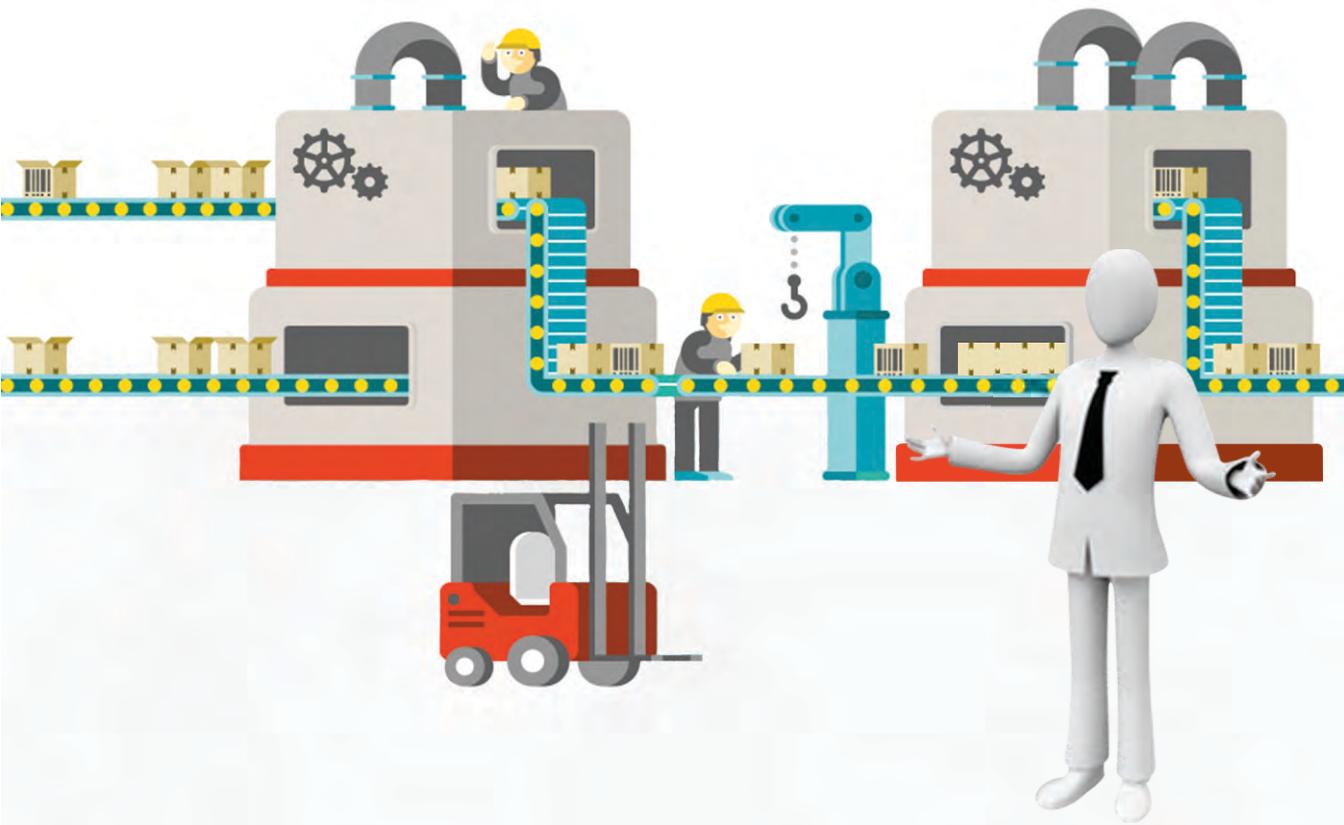


Logistics Focus

In-house Publication of Transport Corporation of India Ltd.

September 2013

PRODUCTION LOGISTICS



ON TIME DELIVERY. THE BACKBONE OF SMART PRODUCTION LOGISTICS.

Single window for all Logistics Solutions



1000+ fully computerized offices • 5000+ strong and dedicated workforce • Over 7000 trucks in operation • Fleet of 4 cargo ships • 9.75 million sq. ft. of warehousing space • Moving 2.5% of India's GDP by value of cargo • Own Offices in 4 countries • IATA and ISO Certified



Transport Corporation of India Limited

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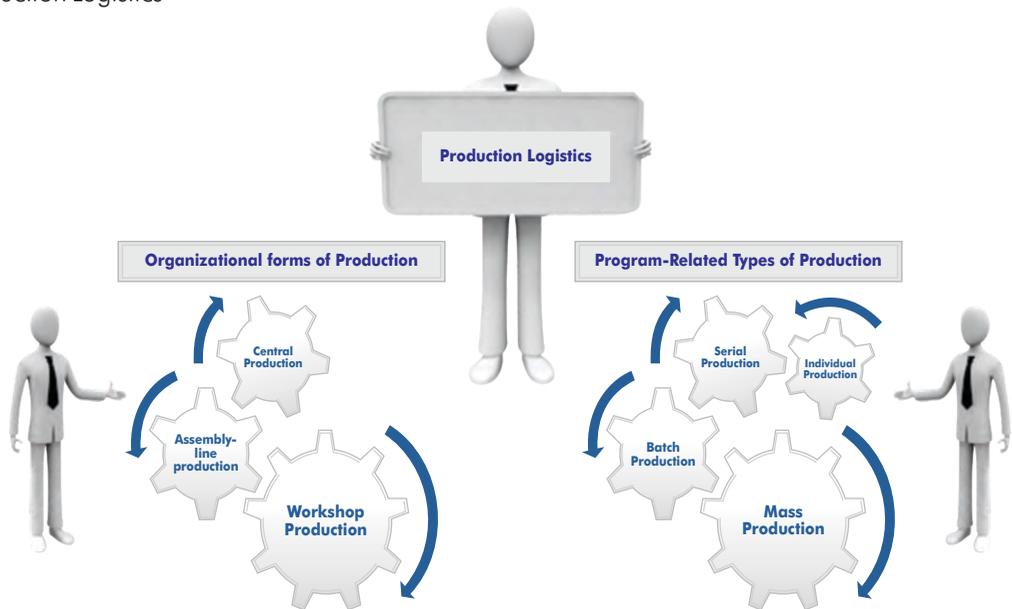
Dear Readers,

The subject "Production linked to Logistics" does not sound so exciting compared to the current "in vogue" industries such as E-commerce, Luxury, Cloud Computing!! Really mundane words remain "Production" & "Logistics".

However, I could not digest the same. Today Goods & Products (not considering Services and Software here) need to reach the ultimate consumer cutting across raw materials, semi-finished goods and finished goods to consumption points.

So I take upon myself to make you readers to believe and accept that "Production Logistics" is the backbone of our existence; "Roti, Kapada, Makan aur cell phone"!! have to reach everyone. So there has to be a story behind it.....lets unravel the clichéd words.

With your permission; the discerning reader; I don the character of "Mr. Guide" And walk you through the work that goes behind in the world of "Production Logistics"



We together cover the way logistics is done across Cement, Acids, Steel, Food Chain, Consumer Durables, Milk, Automobiles, Handsets and tie-up with relevant case studies.

Finally, we look forward to your valuable feedback so that we improve our offering to you.

Here we wish to thank each and every author who has taken time from their busy schedule and contributed immensely to this compilation. Also without the content team putting their effort the publication would not have been possible.

So thank you reader for joining me on the TOUR to the world of Production Logistics – here we go!!!!!!

With Best Regards

P C Sharma, President & CEO-TCI XPS



Mr. P. C. Sharma,
(CEO, TCI XPS)

Mr. P. C. Sharma is President and CEO, TCI XPS. He is heading TCI XPS a division of Transport Corporation of India Limited.

PC Sharma has completed AMP from Harvard Business School and GMP from National University of Singapore. He has completed B COM from Rajasthan University. He has attended MDP at IIM Ahmadabad and XLRI Jamshedpur, ISB Hyderabad and others.

He is the driving force behind sustained growth and success of TCI XPS. His vision is to establish TCI XPS division as one of the most admired and reputed names in the Indian express logistics industry.

about us



Transport Corporation of India is India's leading integrated supply chain and logistics solutions provider and a pioneer in the sphere of cargo transportation in India. Leveraging on its extensive infrastructure, strong foundation and skilled manpower, TCI offers seamless multimodal transportation solutions. An ISO 9001:2008 certified company, TCIL is listed with premier stock exchanges like NSE and BSE.

The company progressed from being a "One Man, One Truck, One Office" set up to becoming India's leading Logistics & Supply Chain Solutions provider with a Global presence. After 50 years, TCI moves 2.5% of India's GDP by value and is the proclaimed market leader of the Indian Logistics Industry.

TCI Group has an extensive network of over 1000+ company owned offices, a huge fleet of customized vehicles and managed warehouse space of 9.75 million sq. ft. and a strong work force of 5000+. With its customer-centric approach, world class resources, State-of-Art technology and professional management, the group follows strong corporate governance principles and is committed to value creation for its stake holders and its social responsibilities.



India's leading surface transport entity. This division provides total transport solutions for cargo of any dimension or product segment. It transports cargo on FTL (Full truck load) /LTL (Less than truck load)/ Small consignments/ Over Dimensional cargo.



A leading express distribution specialist. It offers a single window door-to-door & time definite solution for customers' express requirements. It services 13,000 locations in India and more than 200 countries abroad.



TCI SCS is a single window enabler of integrated supply chain solutions right from conceptualisation and designing the logistics network to actual implementation. The core service offerings are Supply Chain Consultancy, Inbound Logistics, Warehousing/Distribution Centre Management & Outbound Logistics.



TCI Seaways has well equipped ships in its fleet and caters to the coastal cargo requirements for transporting container and bulk cargo.



The global business division of TCI provides end-to-end logistics solutions across boundaries to various parts of the globe.

1

A GENERAL OVERVIEW OF production logistics

1. definition of production logistics

by **Mr. Y. M. Singh**, Director & Plant Head-Samsonite,

1. A GENERAL OVERVIEW OF production logistics

1. definition of production logistics: logistics before and after production

About The Author: Mr. Y. M. Singh, Director & Plant Head-SCM, Samsonite

He is heading the Supply Chain Department at Samsonite & the driving force behind the energetic team of Samsonite.

The application of logistics concepts to production is called production logistics. It covers all activities connected to the supply of production processes and delivery of products to the distribution warehouse. In this system, one interesting question is how a production line can be supplied from a company's own warehouse. For instance, can a system of unmanned vehicles supply the individual production steps? Or should every worker go to the warehouse and get the parts that he needs for the single product being assembled on his own workbench? Production logistics provides the answer about which approach is the best one.

Concept and scope of production logistics:

On one hand, production logistics includes all activities connected to the supply of production processes with feedstock - e.g., raw, auxiliary and operating materials as well as semi-finished products and purchased parts. On the other, it comprises all activities related to the transfer of semi-finished and finished products to the distribution warehouse. It is thus positioned between procurement- and distribution logistics and serves as the connecting stage. The interface to production logistics is formed by the incoming goods department or the provision of feedstock at the first stage of production. The transfer of finished products to the distribution warehouse or dispatch is the corresponding interface to distribution logistics

Optimization through system and total cost orientation:

The significance of system orientation in production logistics has often been neglected in the past. The interrelationship between production logistics and other logistics subsystems should be considered. An example is the delivery of production feedstock by suppliers directly to the first stage of production. In this instance, decisions in the area of production have a direct impact on the interface to procurement logistics.

Total cost orientation is of special importance particularly because of its close link to production and logistics processes. One typical example is measures to cut inventories in production. They generally result in reduced production lot sizes, more frequent changes of the products that are made and increased change-over times. As a result, higher lot size costs are juxtaposed against lower inventory costs.

