM suppliers and auto aftermarket service providers to prepare now for the new service requirements to come. On the operational side, auto suppliers have implemented or plan to implement a range of technologies, including supply chain tracking and monitoring, enterprise resource planning and the internet of things technologies. Social and economic shifts are also set to reshape many aspects of the sales and distribution market, including an increase in shared mobility and mobility services and shopping offered through connected cars. Sensor-based parts and equipment will increase visibility and data; more advanced robotics, autonomous driving and machine learning will support new levels of automation and flexibility; predictive analytics could increase the accuracy of supply chain forecasting and planning.

With the automobile industry observing an increase in demand for hybrid/electric cars, it is slated to eventually limit demand for exhaust parts and specific tools. This growing preference for electric/hybrid cars can be attributed to increased prices of petrol and petrol engine-based automobiles. Rise in disposable proceeds of patrons in developing nations such as China and Brazil is expected to have a positive impact on the growth rate of the market.

Increasing demand for locomotives is projected to trigger demand for automobile component sales. Rigid regulatory standards pertaining to car safety are also anticipated to drive the market. New production technologies, such as 3D printing of automotive parts, is being extensively deployed by major players in the industry to optimize production costs. 3D printing enables efficient fabrication performance and reduction of emission toxicity.

FUTURE BECKONS...

The Indian auto components industry is expected to grow fivefold, touching a turnover of $180 to 200 billion in the next 10 years. The government is continuously focussing on enhancing the ease of doing business in India, GST being one of the biggest initiatives for the cause, which will help streamline the prevailing indirect tax structure in the country. It is crucial for the Indian automotive industry to synergize with the global supply chain and focus on R&D and innovation. The Indian auto components industry is going through a transformational period with the concept of mobility changing continuously. The business model of the industry is fast evolving and shifting from a manufacturing to a service-intensive industry. The shift requires the supply chain to change in order to build synergies with global value networks. The industry needs to contemplate about the contingencies of de-risking against natural calamities, which disrupts the supply chain and compliance with increasing tax structure.

Production capacity expansion outpacing domestic consumption will drive export-oriented growth in the coming years and will be one of the major factors that will have a positive impact on the growth of the automobile component market in the coming years. Cost-efficient operations and acceptable quality have increased export volumes for the auto components to global OEMs (original equipment manufacturer). Moreover, recent regulations that facilitate 100% FDI in the automobile industry will attract more joint ventures and wholly owned subsidiaries. This will augment export growth to OEMs in global markets.

Factors such as the rising vendor consolidation, faster replacement market growth, increasing localization, export-oriented growth, and growing electronic content per vehicle have induced the Indian auto component segment to continue to grow much faster than the OEM segment. This, in turn, will invite more exports to OEMs from auto component manufacturers. The OEM segment will dominate the auto component market in India throughout the forecast period and account for about 89% of the total market share by 2020. As a result of improvements in the perceived quality of Indian products, the industry has transitioned from supplying primarily to the aftermarkets to catering to OEMs across the globe. This shift toward OEMs will continue to fuel the growth of the automobile component market in the coming years as well.

FACTS

The auto component industry is looking at more than doubling its investments in the next 9 years to clock a targeted turnover of $200 billion by 2026. Exports are expected to grow from $11 billion now to $70-80 billion while aftermarket will grow from $8.5 billion to $32 billion.

With the connected supply chain, a top volume vehicle manufacturer can save up to $1 billion in annual costs. In a future connected supply chain, manufacturers will have a common platform to operate with real-time visibility through the combination of IoT data with analytics, thereby promoting greater interdependency, collaboration, dynamic responsiveness and the flexibility to integrate disruptive innovations.

Tech at the Core

The automotive industry is undergoing the most significant change since Henry Ford industrialized automotive manufacturing in 1908. Digital is driving the revolution. While the past 100 years were largely focused on incrementally enhancing manufacturing to become more efficient for mass scale, the future is about redefining the role of the vehicle for passengers. In the technology world, the latest advancement is only as good as the next thing coming down the line and the automobile industry, which thrives on technology, is no exception to this rule. As per a report by McKinsey, a few trends will shape the industry for the future; diverse mobility, autonomous driving, electrification, and connectivity.