The Guide:

No wonder JIT became the need of hour!!!



Five Signs Your Production Logistics Needs Help:

Production logistics solutions guarantee an increase in production efficiency by taking away non-value adding operations and bottlenecks, and cutting throughput time by as much as half. The solutions increase our customers' total efficiency by reducing waste and energy consumption per produced unit, reducing the environmental impact of the operations.

There are primarily three ways to increase the profitability of a manufacturing unit:

- Increasing the sellable throughput
- Reducing operational costs
- Reducing working capital

Increasing the sellable throughput:

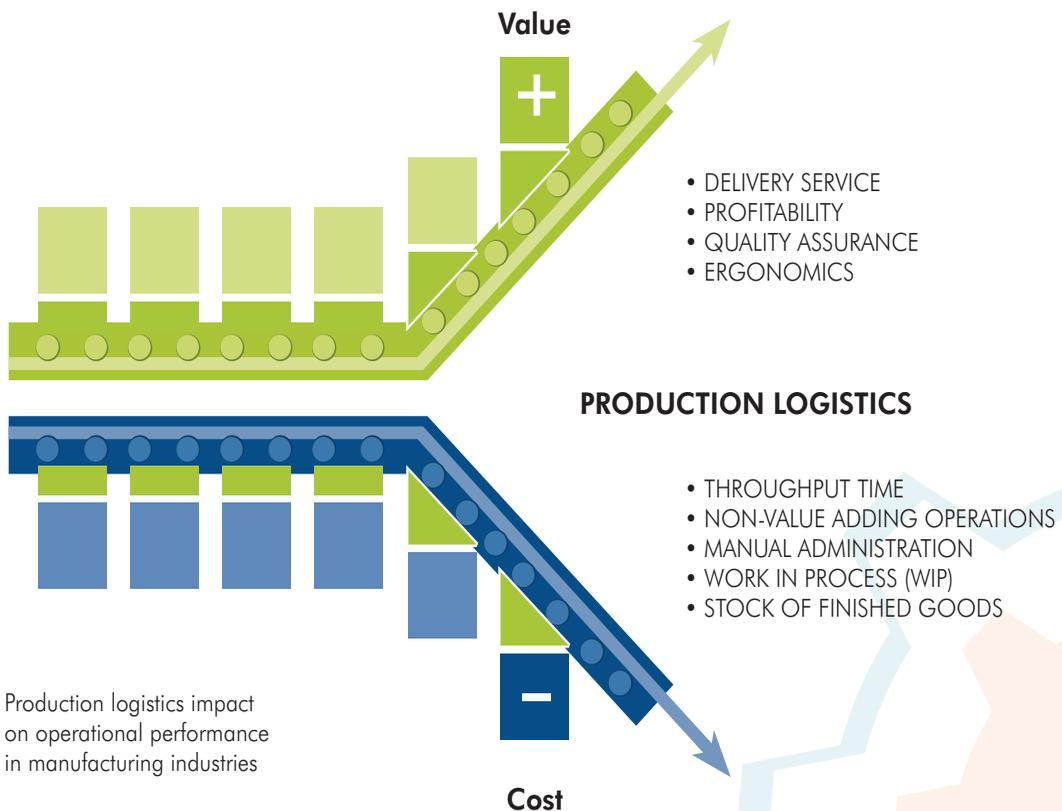
- Reducing bottlenecks by balancing the production flow
- Reducing process waiting time
- Reducing change over time increases the line flexibility and available production capacity
- Improving quality assurance and increasing yield – less waste

Reducing operational costs:

- Reducing manual administration
- Minimizing non value adding operations
- Space efficient solutions, i.e. more capacity per factory m²
- After sales services, reducing Total Cost of Ownership (TCO)

Reducing capital employed:

- Reducing stocks of finished goods
- Reducing work in progress (WIP)



Production logistics impact on operational performance in manufacturing industries

Five Signs Your Production Logistics Needs Help:

Most manufacturers experience and address common inbound logistics challenges, but one area of improvement that many overlook is the discipline of production logistics — ensuring each machine and workstation is fed with the right product in the right quantity and quality at the right time.

As the crucial link that connects inbound materials to on-time delivery of outbound products, production logistics can increase an operation's efficiencies and save millions of dollars annually. By creating the right blend of technology, equipment, and disciplined processes, you will ensure materials get where they are needed to keep production flowing.

The million-dollar question is: when is it time to pay closer attention to production logistics? Here are five signs your production logistics may need improvement:

1. Myopic view of inventory. If line workers are struggling to find materials, your production logistics are definitely a problem. Another sign of trouble is repeatedly having too much or not enough inventory of an item. A third indicator is confusion about which supplier is delivering which item and when; this is often caused by too many hand-offs between suppliers before an item goes to production.

2. High inventory costs. Consistent high inventory costs often result from keeping more inventory on hand than is needed, which increases working capital and reduces inventory turns. High inventory costs may also result from unnecessary freight costs, especially if multiple suppliers feed the plant. The root problem for all these high costs might be traced to poor visibility or poorly conceived and executed production logistics processes.

3. Right time, wrong part. It's good when parts arrive at the production line when needed—but not if they are the wrong ones. This error can occur for several reasons. The supplier might ship the wrong part to the plant, but workers add it to inventory anyway. Someone may key the wrong data into a spreadsheet as part of a manual process for inventory tracking. Or a supplier's IT system may not be in sync with the plant's IT systems that connect materials sourcing and production.

4. Damaged goods. Production logistics problems might cause damaged parts and supplies—or worse, a damaged end product. Damaged items are often the result of too many hand-offs among suppliers, or too many workers handling parts and materials. It's simple math: the more touch points, the greater the potential for damage.

5. Line delays and stoppages. If the production line is delayed or stopped once, it's once too many. A pattern of delays illustrates the need to revisit production logistics, because the source of the problem might lie in poor inventory visibility, inventory errors, damaged parts or supplies, or any combination of these issues.



The Guide says -----Do Something

The biggest mistake some companies make is doing nothing. Don't ignore the signs of major problems that could be tied directly to production logistics and if the signs aren't clear—yet problems persist—considered having a production logistics expert evaluate the inbound materials flow from the time they arrive on site until they reach production. You might be surprised by the solutions available and the results they can deliver.

Employing a tool like "SIX SIGMA" for effective measurement and monitoring will lead to desired results and also "hidden gaps" surface. So this tool can be a true Friend and an honest guide!!



2

organizational forms of production

2.1: workshop forms of production

2. manufacturing logistics

by **Mr. Pramod Sant**, VP-SCM, Siemens,

2.2: assembly-line production

3. supply chain management of handsets

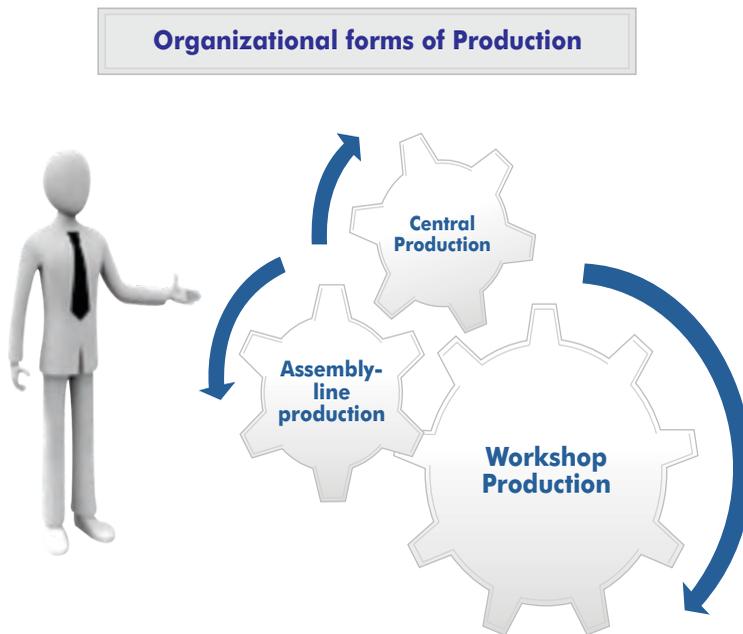
by **Mr. Rajkiran Kanagala**, Head - Group BD, TCI

2.3: central production

4. supply chain management in textiles

by **Mr. Govind Gupta**, Head-Logistics & SCM, Bombay Dyeing

2. organizational forms of production



One hundred years ago, Henry Ford invented the assembly line and optimized the principle of continuous flow production. With this idea, production costs could be significantly reduced. Still, 100 years later, an assembly line has not been set up in every business. That is because the design of production logistics depends largely on the organizational form of production. Based on the form, varying demands are placed on logistics within a company. The production processes of chinaware and cars are naturally different. The differences in the process-related production forms arise as a result of the organizational arrangement of product units and the structure of the production processes. This structure is based on the form and continuity of the material flow and the location of the products. In fundamental terms, three organizational forms of production can be identified - workshop, assembly line and central production. All production types have their own individual impact on production logistics.

The Guide:

Mr. Ford rightly said then "You can have any color car as long as it is Black in color", the genesis for mass production was set!!!!

2.1 workshop production:



2.1. Workshop production:

To produce chinaware, several workshops are needed to perform jobs like molding, grinding, decorating, firing and polishing. A workshop also covers the production units that perform the same types of manufacturing work and are located together in physical and organizational terms. In this work, processing steps are laid out for each type of chinaware. Every production job must be transported to the individual workshops in accordance with the sequence of the processing steps to be performed on the item. In the process, one job may have to be transported to the same workshop several times. This creates a large number of transports.

In workshop production, intermediate-storage inventories are often necessary because the transport of the material to the next respective processing site is typically done in a non-continuous manner in batches of various amounts. The

difficulty associated with precisely coordinating the work and transport processes so that jobs can wait on processing at a work system or on transport steps after processing is another reason for intermediate-storage inventories. Another problem is to optimally coordinate capacity needs and availability in terms of delivery deadlines

2. manufacturing logistics

About The Author: Mr. Pramod Sant, Vice President - SCM, Siemens

He has been working in Siemens since June 1989. He is the force behind complex logistics function at Siemens.

Effective logistics is an essential component of world class manufacturing. Optimal production schedules, yields and productivity are dependent on a predictable flow of inbound raw materials and components, real-time control and disbursement of materials into the manufacturing process in proper sequence, management of work-in-process (WIP) inventories, and the smooth flow of finished goods into distribution. Manufacturing Logistics solution tracks and controls the flow of materials throughout the manufacturing process and provides visibility from origin to final consignee for all ingredients, materials and components.



KEY benefits:

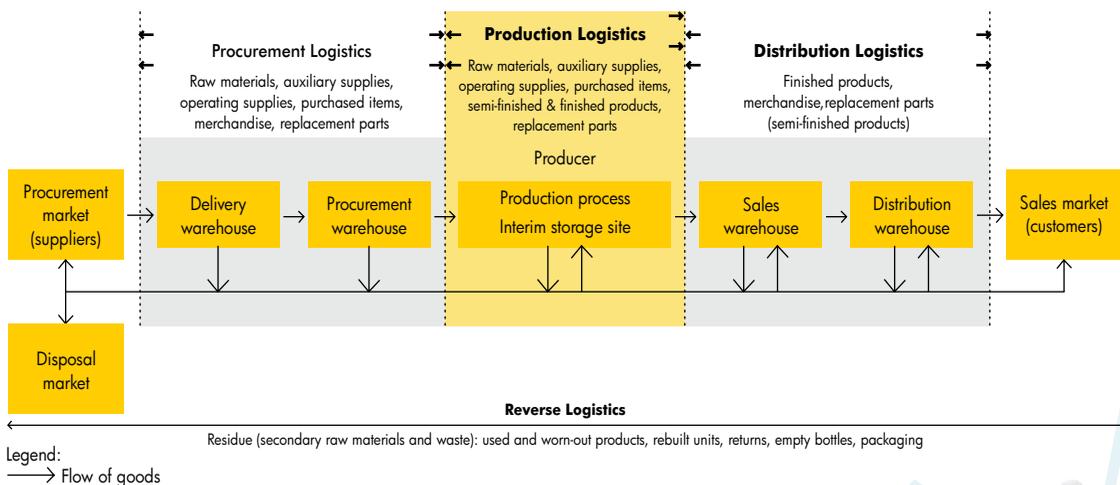
- Improved control and flow of raw materials and finished goods
- In-sequence delivery to production lines
- Increased production efficiency and accuracy
- Increased fill rates
- Visibility from origin to consignee for tracing and recall
- Better integration between manufacturing and distribution

Capabilities: Built upon an extremely robust data model that enables multi-level serialization and the flexible unit of measure conversion capabilities essential for raw materials and WIP support, this industry-leading system provides production line in-sequence delivery, error-proofing, raw materials and finished goods warehouse support, interfaces to palletizers and other production equipment, manufacturing cross-docking, comprehensive catch weight support, and many other capabilities essential to efficient manufacturing logistics flows.

Traceability/Recall: Complete visibility and traceability for all ingredients, raw materials, components and sub-assemblies from the supplier through production to the final customer. This includes support for country of origin, recipe ingredients, and nested serial number tracking. This provides a detailed, real-time data bank of information for immediate traceability and recall, ensuring you can accurately recover suspect product while avoiding costly general recalls that damage your brand and your bottom line.

Build-to-Order: Manufacturers' need to personalize products to customer preferences, delivering the right components to the production line in the right sequence, directing kitting and sub-assembly, error-proofing assembly, packaging and labeling, and providing a complete genealogy of parts and processes.

In Manufacturing Logistics you improved control and flow of raw materials, WIP and finished goods inventory, increased production efficiency, and reduced labor costs is very necessary. It provides a single source for visibility to all data related to products to meet the exacting needs of production, legislation and customers.

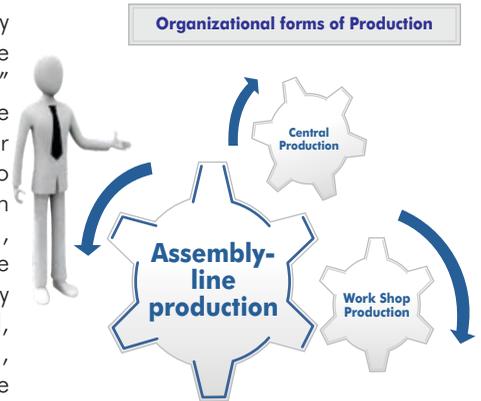
**The Guide:**

Like in any field without complete visibility across the value chain that too which can be only enabled by good software, IT & ERP system, it is very difficult to manage and tie both the Demand and Supply side of the requirements and manage operations.



2.2 ASSEMBLY-line production

Just like 100 years ago at Ford, cars are still made on assembly lines - in the process, the car passes through stations such as the "stamping facility," "body construction," "paint shop," "assembly" and "quality control." In assembly-line production, the productive units are organized according to product departmentalization or the work schedules of the products to be processed. In contrast to workshop production, shortages affect the entire production process as a result of the chain of production units. For this reason, material supply is governed by the requirement to have the feedstock permanently available. This, however, is constantly threatened by, among other things, downtime of working capital, an equipment breakdown or worker absences. For this reason, safety stocks must also be created. To continuously supply the production units, automakers frequently use the kanban system.



3. supply chain management of handsets

About The Author: Mr. Rajkiran Kanagala, Head- Group Business Development, Transport Corporation of India.

He looks after business development of all the divisions at TCI Group.

Handset Supply Chain is complex because of the speed required while reaching the customer as price erosion of the product catches up very fast while the inventory is being sold in the market place. So the word, Swift, Agile, Precise, Prompt, and Adaptability drives the entire business model.

Handset Supply Chain Management

A handset manufacturing company manufactures its mobile in 15 manufacturing plants located across 9 countries globally- Brazil, China, Finland, Romania and South Korea. Then it transfers to its mother depot which is located in Gurgaon. They also provide assistance in selection of channel partners like redistributors, Dealers, Franchisees, etc. Besides this they provide monetary assistance in Store development for This Handset manufacturer

Priority dealers, help in promotion of products on mass scale as well as in store and training of the sales force of partners at every level. With an extremely complex supply chain that handles 100 billion components, 60 strategic suppliers, and 10 factories worldwide, This Handset manufacturer had to be extremely focused in their transformation efforts. New product introductions and variations are also intense – 1 phone can represent 170 handset variations and 250 sales package variants. To support this complexity, the operations philosophy has been: think globally, act locally, i.e. balancing localized decision-making with global planning. This Handset manufacturer started its SCM transformation in 1995 with the strategy of replacing inventory with information and creating a pull-driven supply chain with end-to end integration linking suppliers, factories, telecom operators, channel partners, contract manufacturers, banks, sales, iHubs, and logistics service provider to the consumer. Their approach was to create the most efficient supplier network to offer the best solutions to meet customer expectations. Fundamentals for success included creating a value-based partnership with suppliers, based upon factual information, leadership, flexibility and trust - "Making the impossible possible through collaboration". Based on this approach, the supplier network is now considered the central point for reaching their corporate objectives: Great products, Operational excellence, and Customer satisfaction.



The results of their transformation have been impressive with increased sales and reduced component inventories not only within it , but also reduced inventories throughout the pipeline, including supplier and customer inventories. Sourcing excellence is a key ingredient for its business model transformation. Benefits include time-to-market, risk management, agility and financial model flexibility. This handset manufacturer believes two critical factors were instrumental to their transformation success: leadership and the communication of the vision. The leadership philosophy relies on four equally important elements: head, heart, hands, and guts. These leadership attributes are exemplified through energy and passion, trust as the base for business, focus and drive, active communication and finally, flawless execution.

Distribution Structure

This handset manufacturer rarely does divulge any kind of internal data in public domain. It makes it hard to get much detail about the exact details of the distribution structure of its mobile phones. This handset manufacturer has been market leader in mobile phones market not just in terms of sales by volume and value, but also in terms of setting best practices and examples in supplier selection. It manages one of the largest distribution network among mobile companies globally. It ranges from small village on island of some remote south-east Asia like Tahiti to advanced market like US and western European countries. Its mobiles are available at stores measuring barely 15sq. ft. in remote villages to super-sized Concept stores on high streets.

When it comes to distribution, its lead is clear. Today, India has some 1, 10,000 outlets that sell mobile phones. Out of these, according to companies own conservative estimates, 50,000 stores have only this brand available.

In India, This handset manufacturer started distributing its phones through a partnership, which had already built an extensive network for its own products. Recently, it has decided to supplement that with its own distribution efforts. This Handset manufacturer believed that there was a tremendous growth opportunity and it was best exploited when the resources utilization of both companies was optimized.

In recent years, it has started an initiative to allow customers to drop their used old mobiles in drop boxes for safe disposal. This has necessitated a reverse flow of handsets also.



Distributor

It follows similar pattern in different global markets of having tie-ups with companies with established network for the distribution of their mobile phones.. These distributors perform multiple roles within the supply chain. They act as resellers for the GSM phones.

Retailers/ Dealers

Its Priority dealers, Multi brand and individual dealers in any specified region are all served by designated RDSS. Dealers are explained the features of every new launch mobiles, different schemes and offers by its representatives. Re-supplies are always just a phone call away and the delivery is made within a few hours. Besides, it assists most dealers in the region in the store set-up and design. The price points

sometimes dictate the type of outlet. Stock norms define that for how many days worth of stock does any level in the supply chain should have. Given below are the stock norms: The expected target to be fulfilled by the particular level is determined by the following formula: $\text{Expected target} = (30 / \text{No. of working days}) * \text{Stock Norm for that level}$

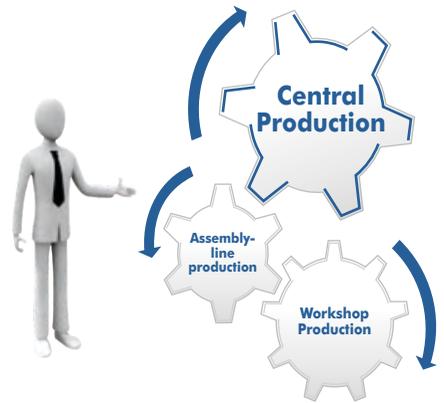
The Guide:

Nature says “what goes up, comes down”, the same in business unless, one innovates constantly and stays ahead in the race at the market place. However good you may be in production logistics, product acceptability in the market place remains the ultimate driver and the customer, for the implementation of the back bone for Production Logistics ----- so debate is rested “Demand drives Supply”.



2.3 central production:

Similar to workshop production, production units are bundled in groups in the case of central production. But all production equipment within the group is organized according to the continuous production principle. The aim is to optimally use the advantages of workshop and assembly line production. The physical centralization considerably shortens transport distances and can reduce the necessary transports required to create a product or to process a job. The benefits of central production are reduced waiting times for jobs and the inventories linked to them in the intermediate-storage facilities as well as shortened throughput times. In addition to production responsibilities, workers employed in a production island also handle transports to and within the production island, as well as the transfer and the storage of the material.



4. supply chain management in textiles

About The Author: Mr. Govind Gupta, Head-Logistics & SCM, Bombay Dyeing
He is heads Logistics & SCM division at Bombay Dyeing and has been instrumental in establishing best & effective practices across the supply chain.



Supply chain management (SCM) is the oversight of materials, information, and finances as they move in a process from supplier to manufacturer to wholesaler to retailer to consumer. Supply chain management involves coordinating and integrating these flows both within and among companies. It is said that the ultimate goal of any effective supply chain management system is to make products available when needed.

Supply chain management flows can be divided into three main flows:

- The product flow
- The information flow
- The finances flow

The product flow includes the movement of textiles from a supplier to a customer, as well as any customer returns or service needs. The information flow involves transmitting orders and updating the status of delivery. The financial flow consists of credit terms, payment schedules, and consignment arrangements. Some SCM applications are based on open data models that support the sharing of data both inside and outside the enterprise (this includes key suppliers, manufacturers, and customers of a textile manufacturing company). By sharing this data “upstream” (with a company's suppliers) and “downstream” (with a company's clients), SCM applications have the potential to improve the time-to-market of products, reduce costs, and allow all parties in the supply chain to better manage current resources and plan for future needs. Supply chain management is typically viewed to lie between fully vertically integrated firms such as Reliance who produce the raw material – polyester yarn and also the finished product - Bombay Dyeing a single firm and those where each channel member operates independently. Coordination between the various players in the chain is key in its effective management.

Supply chain decisions

The decisions for supply chain management can be classified into two broad categories -- strategic and operational. As the term implies, strategic decisions are made typically over a longer time horizon. These are closely linked to the corporate strategy and guide supply chain policies from a design perspective. On the other hand, operational decisions are short term, and focus on activities over a day-to-day basis. The effort in these type of decisions is to effectively and efficiently manage the product flow in the “strategically” planned supply chain.

There are four major decision areas in textile supply chain management: 1) location, 2) production, 3) inventory, and 4) transportation (distribution), and there are both strategic and operational elements in each of these decision areas.