Though there is a great deal of speculation as to how these technologies will finally shape up the industry, disruption through technology is indeed knocking on the auto industry's doors.

FACTORS DRIVING TECHNOLOGY

Powertrains are evolving rapidly. For the first time in a century, there are serious alternatives to the internal combustion engine.

Guidance is becoming automated, with active cruise control and collision avoidance systems being used as the basis for wider capabilities in semi-autonomous vehicles.

There is continued rapid expansion in emerging markets. If measured by numbers of cars sold, China is now the largest market.

The aftermarket appears to be maturing structurally in developed economies, whilst growth is explosive in emerging markets.

Automation is increasingly used at assembly plants, changing the design of line feed and consolidation operations.

The nature of assembly and production is being transformed by the demands of new technology. Automotive supply chains will come to more closely resemble those of the high-tech sector, not least through globalized networks of supply.

Brexit and the renegotiation of NAFTA will provide additional challenges to the movement of automotive components in Europe and North America.

SLATED IMPACT

Supply chain geography is changing. Vehicle manufacturers now have a large proportion of their production capacity located in China, with other emerging markets (such as India) growing in importance.

The nature of product in the supply chain will change, as new types of engineering transform the economics of the sector. Supply chains will become more globalized for some components such as electronics, increasing pressure on air and sea freight operations and performance.

Challenges in distributing products to emerging markets will also place additional pressure on logistics providers.

Collision avoidance systems will ultimately reduce the amount of crash' spare parts needed, and electric vehicles will have a fraction of the parts of a traditional engine impacting significantly on the aftermarket.

There are numerous concrete examples of how supply chains will be forced to adjust. For example,

all-electric propulsion will see the requirement for an engine plant disappear, with logistics focus shifting to the management of battery production and the movement of batteries to assembly plants. Changing materials use will change the nature of the 'frame shop', the feeding of steel coil will reduce or disappear and carbon fiber fabrication facilities will be created feeding assemblies into the primary plant. New digital guidance technology could see a significant part of assembly operations become like that of IT hardware such as PCs or mobile phones. Overall, there will be a dramatic fall in the level of assembly activity needed inside vehicle manufacturing plants, and this will have an enormous impact on logistics and supply chain management.

TOWARDS THE NEXT WAVE OF DIGITALIZATION

Technology in supply chain is truly revolutionizing. The changes are faster and versatile. It has greatly eased the movement of goods in terms of tracking, monitoring and reverse logistics. It gives companies leverage to redesign product, redesign packages as well as logistical requirements. Internet of Things has helped companies in a much bigger way. Earlier we couldn't track the exact date of delivery, so dealers or suppliers used to take the advantages of the situations to increase their credit availability, but due to technology intervention, it's completely visible. Significant investments in technology has resulted in visibility and transparency, awarding the companies the ability to track components and automobiles as they pass through various supply chain touch points, dealer outlets and service points. This also resulted in improved collaboration, enablement of shared warehousing and enhanced transportation strategies.

Automation has made loading-unloading possible in the shortest and safest means possible. Barcoding and scanning systems have revolutionized the inventory management. Smartphones have also augmented this growth bandwagon with data available at your fingertips.

Amidst all these, supply chain executives need to ensure the accuracy of data so that there is lesser dependency on manpower. One needs to think of long-term perspective than the present scenario. Lot of digitisation is happening in terms of GPS and barcoding. Technology plays a major role in integrating processes, systems and taking a holistic industry wide approach. It also brings integration in the supply chain gamut between the service provider till the customer.

TRENDS TO WATCH OUT FOR...

BIG DATA: Automotive big data is a somewhat novel market for the automotive industry. Many factors can influence the growth dynamics, however despite any concerns, the market will experience immense growth. The global market for automotive big data is estimated to exceed $4.7 billion and will continue expanding with double digit growth. Connected cars made driving more safe & secure and enjoyable. It became available by big data generation and analysis of it. Automotive big data is a cornerstone for introducing autonomous vehicles and developing smart cities.

IN-CAR CONNECTIVITY: The idea of smart devices like smartphones getting connected to the in-car infotainment system is now common, and is being integrated into numerous categories of vehicles, including lower cost city hatchbacks. Google has created the Android Auto and Apple has created CarPlay, both of which are platforms for connecting smart devices with the car, and make the device the central point for information, entertainment and utility. AR (Augmented Reality) based systems will have a crucial role to play, as it will be combining AR with existing technology to smoothen customer experience and could eventually solve problems for vehicle makers as well; mechanics would be able to gauge what is wrong before touching any equipment whatsoever.