Location decisions

The geographic placement of production facilities, stocking points, and sourcing points is the natural first step in creating a supply chain. The location of facilities involves a commitment of resources to a long-term plan. Once the size, number, and location of these are determined, so are the possible paths by which the product flows through to the final customer.

These decisions are of great significance to a firm since they represent the basic strategy for accessing customer markets, and will have a considerable impact on revenue, cost, and level of service. These decisions should be determined by an optimisation routine that considers production costs, taxes, duties and duty drawback, tariffs, local content, distribution costs, production limitations, etc. Although location decisions are primarily strategic, they also have implications on an operational level.

Production decisions

The strategic decisions include what textiles to produce, and which plants to produce them in, allocation of suppliers to plants, plants to customer markets. As before, these decisions have a big impact on the revenues, costs and customer service levels of the firm. These decisions assume the existence of the facilities, but determine the exact path through which a product flows to and from these facilities.

Another critical issue is the capacity of the manufacturing facilities--and this largely depends the degree of vertical integration within the firm. Operational decisions focus on detailed production scheduling. These decisions include the construction of the master production schedules, scheduling production on machines, and equipment maintenance. Other considerations include workload balancing, and quality control measures at a production facility.



Inventory decisions

These refer to means by which textile inventories are managed. Inventories exist at every stage of the supply chain as either raw materials, semi-finished or finished goods. They can also be in-process between locations. Their primary purpose to buffer against any uncertainty that might exist in the supply chain. Since holding of inventories can cost anywhere between 20 to 40 per cent of their value, their efficient management is critical in supply chain operations. It is strategic in the sense that top management sets goals.

However, most researchers have approached the management of inventory from an operational perspective. These include deployment strategies, control policies --- the determination of the optimal levels of order quantities and reorder points, and setting safety stock levels, at each stocking location. These levels are critical, since they are primary determinants of customer service levels.



Transportation decisions

The mode choice aspects of these decisions are the more strategic ones. These are closely linked to the inventory decisions, since the best choice of mode is often found by trading-off the cost of using the particular mode of transport with the indirect cost of inventory associated with that mode. While transportation by sea or rail is cheaper, it necessitates holding relatively large amounts of inventory to buffer against the inherent uncertainty associated with them. Therefore customer service levels and geographic location play vital roles in such decisions. Since transportation is more than 30 per cent of the logistics costs, operating efficiently makes good economic sense. Shipment sizes (consolidated bulk shipments versus Lot-for-Lot), routing and scheduling of equipment are key to effective management of the firm's transport strategy.

Supply chain modeling approaches

Clearly, each of the above two levels of decisions require a different perspective. The strategic decisions are, for the most part, global or "all encompassing" in that they try to integrate various aspects of the supply chain. Consequently, the models that describe these decisions are huge, and require a considerable amount of data. Often due to the enormity of data requirements, and the broad scope of decisions, these models provide approximate solutions to the decisions they describe. The operational decisions, meanwhile, address the day to day operation of the supply chain. Therefore the models that describe them are often very specific in nature. Due to their narrow perspective, these models often consider great detail and provide very good, if not optimal, solutions to the operational decisions.

Network design methods

As the very name suggests, these methods determine the location of production, stocking, and sourcing facilities, and paths the product(s) take through them. Such methods tend to be large scale, and are used generally at the inception of the supply chain.

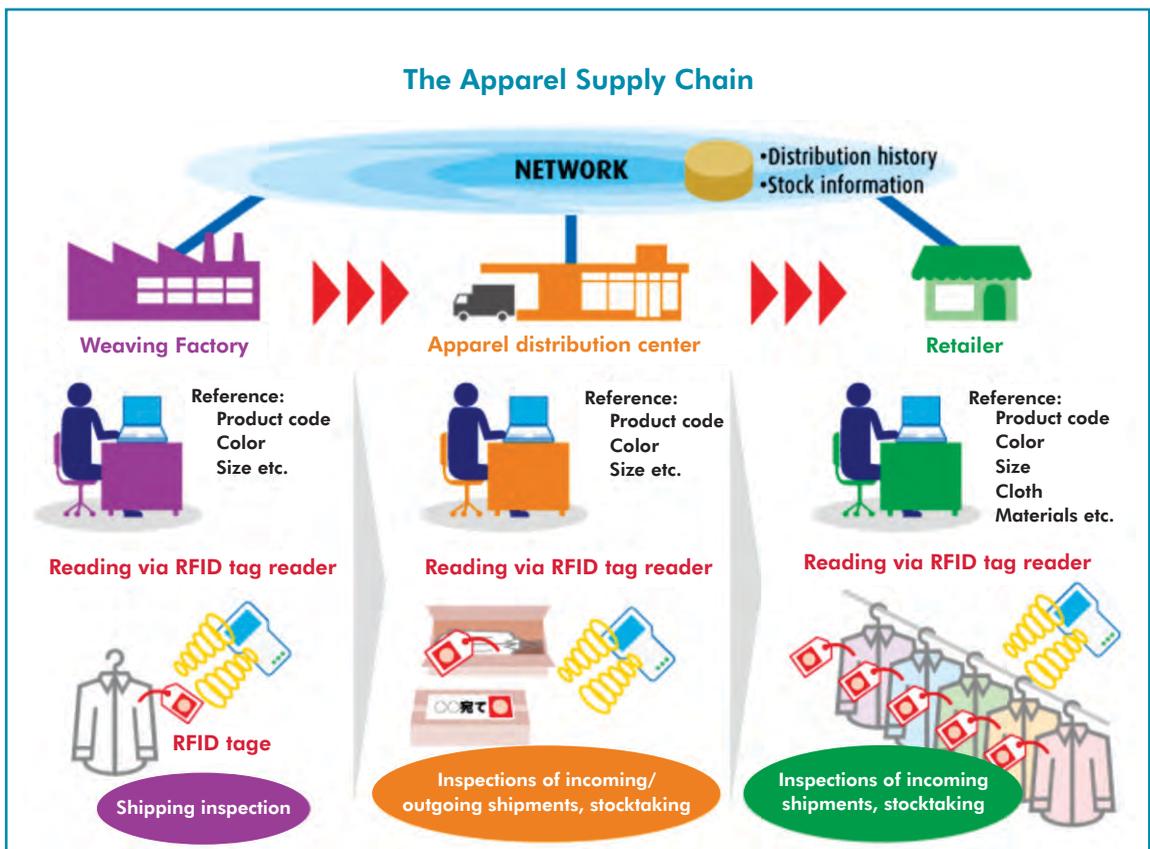
Cohen and Lee present a normative model for resource deployment in a global manufacturing and distribution network. Global after-tax profit is maximized through the design of facility network and control of material flows within the network. The cost structure consists of variable and fixed costs for material procurement, production, distribution and transportation. They validate the model by applying it to analyse the global manufacturing strategies of a textile manufacturer.

Clearly, these network-design based methods add value to the textile firm in that they lay down the manufacturing and distribution strategies far into the future. It is imperative that firms at one time or another make such integrated decisions, encompassing production, location, inventory, and transportation, and such models are therefore indispensable. Although the above review shows considerable potential for these models as strategic determinants in the future, they are not without their shortcomings. Their very nature forces these problems to be of a very large scale. They are often difficult to solve to optimality.

Strategy of the supply chain

With comprehending the need of the first changing business environment in textile, apparel and in the supply of raw materials such as polyester, cotton, etc, it requires proper business and planning strategy without which the supply chain management will not be successful. The following are the strategies and planning:

- Foresight of the business, ie, right idea, right supply at right time.
- Proper market survey for the customers' requirements, demand and supply.
- Proper production planning at supply end and that of consumer end with proper information technology.
- Product consignment to match the demand supply curve.
- Business expansion strategy.
- Marketing and distribution strategy.
- Strategic industry studies.
- Predicting industry trends.
- Market entry strategy.
- Financial planning.
- Market feasibility studies.



- Strategic Alliances.
- Mergers and acquisitions.
- Tap management recruitment/training.

The concept of supply chain management

The concept should be the following for a fruitful supply chain management:

- Timely delivery at customer's end.
- Proper quantity to reach at destination.
- Intact material.
- Reasonable cost.
- Customer must not suffer because of non-availabilities of raw material.
- Even the small quantity must not matter in reaching at customer end.
- With proper planning the raw material dispatch should be in such a way that customer must not suffer because of any delay or unforeseen incidences such as road condition, traffic jam, etc.
- Although, there are frequent changes in fashion trend which leads to unpredictable market situation but with proper policy matters distribution system, right communication, production lanning, the customer must get the required quantity of materials at its door step within stipulated time.

The difficulties faced at supply chain

The following difficulties are being faced in supply chain in textile industry for yarn, cloth, apparel, garment, industrial yarn, etc.

- Distance: Larger the distances, larger are the difficulties in reaching the materials at proper time at customers end.
- Improper production planning at both manufacturer and consumer end. It becomes more erratic when there are fluctuations in demand of consumer product.
- Transportation cost: Larger the distance, larger is the transportation cost, some customers are not in a position to get the right raw material from the right resource because of high cost of transportation.
- Government policies

- Taxation
- In case of rise in market demand, the supply becomes more critical because of non-availability of trucks, manpower and resource problem. At that time, the manufacturers are unable to cope up with the growing demand of their customers need because of their limited capacity. In such case a thorough vision in planning is must to maintain demand supply. Outsourcings are being done to meet the demand supply through proper supply chain. In such cases the transporters, the concerned loaders and unloaders start demanding more wages disturbing the chain link.
- In case of increasing the uncertainty in the international market, the customers start stocking of the materials and hence, subsequent problems arise in logistics and distribution. At that time, it is necessary to see customer profile, his routine demand & accordingly distribution is made. Importance's are being empathized on valuable customers for up keeping the customer's business online.
- Sometimes any special customer needs any special product at remote place where logistic becomes difficult but fulfill the customer need it requires to know the presence of other customers in the nearby areas, so that proper distribution can be made at a reasonable logistic cost.
- During off-season, say in heavy rain, bad road condition, natural calamities, etc, it becomes difficult to dispatch the material at customers end in time but to keep the supply chain on, adequate materials are being dispatched by keeping the proper information with the dealers and the customers.

Proper implementation

There should be proper implementation of the chain management to keep the production on & to minimize the cost of production. The manufacturer must have:

- Engineering concept.
- Machinery evaluation.
- Architectural & structural details.
- Humidification, gas & energy consultancy.
- Civil & electrical & water management.
- Fire fighting & safety system.
- Improved designing & work practices.
- Process audit & benchmarking.
- Process improvement & optimization.
- Complete project management.
- Advance analytical method of training.
- Management training & development.
- Quality assurance systems.
- Improving the planning process.
- Establish performance monitoring tools through application of IT solutions.
- Establish business targets.

Mode of transportation

For a perfect supply chain management the mode of transportation is an essential integrated part, which can be international or inter-modal. It can be either by ship, train, truck, inland barge. In the worst scenario,

- Sea transport by container is 72 to 73%
- Rail transport 3 to 14%
- Road transport 14% to 24%

Difficulties faced in transport during supply chain

1. Road transport/Surface transport

- Within India the majority of the supply chain is done through road transport and the following are difficulties faced:
- Non-availabilities of proper type of trucks to load the required quantity of the customer. For example, in India

80% trucks are Punjab body (both sides closed), which makes difficulties in loading the trucks through Fork Lifter from all sides. It becomes time consuming, chances of material damage, less quantity loaded than the standard practices and enhanced costing. Because of road conditions materials get damaged even with proper packing and it creates misunderstandings among the suppliers and customers.

2. Sea transport

- It is the cheapest and the best way to send the materials from one country to another. But because of certain policy matters, some times the consignment gets delay from the manufacturers end to Port.
- Then it is transported either by truck or by train, which creates more material handling and damage. It requires proper implementation of supply chain management.

3. Rail transport

- It is cheaper but time consuming.
- The customers need to wait for the loading/unloading operation at goods yard.
- During monsoon, etc, the textile material has got the bad impact if proper care is not taken in time.
- Some times it takes more time to reach the destination and customers suffer.

Conclusion

1. With the growing demands of material and that of business, the Supply Chain Management has taken an important role throughout the world.
2. It has taken its own shape in the textile industries where large quantities are in demand with varieties of product range.
3. In the textile industries, there are high market fluctuations which make the Supply Chain more critical and hence an appropriate management is required in this industry.
4. The cost of diesel and fuel price has also direct impact on this Supply Chain and the management needs to be more systematic.
5. At every stage of demand and supply, proper production planning is very much essential.
6. At production stage, the technical and commercial aspects are to be taken care of in order to keep the supply chain intact.

The Guide:

Competition is immense in this industry both at organized as well as from unorganized front, so one has to manage to "cover" all fronts smartly while being frugal overall across the supply chain.



3

program - related types of production

3.1: mass production

5. cement logistics: A cost-effective approach

by **Mr. Jayant Sastry**, Director-Logistics, ACC

3.2: batch production

6. consumer electronics manufacturing footprint in india

by **Mr. Ravindra**, Head-Logistics & SCM, Panasonic

7. pharmaceutical supply chain-indian perspective

by **Mr. Rajkamal Bhatia**, Director - Supply Chain & Distribution
SANOFI PASTEUR India Pvt Ltd.

3.3: serial production

8. the peculiar challenges of chemical supply chain logistics in india

by **Mr. Ranbeer Chaterjee**, Head - Logistics, Linde India Ltd.

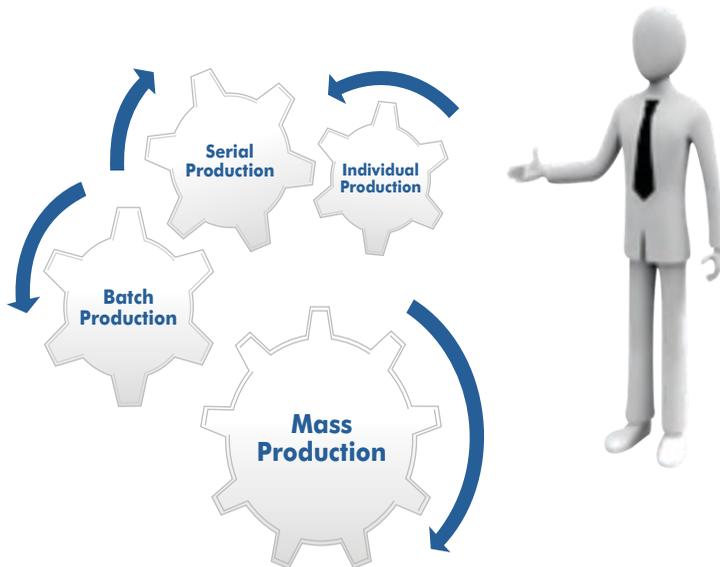
3.4: individual production

9. the logistics of liquid bulk (wine)

by **Editorial**

3. program - related types of production

Program-Related Types of Production

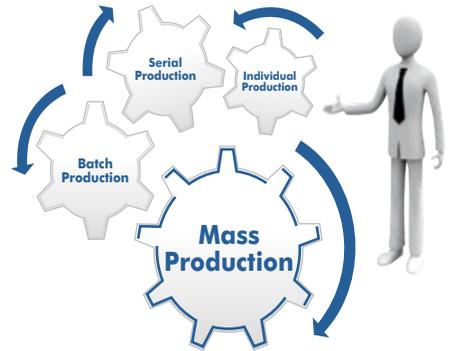


Program-related types of production focus on the products to be manufactured. Features of the various types include the product characteristics, the number of manufactured items and the size of the production run. As a result, items like beer, shoes, cars and airplanes are not made by the same type of production process. In fundamental terms, the types of production can be broken down into mass, batch, serial and individual processes. The selection of a type of production has a direct impact on production logistics.

3.1 mass production

3.1. Mass production

Products like beer and cement are mass produced. In mass production, it is the job of production logistics to supply the production units with the same feedstock for long periods of time. A key requirement here is a logistics system that, through a high level of mechanization, can continuously run as smoothly as possible



5. CEMENT LOGISTICS: A COST-EFFECTIVE APPROACH

About The Author: Mr. Jayant Sastry, Director-Logistics, ACC

An expert with more than 30 years of experience in cement & fertilizer marketing, sales and Logistics. worked in Coromandal Fertilizers and now with ACC, India,

With the industry showing a downward trend in profit margins, better logistics management proves beneficial to many of the cement manufacturers. Jayant Sastry, Director-Logistics, ACC, explores the various modes of logistics that can provide a cost-effective means of cement transportation.

Cement, being a bulk commodity, transporting is a costly affair. The selling and distribution costs account for around 18 per cent of sales revenues. In 2009-10, top 30 cement companies spent more than Rs 10,000 crore to carry cement to the consumer. The domestic cement industry has been making continuous efforts to cut its logistic costs.

At the time when the industry was entering into the downside of the cycle, with profit margins coming down to 20-25 per cent from 35-40 per cent, better logistics management proved beneficial to many of the cement manufacturers. Using more railway routes than roads, shrinking lead distance (distance between the manufacturing facility and market) and opting for sea-routes wherever possible were some of the ways the industry explored. Currently, for every 50-kg bag of cement, the logistic cost comes to around Rs 18-25 by road and Rs 12-15 by the railway, depending on the distance. For example, the country's third-largest cement maker, Ambuja Cements, opted for sea-routes to transport its cement from Gujarat to southern market.

Today, 70 per cent of the cement movement worldwide is by sea compared to just 1-2 per cent in India. However, the scenario is changing with most of the big players like L&T, ACC and Grasim having set up their bulk terminals.

About 3 per cent of the gross revenue is spent on inward logistics while outward logistics accounts for another bulk of 15 per cent. Inward logistics include, coal and limestone transportation, while outward logistics is mostly the final product cement. Some companies also incur outbound logistics cost on transporting clinker to their





grinding plants. Plants that are closer to the collieries, the inbound transportation costs are less. For plants located far away from the collieries they have the option to import coal.

While the freight cost could be optimised on the imported coal through usage of company's own ships for part of the quantity, the international prices of imported coal and its volatility together with the strengthening of the dollar against rupee could derail this. This could impact the delivery prices of imported coal and also the cost of production.

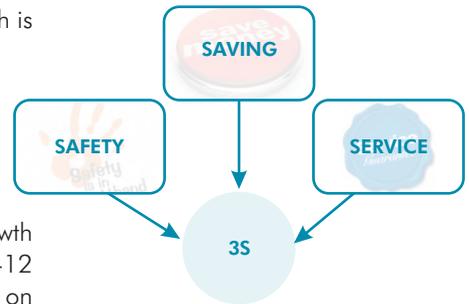
In case of final product, the costs of handling and secondary movement are very high. Although transportation by sea is the cheapest option, unless there is right connectivity from the port to the consuming centre the gains are minimum.

Companies, which have plants located closer to the markets as well as to the source of raw materials have an advantage over their peers, as this leads to lower freight costs. Also, plants located in coastal belts find it much cheaper to transport cement by the sea route in order to cater to the coastal markets such as Mumbai and the states of Gujarat and Tamil Nadu.

Checking logistics costs is an ongoing process for the cement companies. Many are trying to reduce the costs by around 5-7 per cent by optimising the distance of transport. Statistics suggest that about 45 per cent of the cement produced in the country is being transported by the railway. Cement makers prefer roads for shorter distances.

There are 3 core focus area in current Cement Logistics in India which is called as 3-S of cement Logistics.

- ✓ Safety
- ✓ Saving
- ✓ Services



Looking ahead

With demand for cement expected to remain strong in 2011 with a growth of over 10 per cent, the logistic activities are in for a boom. In the 2011-12 fiscal, additional cement capacity of 27 million tonne is likely to go on stream. With the bulk of the capacities coming up in the South, the demand supply imbalance in 2011 would continue to be a cause of concern in the South, though it is expected to improve or remain in a status quo position in other regions.

The dwindling availability of coal linkage and the move to sell high grade indigenous coal at international prices are likely to impact power and fuel costs. The prices of other major inputs mainly slag, gypsum and fly ash are likely to further harden in 2011, whilst the increase in petroleum product prices would continue to impact freight costs. A shortage in railway wagon availability may adversely impact despatches in peak months.

The Indian cement industry is the second largest in the world after China, with a total capacity of close to 300 million tonne and plays a major role in the development of the Nation. Therefore, considering the role of Industry in the economy's development, it is necessary to incentivise bulk transportation and thereby optimize cost, save fuel and reducing carbon emission while ensuring safe carriage.

Railways to levy surcharge

Indian Railways will levy a surcharge of up to 7 per cent from 1 April to earn a higher freight earning during busy season. The move is likely to add to the inflationary pressure on the economy even as finance ministry is expecting a lower inflation during 2011-12.

As per the railway decision, a surcharge of 5 per cent will be charged on coal and coke group, while all other commodities will attract a busy season charge of 7 per cent. Container traffic has been exempt from any such charge. Railway considers the entire year barring July-September of every year as busy period.



In 2010-11 also, railways had increased freight rates of iron ore, coal, sugar, cement, steel, potash, coke and some petroleum products.

Railways has also decided to levy a congestion charge of flat 20 per cent on traffic to neighbouring Bangladesh and Pakistan. The measure has been taken to encourage faster clearance of rakes at the borders.

Logistics cost reduction cannot be the sole objective and seen in isolation by the cement industry. The most important part is the service. At the end of the day, if one is unable to serve the customer he will never be in the industry.

How do you evaluate logistics in cement industry?

Logistics costs are going to come down provided one is on the right track. If he chases cost in isolation by just working in cost reduction, he cannot reduce cost in an inflationary world. The process of cost negotiations of olden days are over now. Under negotiation, one arrived only at the lowest quoted price and was content assumingly to have reduced the cost. Here, he only arrives at the best negotiated prices but not at a best cost. Today the concept of negotiation is no more prevalent. If one wants to work the truck freight to a particular destination, the right cost should take into account all the statutory duties, all the toll taxes, fuel cost, and all other allied cost, cost of vehicles, turnaround efficiency, everything. These known efficiency parameters should be arrived at the right price. Here the cost can be reduced only by increasing the efficiency.

The second most important factor is to use technology to the helm. The real time visibility is the key to success. Through technology one can find whether the truck is detained, which route is appropriate, entry restriction, etc. Technology plays a key role in aligning these activities.

Further, logistics safety and occupational health may be termed as priority One in today's logistics, as the loss time and loss of lives in vehicle related incidents is the highest. Also, customer service is the mantra for any cement logistics officer.

So Mr. Sastry, can we do a tete-a-tete over Coffee and not at a Cement Warehouse, coming to some serious questions:

What are functional bottlenecks?

In the old system, the key was to have a godown and the evacuation quantity used to be very small. Today one rack carry 3,800 metric tonne as against 1,700 to 1,800 metric tonne earlier. Now the size has almost doubled. Unfortunately in India, evacuation resources have not kept pace with the requirement. Most goods sheds are under control of the union, the fleet size has not expanded as per the growth of the cement business, labour is controlled by the union, labour availability has not increased as per the increment in volumes.