A breakthrough of "in-vehicle" AI and algorithm solutions will be the most important next step in auto technology in the coming twelve months. Amazon's Alexa and Google's Home are already being brought into some models. This means that these cars will become 'third places', closely integrated with drivers' offices and homes. For smart manufacturers, the use of IoT (Internet of Things) devices improves the efficiency and productivity of manufacturing operations, helping to minimise new vehicle delivery times. By connecting their lift trucks businesses can keep their fingers on the pulse of the entire fleet in real time and ensure everything moves smoothly.

SHARED TRANSPORTATION SERVICES: From e-hailing and networking for car pools, the mode of transport will be visibly different in many cities across the world, especially where vehicular traffic and pollution are burning issues. Car sales will indeed grow by volume, but in terms of growth rate, it is expected to come down from 3.6% in the last 5 years, to around 2%, but by the time 2030 arrives. Eventually a part of the private vehicle sales would decline, and the case for shared vehicles would go up, which would eventually offset any short-term losses to the industry. Overall, with the global working class rising in numbers, there will be a more buying power within reach for a larger number of people, but the effect on the growth of the automobile industry may not be direct.

OPEN SOURCE 3D PRINTING FOR BETTER COSTS: 3D printing on an industrial scale is indeed catching up, and the automobile industry is one such industry which will utilize the benefits. Spare parts and car makers themselves could find value for money in outsourcing manufacturing responsibilities in part to those who can provide components through the 3-D printing process. It would also allow a single component manufacturer or 3-D printing services provider, to produce for numerous companies, which would open up new opportunities.

DRIVERLESS VEHICLES TO GET A STRONGER PUSH: The concept of driverless or autonomous vehicles has been tested in numerous capacities, and even proven successful, like in the US, though there have been instances like Tesla's case, which did not prove successful. However, companies won't halt the efforts towards autonomous vehicles, when technologies like self-parking and adaptive cruise are being tested and could start becoming a standard feature in a whole plethora of cars. There may be high-profile trials of technologies like platooning, where autonomous vehicles will be made to work in tandem, to ensure that there is less congestion on traffic heavy roads.

Globally driverless transport systems have until now primarily been used for highly repetitive tasks, such as transportation of small parts. It is anticipated that narrow aisle trucks (VNA), reach trucks and low level order pickers (LLOPs) will increasingly be used in automated transport and in the putting away and extraction of palletized goods. This may involve full, or partial, automation of the truck using induction loops, camera systems, lasers, GPS or a combination of several systems.

BLOCKCHAIN: Blockchain, the encryption solution using public "ledgers" to secure digital payments, might very soon be used to authenticate drivers, cars and car parts, data transmissions, and other parts of the digital puzzle that is the "digitized" auto industry. There's a plethora of use cases, from supply chain management to car sharing interactions to preventing odometer fraud and both OEMs and suppliers are already embracing most of them. This market will generate revenues of $88.1 million in 2018.

Blockchain supply chain technologies within the automotive market are about to enter a period of phenomenal growth and innovation. The next ten years will see the large-scale commercial deployment of blockchain technologies, a boom in the emerging market, but also a range of R&D projects and innovations of other technologies which could become game-changers subject to successful commercialization. While Retails Sales, Service and Finance Management segments will continue their dominance when it comes to installed capacity, its share in many developing countries is expected to grow due to growing fake part shipping cases which are demanding provenance for car parts. Changing economy prospects in developed regions are also expected to drive the adoption of blockchain technologies in the automotive industry.

MOBI-LISTICS: If it's from A to B, it's mobility – if it's from B to A, it's logistics! In the future, we will no longer differentiate between the business models for transporting humans and goods. Autonomy, sharing and platform-based delivery services will revolutionize mobility patterns and lead to "mobi-listics", the merging of mobility and logistics. In 10 years', time, traditional public transport solutions could be replaced by on-demand autonomous capsules.