There is no mechanisation process in India, in spite of the wishes of the industry. Here the government has to play an active role. Industry on its own cannot make mechanisation happen. It should be a collaborative effort. Mechanisation, in the short run will create turbulence, but in the long run everybody will be benefitted. People need to be educated and prepared to face these short term turbulences.

What is your estimate of losses due to prevalent evacuation system

Mechanisation can alone reduce cost by a minimum of 10 per cent. The company could currently evacuate 3,000 tonne by manual route from goods shed, just because systems are not mechanised. Going ahead, labour in India will become a scare commodity, so one should be prepared for such eventuality in 2015-2020. The industry will have to join hands and take up a pilot project. It has to be a collaborative effort.

This has driven the logistics to almost 15 per cent of total cost which is very high by global standards given the volumes.

Logistics cost in India is going to come down a) efficiency b) technology is the key c) mechanisation is another area d) last but not the least, people should know the right cost. There has to be organised movement of transport. Every truck coming to Mumbai should log-in at the octroi point, when they are going back from Mumbai and in which destination they want to go. Those people who want to send material to that location can also log-in. So it can be marriage of both, need



business and who are willing to give business. Today only brokers are there in this field. They are making money by non-visibility of information. That cost of brokers is unnecessarily borne by the company and the end-user. Make a transportation where every information is visible. Let people log-in and say we are interested in transporting our good.

Railways haul about 40 per cent of cement, what are the bottlenecks there?

Railways has very good system, which gives real time visibility. On technology front, the railways has done a great job. Per se, for any bottleneck railways cannot be blamed. It continues to be a socialistic set-up and at the pace at which the economy is growing the railways has limited resources. Railways have increased the number of trains but where are the tracks. This has to move parallel. Every year railways add 100 of passenger and goods trains, running on the same track. It is not railway that is slow it is a general problem in the country. The time taken to conceive a project and to execute that project is huge.

What are the inwards and outwards logistics, the cost proportion?

In cement industry, inward logistics costs are about three per cent of gross revenue and outbound close to 15 per cent. Clinker going to grinder it is outward.

The share of Bulk cement and Ready Mix concrete is on the increase in a developing economy like ours. These two new product deliveries will enable more mechanized and efficient logistics besides reduction in packaging and handling costs.

What are preferred modes of transportation of cement?

Roads are cheaper up to a lead of 300 km, over which it is railways. Sea route is the most economical. But in India sea route is viable only on the west coast, where limestone and markets, both are available. On the east cost the problem is that the regions does not have limestone. In Gujarat limestone is available bang on the coast. Sea route is economical but not available across.

What are the new challenges in road transport?

The toll taxes are a concern now on roads. There has been a progressive increase in the toll rates and the number of points. On a stretch on 200 km there a 5-6 toll points, which hinders speed. This has resulted in increased cost and time. There is an urgent need for high tech toll booths.

What is the focus on logistics going ahead?

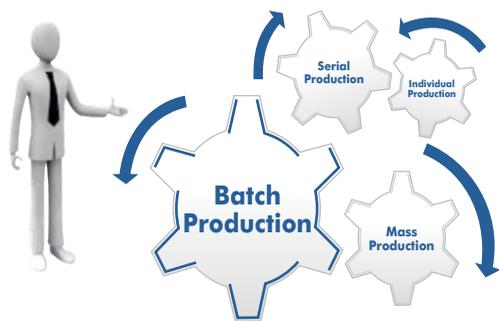
Every industry has its own efficiency levels and are trying to address them in different ways. In cement, per se, volumes have gone up and in spite of all these limitations the thrust is to move towards better services.



The Guide:

Thanks. Really insightful, the industry indeed has many challenges which are not visible in the “dust” created by the nature of product!! One has to be calm, innovative and on the move always to be ahead in the rat race.

3.2 batch production



Shoes, gummi bears or fruit yogurt are also mass produced - but the batch is changed. In batch production, a special type of mass production, the production process must be interrupted every time a batch is changed and the production facility must be switched to handle the new batch. Logistics-relevant problems are the determination of the batch sequence and the production lots, which affect the size of the warehouse stocks

6. consumer electronics manufacturing footprint in india

About The Author : Mr. Ravindra, Head-Logistics & SCM, Panasonic

He is heading Logistics and supply chain functions at Panasonic & has taken up the challenges to establish a global standard in a complex and competitive Indian market.

Panasonic India has been doing consistently well in the consumer electronics and home appliances segments. Despite the challenging economic environment and low consumer sentiments, because of which the durable industry could manage only single digit growth rate, Panasonic achieved a sales target of 101 percent with a relative growth of 170 percent Y-o-Y barely missing its target revenue of US \$1.5 billion for the last fiscal. The brand has witnessed a health growth of 200 per cent for the last three years in India and has gathered impressive market share especially in TV and AC segment.



That's quite impressive for a Japanese company, which didn't start off so well and continues to face still competition from well established Korean players (read LG and Samsung) in India. Panasonic India's President mentioned that his organization is 'not a Japanese company operating India but an Indian Company with Japanese roots'. This commitment of becoming an Indian company with strong focus on localization is what is working well for this white goods major.

Panasonic has learnt its lessons well after having suffered in the past for trying to sell in India TV's and ACs made for the US and European markets, by tweaking them. So it went back to the drawing board,

studied how Indian customer actually used the products, Focused on hardcore R&D, hired engineers who understood the market and then got products designed and developed specifically for this country. The result has been stunning. "In 2008, the market share for TVs (flat panel) and ACs was less than one per cent. It jumped into six per cent in 2010 for TVs and they are at 15 per cent today for ACs. In ACs Panasonic is no. 1 in states like Gujarat, Maharashtra, Tamil Nadu and Rajasthan. Today Panasonic is growing at 80-100 per cent rate in the split AC segment. "In flat panels, the company have about 10 per cent market share by next year; it has been a tough year for the industry but we are growing faster than the market".

India is a key growth market for Panasonic in its global scheme of things; it plays a vital role in the company's ambition in India. For example, it will have invested more than Rs. 800 crore at its Jhajjar plant by 2015 having started in 2010. "Also the company plan to invest Rs. 120 crore during FY2013-14 in the split air – conditioner segment with the aim to capture around 20 per cent of the market share by the end of the fiscal".

Localization has been the key for Panasonic's growth in India. The company has been specially conceptualizing and customizing our products for the Indian consumers keeping the local needs and conditions in mind. Modification of business, products and content should satisfy both the language and cultural differences of the targeted market. The stress of becoming an Indian company is a refreshingly different approach for a global company working in an emerging market. Despite their extensive worldwide footprints, companies from the

PANASONIC TECHNOPARK, JHAJJAR

The Technopark, Jhajjar, is Panasonic's first model 'eco ideas' factory in India and sixth in the Asia Pacific region. It not only manufactures eco-friendly products with sustainable industry practices, but also serves as an outreach platform for environmental education activities, in an effort to raise the level of eco consciousness within the community.

Location:	DadriToi, the Jhajjar Model Economic Township, Haryana
Total Area:	307,000 sq m
Production Started:	January 2013
Production Capacity:	1,000,000 sets of air conditioners, 400000 sets of washing machines and 25000sets of welding and cutting machines per annum
Revenue Targeted:	Rs. 25,000 crore by 2015
Market Distribution:	Domestic sales; export to middle East and Africa (5 per cent in 32013, increased to 20 percent by 2015)
Employees:	1,025; to reach 3,500 by 2018

developed world, religiously retain their national identities. Despite the frequent use of the phrase 'think globally, act locally', many times, a German company is a German company in essence and a Japanese company is exactly that. It may not done very overtly but the underlying character remains and the local market too is conditioned to accept this difference. So phrases like "This is German Technology" or 'This is British Engineering' or 'This is Japanese quality' are quite commonly heard on the shopfloor or the boardroom, clearly defining the 'us' and 'them'. So Panasonic's endeavors in realigning its identity with the local market are indeed welcome.

In terms of manufacturing, the localization efforts started with the setting up of an R&D subsidiary in India. This R&D centre functions in line with Panasonic's plans to make India a hub for the development of the products that will contribute to the future and help realize green innovation for a sustainable society. Through this initiative, the company introduced first-of-its-kind India specific innovation Cube AC which is split in form of window to suit the requirement of Indian households. Also Panasonic started the 'Sound for India' campaign, which marked the introduction of Panasonic's 32C22, the 32-inch LCD television. What differentiates it from the products made for the western market? This television is high on sound, very peculiarly an Indian requirement.

Panasonic endeavors to become the most trusted electronics brand in the country by providing smart and eco solutions to its customer that help to create value for them. With India surging ahead on its strong growth path, there is a fundamental shift in the consumption and buying behavior of 'core' Indian consuming class. 'Consumers today are not only looking for availability of products, but also want better experience, services and ambience'.

Opening of Panasonic's newest manufacturing unit – Technopark – in Jhajjar will help fuel the company's first priority goal of doubling revenue. "The company plan to achieve this by focusing on three core strategies: pursuing our company vision of becoming the number one green innovation company in the electronics industry by 2018; Integrating Indian expertise into our product design and manufacturing processes: and increasing focus on rural development to ensure that Panasonic India performs as a responsible corporate entity contributing to the equitable growth of the entire Indian society".

Interestingly, Panasonic is also keen to explore newer avenues in Indian to further its growth plans. "having established our strong presence in the consumer space, the company is looking at the business- to- business and business – to – government domains to be the next growth driver in India". The company realizes that there is huge potential in the space. Close to 50 percent of Panasonic's global business comes from this segment but in India, however, it contributes just about five per cent.

Currently the mainstay in India is the consumer durables market, which is very competitive and fragmented. The industry size as per CARE rating was about Rs400 billion during FY12 and CARE Research Forseees that it is expected to grow by about 4-5 per cent in the next two years. Within this market, this fiscal, Panasonic has grown 35 per cent in the LCD, Led and plasma television segment, 100 per cent in ACs and 125 per cent in home appliances.

Over the last few years, India has seen an increase in the awareness towards eco-friendly products. With the rising cost of fuel and power, the number of people using energy efficiency products has risen in recent years especially in metros. This provides an opportunity for business that are using 'eco-friendly, as a component of their value proposition. "at Panasonic, designers and engineers constantly endeavor to ensure that each evaluation of product is better than its previous version by following stringent process to develop products that are more energy

efficient, water efficient and long lasting.

The new manufacturing facility in Jhajjar will help improve the design and propel research and development of energy efficient products suited for domestic requirements. The plant imbibes the best of Panasonic's manufacturing and engineering know-how, quality management techniques, and supply chain management knowledge. Earlier the company used to import the products from Malaysia, Thailand and Japan to meet the huge demand here. Due to Technopark, the entire logistics process has now become more efficient and cost effective for Panasonic.

India is a well equipped with the requisite skills in the product, process and capital engineering which have eventually attracted foreign players to invest in the country. The importance attached to Electronic System Design and Manufacturing in the National policy of Electronics is encouraging.

Spurred by large domestic demand and with proactive support from government of India as well as increased co-ordination among industry players, Panasonic is hopeful that there is going to be a steady increase in research, design and manufacturing activities. The company will focus on making India a manufacturing hub and plan to export products from India to other markets starting with the Middle East and Africa region. The percentage of export of products from Jhajjar will be five per cent by 2013 and 20 per cent by 2015.

In recent years, India has strengthened trilateral ties with Japan through new initiatives and programmes ranging from economic and cultural linkages to defense and security. The company also believed that the FTA signed will also further strengthen the relationship between the countries. This will usher in a new era of economics engagement, which will bring development, innovation and also prosperity in both societies.

In 2007, Panasonic acquired Anchor, a major player in the electrical market. "After the Anchor acquisition the

PANASONICS MANUFACTURING FOOTPRINT IN INDIA

SR	PRODUCTS	PLANT NAME	LOCATION
1.	LCD	Panasonic AVC Networks India Co. Ltd. (PAVCI)	Noida, NCR
2.	Small Appliances	Panasonic Appliances India Company Ltd. (PAPIN)	Chennai, Tamil Nadu
3.	Carbon rods	Panasonic Carbon India (PCIN)	Chennai, Tamil Nadu
4.	Batteries	Panasonic Energy India Co. Ltd. (PECIN)	Vadodara, Gujrat
5.	Batteries	Panasonic Energy India Co. Ltd. (PECIN)	Pithampur, Madhya Pradesh
6.	ACs washing and welding & cutting machines	Panasonic Technopark (Eco Ideas)	Jhajjar, Haryana

company have consolidated and rationalized the manufacturing transformed some of its key processes, and strengthened the product design and quality. All of these are yielding good results. Teams in Panasonic India and Japan are working together with the anchor team in this evolution. Panasonic has also strengthened the Anchor sales infrastructure to enable efficient delivery and service. The company believes together Anchor and Panasonic should be able to supply all products that are required for conveying power, data, voice and security into a house or commercial establishment.

Daizo Ito was felicitated as the 'Man of Electronics' by the consumer Electronics and Appliances Manufacturers Association. The company sees huge potential in the Indian subcontinent and views it as a key growth market for Panasonic globally. The company believes that products which work well in international market such a US and Europe need not work for Indian consumers. That's why the company has focused on localization of products and technologies to suit the domestic requirements and will continue to do so.



The Guide:

Low margins and high volume of the product to manage makes the supply chain always complex.

7. pharmaceutical supply chain-indian perspective

About The Author: Mr. Rajkamal Bhatia, Director - Supply Chain & Distribution, SANOFI PASTEUR India Pvt Ltd.

He is Supply Chain & Distribution expert and in the same function for last two decades and have worked in almost all models of distribution.

Indian pharmaceutical industry was valued \$12 billion in 2012 including domestic production of drugs, exports and imports. Technical and infrastructure capabilities of pharma companies, cost effective production process and reduced time to market drugs due to domestic regulations are the key factors driving the growth of Indian pharma segment.

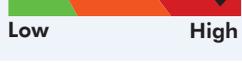
Indian API manufacturers produce close to 1000 APIs for various therapeutic segments such as oncology, anti-infectives etc. India has more than 120 FDA approved sites and close to 90 MHRA approved plants. Efficient infrastructure facility coupled with relatively reduced labour cost enables the Indian pharma segment to attract foreign direct investments (FDI). The FDI flow is also reflected in the form of increased partnerships – either through mergers or acquisitions, including that of Abbott – Piramal (2010), Strides Arcolab – Aspen (2010), Solvay Pharma – Abbott Capital (2010), Hospira – Orchid Chemicals (2010) etc.

India is viewed as one of the most preferred and cost effective outsourcing partners for pharma MNCs. Outsourcing of bulk drugs by big pharma is slated to grow by \$3 billion while the CMO market in India is expected to grow at a rate of 20 per cent till 2015. In terms of capacity, currently, the Indian pharma industry is operating at an average of 60-65 per cent. Henceforth, these major MNCs are planning to utilise the remaining 15-20 per cent for their outsourcing activities.

Indian pharma supply chain: Indian pharma supply chain follows a symmetric network with distributors, wholesalers and retailers occupying a major portion of the segment. However, it is different from the US supply chain in the following two aspects.

Insurance providers as ad hoc segment: US pharma supply chain has insurance providers as an integrated segment whereas Indian pharma supply chain is currently in an ad-hoc stage and not integrated completely with insurance providers and other service providers.

Increasing partnerships with medical device companies: Major pharma companies such as Bayer, BoehringerIngelheim have collaborated with medical device companies such as Aptar, Nypro and Gerresheimer, starting from Phase I development of drugs, for developing formulations for pre filled syringes and inhalers. Such a collaborative approach calls for reducing the time to market these products in India, since the medical device companies are involved in design and manufacturing of medical device components right from Phase I development of drugs.

	Global Scenario	Indian Scenario
Innovative R&D	 Low High	 Low High
Technology Partnership	 Low High	 Low High
Open Innovation	 Low High	 Low High
Crowd Sourcing	 Low High	 Low High

Indian pharma landscape – A comparative analysis:

While global pharma MNCs are well advanced in terms of innovative R&D, technology partnerships, open innovation and crowd sourcing, domestic Indian players are yet to follow the race. However, this type of technological innovation is yet to take shape in India, as Indian companies are not investing in R&D due to lack of adequate required capital. There are no companies in India who have already come up or are planning to install full-fledged virtual R&D centres for the lack of technology and other funding requirements in India. Globally, the alliances indicate the highly innovative ventures taken recently by major pharma companies. The reactive nature of Indian pharma industry might act as a barrier to run in the global race where innovation tends to be the major factor to differentiate one pharma major from the other.



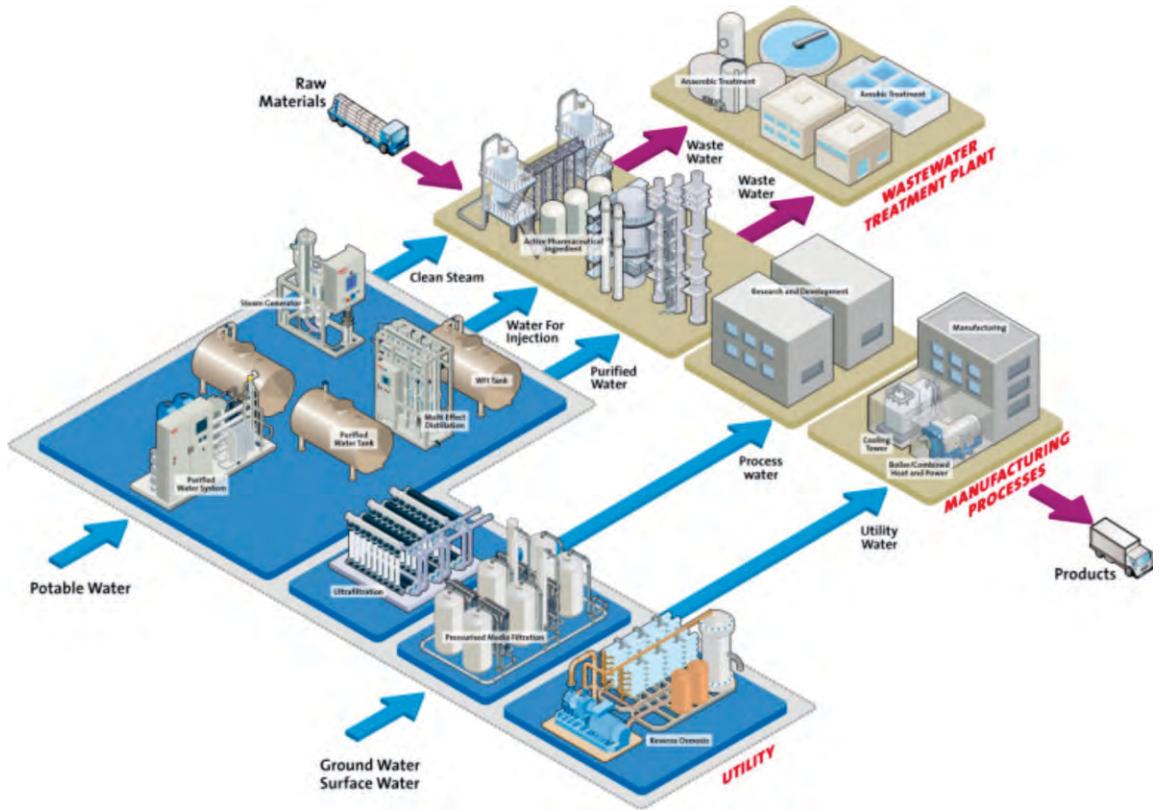
Logistics and distribution network:

Pharma wholesaler or distributor sector is fragmented. The first point of contact after the manufacturer is the carry forward agent. In each State there will be one or two carry forward agents who pay the deposit fee and carry pharma inventory. Since India has a double taxation system for every state – central sales tax and state sales tax, possessing CFA in every state will avoid multiple tax payments for the same goods.

Integrating CROs with pharma companies:

CROs form an integral part of the pharma supply chain and they assist major pharma companies in cost effective drug development process. For example in India, CROs assist pharma companies in:

- Providing staff:** (Clinical Research Associate or CRAs) for monitoring clinical trials.
- Regulatory work:** CRO help pharma companies expedite regulatory work (Clinical trial material import etc).
- Data management:** Though data management services are majorly provided by BPOs (TCS, Accenture, Cognizant), some leading CROs in India (SiroClinpharm, Quintile) do provide these services as well.



Need to revamp Indian pharma supply chain:

Primary reasons to revamp a pharma supply chain in India can be outlined as a shifting global trend towards in-life licensing, continuous manufacturing and value based pricing. There is a huge potential left in terms of ‘innovation’ in which the aforementioned three parameters play a vital role.

Indian pharma companies are yet to bring innovative R&D and patient management and assistance programmes integrated into the supply chain and are dependent on the high volume segment – generic drugs. Indian pharma industry is currently in a nascent stage in terms of technological innovation and new advancements such as open innovation, crowd sourcing etc. The socio-economic conditions in India are driving the patient segment towards low cost drugs. Hence, generics segment in India is growing at a faster rate when compared to patented drugs. Though, global pharma companies are innovating in terms of technology, open innovation, crowd sourcing, in-licensing etc., Indian pharma companies are yet to follow the global race.

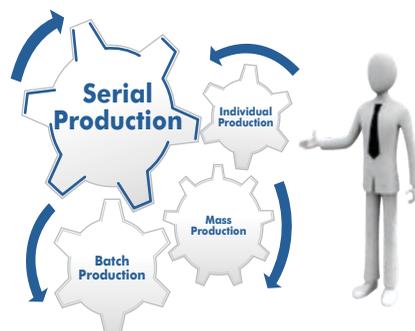
However, Indian pharma segment has an intensive patient pool with varying genotypes when compared to developed regions. Global pharma MNCs can leverage the patient pool for conducting their clinical trials in India. This will provide opportunities for increased partnerships (which leads to increased R&D trials) of global pharma MNCs with domestic CROs. A shift in industry trend from high volume to high value can be expected if pharma MNCs focus to drive to increase their R&D spend. This will increase vertical integration in terms of increased partnerships from raw material manufacturers (APIs, excipients and other chemicals – back ward integration) to pharma distribution companies (forward integration) in the overall pharma supply chain.



The Guide:
 Pharma Logistics impact human life, so most sensitive in terms of its reach especially considering the high ambient temperature and fluctuations in climate across India.

3.3 serial production

A typical example of serial production is the manufacture of various models of the same car brand. In serial production, the same production facilities are used to make individual series. These lines have to be retooled, a procedure that usually results in special costs. As a result, planning of the lot sizes is of particular importance. The logistics systems must be more flexible for this type of production than for mass and batch production



8. the peculiar challenges of chemical supply chain logistics in india

About The Author: Mr. Ranbeer Chaterjee, Head Logistics, Linde India Ltd. Mr. Ranbeer Chaterjee is heading Logistics department at Linde India formerly known as BOC India Ltd. & managing critical logistics functions under stringent –HSE Standard.