Policy Imperatives

Looking at the stupendous growth the automotive industry is making, Central Government has also been supportive enough to drive the momentum. The biggest reform of all times, we got to witness the GST implementation last year. The introduction of a GST Network and E-Way bills has solidified the country's supply chain and put in place a structure that facilitates transparency. Now a dealer can track their shipments whether it is intrastate or interstate.

The new unified tax regime is having a far-reaching effect on different industries, more so on the roads logistics sector. GST has resulted in the abolition of state-level VAT check-posts which in turn has reduced truck turnaround time (TAT). Earlier trucks used to get stuck for days together at the check posts, but now it is not the case. Another benefit that was expected from the implementation of GST on the sector due to increased compliance was a gradual shift towards organized players from small and fragmented transporters. There was also a likelihood of companies consolidating their warehousing network, thereby bringing in efficiencies in overall supply chain management. As per ICRA estimates, there has been about 18-20% improvement in trucks TAT because of GST.

The removal of inter-state check-posts has led to significant reduction in waiting/idle time for trucks, thereby improving their TAT and efficiencies. The TAT reduction is more noticeable in states previously having a bad reputation of high waiting time spent at their inter-state borders such as Kerala, West Bengal, Maharashtra, Madhya Pradesh and Bihar.

Similarly, since the GST came into force, companies are evaluating revamping their supply-chain networks and consolidating their warehousing network. GST was expected to spur consolidation of warehouses as need for tax-based warehouses got eliminated. However, consolidation has been restricted and has varied from sector to sector and; company to company.

Consolidation of warehouses has mandated use of bigger trucks to move larger consignments to the bigger warehouse. However, the impact is yet to be seen so far, the demand for big trucks has been driven primarily by stricter implementation of overloading restrictions in the last one year. Nevertheless, many companies have reported increased demand for big trucks because of the need to expand operations due to increased demand for GST-compliant transporters.

Currently logistics costs average 13-14% of GDP and bringing the same down is one of Government's key focus area. The implementation of GST and the full benefits of the same are bound to reduce long term costs due to reduced transportation costs, savings on warehousing costs and the associated efficiencies. Higher compliance costs related to GST due to technological upgradation, upskilling of workers, penalty charges etc., have added to the cost-burden of transporters, which coupled with the increasing diesel prices, have taken a toll on their profitability. These are short-term pains as reduction in truck TAT and setup of efficient warehousing networks would improve the overall efficiency in the system and bring about a reduction in logistics costs, over a longer period.

E-WAY BILL

The implementation of the E-way bill from April 2018 is also favorable for the longer-term. For a lot of transport companies, operations have become more systematic, and there is considerable time savings and paperwork reduction due to the

digitization of processes. Although few companies faced difficulties due to teething problems like technical glitches, limited awareness, etc., the overall response to E-way bill has been positive.

RECENT AMENDMENTS

The government recently announced two amendments in the new axle load norms, giving relief to industry players as they will not have to re-engineer the existing models. As per the notification issued by the Road Transport and Highways Ministry, the maximum safe axle weight in the vehicle of single axle with two tyres has been changed from 7.5 tonnes to 7 tonnes. Besides, the notification clarified that vehicles which got Automotive Research Association of India (ARAI) approval before July 16 will not need any new changes and they can move to the new Gross Vehicle Weight (GVW).

The government increased the official maximum load carrying capacity of heavy vehicles, including trucks, by 20-25% besides scrapping the mandatory annual renewal of fitness certificates for freight carriers. The gross vehicle weight of a two-axle truck (two wheels in the front axle and four wheels in the rear) has been increased to 18.5 tonne from the existing 16.2 tonne, increasing the load carrying capacity by just over 20%. Similarly, the gross vehicle weight for a three-axle truck has been increased to 28.5 tonne from 25 tonne: For a five-axle truck, the vehicle weight has been increased from 37 tonne to 43.5 tonne, increasing the load carrying capacity by more than 25%. The load carrying capacity for other categories of multi-axle trucks has also been increased. For tractor trailers, the limit has been raised 36%.

With the new norms in place, the commercial vehicles sector is expected to see a sharp deceleration in growth as new axle norms will create additional load capacity and hit demand. It also appears to militate against moves to strictly enforce limits to combat dangerous overloading that's rampant in the transport business. A senior government official stated that now, we are on a par with the international freight carrying norms for transport vehicles. It will also bring down overloading. The new norms will be applicable to the vehicles that would be manufactured after the statutory order comes into effect. Heavy vehicle manufacturers will be given time to meet the standards of the new norms.

This will have a visible impact in interstate movement, which accounts for the bulk of primary freight and where overloading is limited. A 20-25% increase in freight carrying capacity would be equivalent to three years of incremental freight demand. The other impact would be Spot freight rates would soften. Large fleet operators, carrying dense bulk commodities, would be able to carry more freight, improving their margins. Contractual freight rates would remain resilient until the contracts are renegotiated the logistics costs of most companies will come off. This would be positive for infrastructure projects as moving construction material to project sites would turn cheaper.

ELECTROMOBILITY

There are three major government initiatives regarding electric vehicles and mobility. The National Electric Mobility Mission Plan 2020 (NEMMP) aims to encourage indigenous hybrid and electric vehicles production through government-industry collaboration. The aim is to put 6 million electric and hybrid vehicles per year on the road by 2020. It is estimated that a cumulative outlay of $2.15 billion is required for this initiative. The Faster Adoption and Manufacturing of

FACTS

The Draft National Automotive Policy 2018, formulated by the Department of Heavy Industries, envisages increasing exports to 35-40% of the overall output and to make India one of the major automotive export hubs in the world. It also envisages long-term roadmap for emission standards beyond Bharat Stage VI and harmonization with the global standards by 2028.

(Hybrid &) Electric Vehicles in India aims at incentivizing the use of e-vehicles across all vehicle segments ranging from two wheelers to light commercial vehicles and buses. The four focus areas of this scheme are technology development, demand development, pilot projects and charging infrastructure. Following this, Energy Efficiency Services Ltd. (EESL) has invited global bids for 10,000 electric sedans as a part of its phase one of the scheme. It has also floated tenders for 3000 alternating current (AC) charging points and 1000 direct current (DC) ones.

The objective of the New Green Urban Transport Scheme (GUTS), 2017 is to promote low carbon sustainable public transport system in urban areas. The scheme will be executed with the help of private sector including assistance from the central and state governments under a seven-year mission with a total cost of $10.76 billion. For first phase, 103 cities have been identified. These cities are either capital cities or have a population of five lakh and above. The scheme will push for promotion of Non-Motorized Transport (NMT), public bike sharing, Bus Rapid Transit (BRT) systems, Intelligent Transport Systems (ITS), urban freight management etc.

The Union cabinet is also soon expected to take a call on the 8,730-crore second phase of Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles in India (Fame India) scheme that proposes fiscal and non-fiscal incentives to electric vehicle firms for five years. The power ministry is close to finalizing a policy for electric vehicles charging infrastructure that proposes granting subsidies to PSUs for setting up a basic charging station network in big cities and highways for gaining momentum in electric vehicle sales.

FACTS

Automotive Mission Plan (AMP 2026) aims to propel the Indian automotive industry to be the engine of the 'Make in India' programme as it is amongst the foremost drivers of manufacturing sector. Other the next decade, the sector is likely to contribute in excess of 12% of the country's GDP and comprise more than 40% of its manufacturing sector. Around 13% of the excise duty collection of the government can be attributed to the Indian automotive industry.

"The government is taking legislative as well as administrative measures for an integrated strategy to reduce logistics related hurdles for boosting domestic and global trade. High cost of logistics impacts competitiveness and movement of goods. The Indian logistics industry is estimated at around $215 billion, which is growing at over 10% annually. We have to increase our share in global trade and logistics plays a very important role in that. The ministry is developing a national logistics portal as a single window market place to link all stakeholders and preparing an integrated strategy to reduce cost of exports, imports and domestic trade," says **Suresh Prabhu, Commerce Minister, Government of India.**

Collaborate To Succeed

Visibility, trust and collaboration in the entire ecosystem will be game changers and enablers of an efficiently streamlined and adaptive value chain. Agile and scalable solutions, which are co-created by relevant stakeholders, can help manage volatility and mitigate risks both upstream and downstream in the value chain.

There has been a shift in how companies view supply chain as an important vehicle of profitability and competitive advantage – it's getting due attention at the board level; and is increasingly becoming a part of the strategic planning process in matured organizations, from an enhanced predictive analytics and data science perspective. For all the strategies to come to fruition, all the stakeholders should work together to formulate policies that support indigenous development of technology over import dependence. The need of the hour is sustainability over speed.

Advanced supply chain models based on multi-tier, multi-supplier collaboration can lead the way where visibility and analytics are the key decision-making tools; and offer collective benefits. The partnerships in the supply chain are configured as business relationships. They are based on trust, shared risk and shared rewards that yield a competitive advantage, resulting in business performance greater than what would be achieved individually by firms. With companies operating in different parts of the globe, there is an increased pressure to build relationships with different kinds of firms for manufacturing.

Advancing your supply chain to improve performance and working capital requires collaboration. But true supply chain collaboration is much more fundamental than information technologies committing to new platforms. Lean material flow requires each function and firm to first recognize that they are part of a system of interconnected functions. Recognition of the supply chain system is the first step in total cost decision making.

The industry needs to look at a higher degree of collaboration at the back end. The whole concept of individual supply chains needs to merge at some point to pave the way for an integrated supply chain that leads to cost optimization by unlocking the synergies of capacity utilization. Worldwide the trend is to use bigger 3PLs to handle transportation and warehousing across auto companies in the same geography. Once the industry is able to collaborate on this front, we will see the costs of supply chain getting optimized.

DRIVERS OF COLLABORATION

Exponential complexity growth is arguably the greatest current challenge facing the supply chain. The surge in complexity has been fueled by challenges such as supply chain globalization, acquisition pace, new retail channels (i.e. omni-channel), regulations, and a rapid increase in the pace and complexity of new product introductions.

Cost savings fatigue—another major challenge—is the result of supply chain managers spending decades in the relentless pursuit of cost savings.

FACTS

Achieving supply chain collaboration requires cultural and process commitment. It is a key differentiator for best in class organizations. The good news is that it does not require investment in any kind. Just a different way of thinking.

At this point, the opportunities to improve appear to be dwindling. Common business strategies to deliver profit goals by offsetting inflation or driving a competitive cost advantage by being the low-cost provider have been increasingly difficult to support.

While collaboration has been on the agenda of major automotive companies, here's what global trend calls for:

EMERGENCE OF TIER 0.5 SUPPLIERS

Supplier partnering changes the transactional nature of their relationship and blurs the lines between an OEM and its Tier 1 supplier. With confidence that their customers are engaged with them, suppliers become innovation partners, not just fillers of purchase orders. This opens the pipeline for a "Tier 0.5" supplier. Tier 0.5 suppliers work long-term with their customers, often jointly setting cost targets and sharing product developments.

Despite the increase in collaboration, relations between suppliers and OEMs haven't improved significantly over the past decade. The Automotive OEM-Supplier Working Relations Index from Planning Perspectives (PPI) reveals Toyota and Honda are rated as having some of the best supplier relations among OEMs — however their ranking still falls into the 'adequate' category. This relationship should be a focus of improvement for OEMs. Their supplier relations rating is highly correlated to the benefits the OEM receives from its suppliers — including new technology, lower pricing and best supplier support — all of which contribute to the OEM's operating profit and competitive strength. The Tier 0.5 model can work in the favor of both partners — suppliers build a close relationship with the OEM and secure a strong strategic partnership; OEMs get the benefit of keeping a close eye on their supplier and learning from the vendor.

Two areas in particular with a steep, ever-changing learning curve are electric cars and autonomous vehicles (AVs). All companies have now announced the next generation of electric cars, and with that it will also fundamentally change the entire supply chain as well as procurement in a very substantial way. As production of electric vehicles expands, OEMs will buy more electric powertrains and batteries, and fewer combustion engines that run on fuel. In fact, Volvo has pledged to create only hybrid or electric vehicles beginning in 2019. To make this transition, OEM purchasing managers face a few options: continue to work with the same suppliers in hopes the vendors will innovate and deliver, or find new suppliers specialized in manufacturing electric parts — or a combination of the two.

With OEM sourcing managers armed with the knowledge of evolving technologies, the challenge remains in how to stay ahead of the curve. Emerging technologies can change so quickly that it's difficult to keep up. By the time an OEM learns a new technology and how to implement it into its supply chain, the technology is already 'old' by innovation standards.

END-TO-END VISIBILITY

For most of the automotive companies, unreliable suppliers in terms of delivery time and inaccurate forecasting systems and the unexpected standstill of the production line due to insufficient or missing components are some of the major issues facing manufacturing processes. Similarly, parts arriving too early for production face the burden of being stored and maintained at large cost due to the inefficiency of the supply chain. At a time of cost pressures, over-capacities and increasingly demanding customers, automotive companies have

started to invest in new ways of maintaining and improving their supply chain performance and access to real-time data becomes a major success factor towards this goal.

The value of end-to-end visibility in today's automotive supply chain is increasing in importance as the industry relies more heavily on global interconnections. Automotive manufacturers expect accuracy and speed across the supply chain and lack of integrated IT capabilities allowing for tracking and planning changes in supply chain management is slowing down industry suppliers in managing disruptions and improving sourcing and transport decisions.

Giving access to real time data such as location and security of shipments suppliers gain a high-level view of all supply chain movements allowing for route optimization and closer collaboration with people on the receiving end of the production. Receiving data in real time also allows for alterations in the production process to be implemented based on the current status of expected in-bound parts. The technology offers a seamless data-rich experience to improve product visibility across the entire supply chain and minimizing supply chain disruptions, thereby resulting in more efficient logistics processes, significant time savings, improvements in stock control and in the overall performance in terms of cost and delivery on time.

CLOUD IS THE KEY

The key opportunity that exists and the direction in which the industry is headed is the use of cloud data to link the supply chain, so the entire supply chain becomes a single, integrated global manufacturing operation, rather than discrete operations joined by logistics, enabling a lot more to happen in real-time. The emergence of 'Smart Factories' is dependent on the implementation of 'Smart Logistics', which provides real-time analysis of supply routes such as potential bottlenecks and the ability to react immediately to changes in demand, inventories and manufacturing and logistics capacity. Such trends point to the need for more premium freight, more expertise, more flexibility, more responsiveness, more contingency planning and more strategic use of built-in emergency logistics as a proactive safeguard of highly responsive, high-risk supply-chain operations. Fundamentally, the supply chain always will rely on components leaving one location and arriving at another, we just have to ensure this process is as swift and foolproof as possible. As they say… sustainable collaboration isn't an overnight accomplishment and it's not a one-and-done project. It's an ongoing commitment to working together toward supply chain excellence. We just to do our part right and the rest will follow!

Conclusion

To conclude, following are some critical supply chain capabilities and practices which automotive manufacturers and suppliers should have to create a well-oiled supply chain:

- Lean manufacturing and logistics practices
- Replenishment processes, procedures, and policies that ensure high-quality, low-cost, on-time deliveries throughout the extended supply chain
- Electronic communication between suppliers and customers (zero latency preferred)
- Real time collaborative communication throughout the supply chain to address potential issues in meeting demand requirements
- Ability to react to weekly schedule variation, comparing demand to capacity
- Ship according to a latest set of transportation routing instructions
- Real-time response to alerts, issues, and exceptions
- Repeatable processes that minimize human intervention including continuous process measurement and reporting
- Weekly or monthly identification and measurement of key trending metrics, with corrective action planning to address metrics that don't meet goals.

ABOUT CII INSTITUTE OF LOGISTICS

Logistics sector in India is poised for accelerated growth led by GDP revival, increased need in transport infrastructure, e-commerce penetration, impending GST implementation and other government initiatives as "Make in India". Estimated to have grown at 15% in last five years, logistics boosts growth at its wide array of services like transportation, storage, distribution and integrated/ allied services.

To address the growing need of sharpening India Inc's competitive edge through better Logistics and Supply Chain practices, CII Institute of Logistics (CIL) was established in 2004 by the Confederation of Indian Industry as a Center of Excellence in Logistics and Supply Chain.

At CII Institute of Logistics, we create a platform for the Industry to gain more insights into the emerging trends, industry specific problems of national importance and global best practices in logistics & supply chain management. We enable the industry to cut down the transaction cost, increase efficiency, and enhance profitability and enable to sensitize and bring solutions to macro level issues.

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CII Institute of Logistics to be a platform to create and share intellectual capital for reducing transaction cost and improving competitiveness, in the process nurture the skills of Logisticians and ensure adoption of Best Practices in Logistics and SCM through online and offline activities.

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