The global chemical industry is witnessing several changes in the form of new trends and challenges, such as:

- **Globalization:** Expansion into emerging geographies; restructuring and consolidation are leading to increased pressure on margins, growth, change management, costs and portfolio rationalization.
- **Fluctuating raw material prices and global supply chain:** resulting in high chemical inventory (raw materials and finished goods), ineffective procurement and disintegrated supply chains.
- **Strict industry regulations:** Continued focus on international reporting standards and increasing need for standardization of Environmental Health and Safety (EH&S) in emerging markets while producing at a lower total cost of operations and optimized utilization of assets from new Asian players and entry into growing markets such as China and India.

These challenges require chemical companies to constantly innovate, increase responsiveness and agility, and grow profitably. Overall, they constantly face challenges in managing a global organization while producing at a lower total cost of operations and optimized utilization of assets.

We hear continually that the world has become a global village, with barriers falling because of global movement of goods and labor. In today's global economy, a computer chip may be designed in America, fabricated in Europe, and finally assembled and packaged in Asia, to be sold again in America. The Indian consumer today has access to fruit grown in Australia and China, which was unheard of even two decades ago. Even within individual countries there is far more extensive movement of goods and labor than before.

The modern chemical industry also has a global "supply chain," which brings along a new set of challenges, particularly in India. For example, every day, a chemical company operating here has to deal with volatile fuel prices, increasing raw material costs, and mounting price pressure, and ensuring that materials are delivered to the factory for production and then products are sent to the customers on time. We thought we would share with you how we have approached this issue.

Ensuring with prompt and economical delivery of products is a challenge in India. Unlike European or other Asian countries, we have limited number of cost-effective and quick alternatives. Coastal waterway systems are

still in a primitive stage. The wide Indian rail network is still unable to provide effective service to industry. Consequently, a manufacturer like Linde India Ltd is still dependent on surface transportation. The government's initiative to invest in the development of arterial roads connecting major parts of the country has resulted in strengthening of the road network every passing year, and so things are improving, although they are still far from optimal.

At Linde India Ltd, we want to become the preferred choice for Indian specialty chemicals customers, and we have been continuously exploring new supply chain models. Linde India Ltd's target is to service customer needs as fast as possible, often within 24 hours. For this, we have set up satellite warehouses closer to our customer base. These warehouses provide service to all business units on a cost-sharing basis, and are operated by a third-party logistics provider. This model offers synergy of operations and cost advantages for Linde India Ltd.

Another challenge we face is ensuring proper safety measures are implemented during handling and distribution of chemical products. To deal with this issue, Linde India Ltd employs a team of well-trained professionals who can quickly respond to any problems during the product handling and distribution phase. Yet another challenge is getting fast import and export clearances for materials.

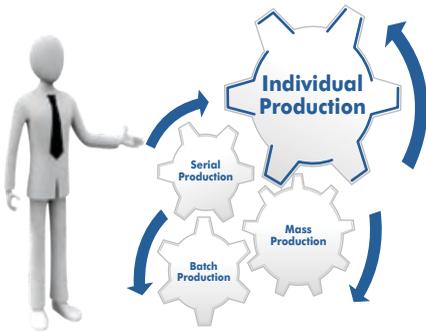
Our view is that logistics plays a very important role in business sustainability and growth. Efficient and cost-effective logistics processes support Linde India Ltd to maintain its cost-competitiveness, customer loyalty and also protect its margin targets. We are proud of our supply chain model, which has been developed on the pillars of quality, safety and efficiency, and is resulting in industry-leading operational excellence.

The Guide:

The future in India is "RESPONSE CARE". All logistics service providers and Chemical Companies will have to strive very hard to achieve the stiff standards in a difficult and mostly unorganized market.



3.4 individual production



Airplanes, ships, large machines and installations are manufactured individually. In individual production, flexibility of the production logistics reaches the highest level because the manufacturing job nearly always involves an individual customer request. The production logistics system must therefore be able to provide the production units with constantly changing feedstock in terms of type and amount.

9. the logistics of liquid bulk (wine)

-By Editorial

This is to share how the logistics of an ubiquitous but “a desirable” product across the globe can impact costs and how the word “bulk” makes the product delectable and more importantly “may be” attractive in price (or more margins for the brand!!) instead of the conventional wisdom, read ahead-----

For starters, liquid bulk transport saves money. Rabobank estimated that bulk shipping yielded an annual savings of \$142,300,000 in 2010 when compared with 2001 bulk shipments. That’s a savings of \$2.25 for a standard 9-liter case of wine.

Ocean transport charges are typically based on volume, therefore it’s in a shipper’s best interest to use the maximum amount of space



available. One-third of an ocean container’s space is “lost” when filled with bottled wine. While a 20-foot container accommodates about 9,000 liters of bottled wine, a bladder holds 24,000 liters and costs only a little more to transport. The mass also helps keep wine cooler during the voyage and reduces the need for refrigeration, which can contribute to the overall savings by up to \$5,000.

An equally big advantage to shipping liquid bulk is the environmental benefit. There is a large carbon footprint when it comes to shipping in general. In fact, “The carbon footprint of alcohol consumed in the UK is 1.5 percent of the total UK greenhouse gas emissions, which one-quarter is attributable to wine,” reports The Horse’s Mouth. The development and use of the flexitank is one way to reduce carbon emissions from wine shipments.

Shipping liquids by bulk does have a drawback, however, the largest being job loss. Because the wine is no



longer bottled before shipment, factory workers previously employed at bottling plants or glass factories are losing their jobs. South Africa is a prime example of job loss due to increasing liquid bulk transport.

The wine industry in South Africa played a major economic role in building the post-apartheid nation. The weather, land and resources make the country perfect for growing and bottling wine. In 1994, there were 275,000 people employed either directly or indirectly in the wine industry. By 2000, those numbers had fallen to 160,000.

In January 2011, “bulk [wine] exports overtook bottled shipments in South Africa for the first time.” This was a major turning point for the industry, and triggered many layoffs. The only way we can create more jobs is if we could bottle wine locally. The South African

government was so incensed they threatened retaliation against the UK, the largest importers of wine, saying they would import bulk whiskey from Great Britain and bottle it in South Africa.

Wine contained in every four out of five bottles in the UK’s stores has been shipped in bulk. In the U.S., it’s two out of every five bottles. Furthermore, many brands have begun using liquid bulk transport as a way to remain competitive. Bulk wine imports are on the rise and the future forecast is for more of the same. Shipping in liquid bulk for the producer is one of the most compelling ways to stay competitive in the market place. Job loss is an unfortunate consequence that will have to be acknowledged and managed before it is too late. Yet, liquid bulk shipments will continue to reshape transportation and logistics by cutting costs, maximizing cargo space and providing a more ecologically sound way to transport liquids



The Guide:

The future will be movement in “BULK” rather than in small packs and lots. This will eliminate wastage, contamination and also reduce freight cost per liter.





**MAKING LOGISTICS
SMARTER**



TCI Rail, a dedicated vertical of TCI, offers its customers end to end multimodal Rail-Road Logistics solutions for their various needs in a safe, speedy and cost effective manner. With rich knowledge and expertise in dealing with Indian Railways. TCI Rail is dedicated to providing world class freight solutions to its esteemed clients.

Services

- Container Rake Service
- Indian Railway Rakes Services
- ICD/Warehouse Management
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- Pan India Network
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4

CASE study



CASE study : A TRUE CASE OF RESOURCE PARTNERSHIP

Re engineering the Supply chain:

The Case Study on India's leading Automobile Manufacturer and how TCISCS has been able to deliver to their expectations.

about client



The Client is amongst the top 10 business houses in India. Its footprint stretches over a wide range of industries, spanning automobiles (two/three-wheelers), finance, home appliances, lighting, iron & steel and travel. The group's flagship company, is ranked as the world's fourth largest two-and three- wheeler manufacturer and the brand is well-known in over a dozen countries in Europe, Latin America, the USA and Asia- and easily the best known brand in 2 Wheelers in India.

the challenge

The client leadership could foresee the changes in customer behavior unfolding in the market place and the key role which distribution will play. Their focus on Supply Chain Management triggered the need to re-engineer their Supply Chain to make it leaner and more responsive to change.

This was easier said than done, as it involved a close coordination and transparency- from the dealer to transporter to distribution to production planning and finally to the parts vendor.

the approach

A Cross Functional Team was formed at client side for developing a fresh perspective to the challenge. This team zeroed into TCI and a road map was prepared.

The first phase was identified as distribution as client had the customer as its first priority and another factor was that outbound logistics was a bigger challenge. The fundamental of this approach was forging of a true partnership between client and TCI as the chosen 3PL.

The engagement was right from when the plant was being set-up, so that the construction of Inbound Stores and FG Yard is planned appropriately with all due consideration.

PHASE 1

The distribution system was studied, discussed and debated across various meetings and the plan was woven around the vision that Dealer must not hold excessive inventory and he must “order as he retails”.

This involved a change from the existing order pattern of full load (say 55 Bikes) to any number ; which further peculated into making the delivery in “dealer clusters” than single dealer and further required vehicles with modular fittings as the client product line had everything from an 80 CC Step through to an Eliminator (now Avenger) high-end motorbike.

A zone was chosen as the Pilot Area and dealers were met across for encouraging transparency, changing the order pattern from push to pull and a lot of commitment (to the dealer) of supply of desired quantity in 48 hours of order.

Vehicles were designed to be modular, confirm to CMVR guidelines, be 100% covered and also have GPS on them for better fleet management.

For the first time in the industry, trailers were designed for Bikes and further the trailer was made into a 3 Deck Trailer, the first time in India thatsuchan invention was done for road transport.

This product (patent applied by TCI) carries 105 to 110 bikes in one go or can accommodate 28 Auto Rickshaws (against 14 in a normal truck) to reduce the complexity and save cost on transportation.

This vehicle has been further developed to have a tailgate – a self loading (or unloading) mechanism for easy discharge of cargo without a ramp.

The dealers now carry 12 to 15 days of inventory (against 35 earlier). Nothing like a win-win for sustainable development.

PHASE 2

The next item on the agenda also focused on the customer. It was the arena of after sales - the availability of genuine client automobile spares. The objective was dual - to ensue timely delivery of spares to a dealer for his customer as well as check the growth of spurious spares, which were available in abundance for a well known brand.

This led to formation of a Logistics protocol. The regular orders were shipped through the conventional mode of TCI , by a Hub and Spoke arrangement while the VOR (vehicle off road) were shipped through XPS surface cargo and XPS Air (Emergency orders).

This focus on spares was further enhanced by a Pilot Depot in a Zone for Spares. Here the results have been startling - within three months the dealer spares inventory has fallen to 15 days and deliveries happened the same day in the core zone (65%) and within 24 hours in remainder of the zone.

The parts like a motorbike chassis, which is required rarely, is also available in a day leading to very quick repairs to even the worst mishaps and thus validating the customer's faith in purchasing a client product.

PHASE 3

The growth plans of client saw it moving to Pantnagar in Uttranchal for a Greenfield project. In this modern plant, it decided to give half of its land to its vendors to help them in relocating their facility nearby. This was a first by any auto major and set the stage for a JIT (Just in Time) production system for Bajaj.

TCI was entrusted with the entire logistics of supplier coordination and delivery to the plant. Further the receipt in plant and delivery to the line was also entrusted to TCI. The type of vehicles deployed was customized to Trolley/ Bin sized and included LCV's and also some Commercial Tractor Trolleys.

During start up all suppliers could not relocate or ready their facilities hence a separate VMI (Vendor Management Inventory) facility was created to facilitate collection, provide value added services like kitting and binning and supply to the plant on the schedule.

Some critical components made at Waluj arrive in returnable bins in 48 hours by a fleet of dedicated containers, completing the loop for making world class motorbikes in the foothills of the Himalayas.

SUPPLY CHAIN



The client was keen on having its vendor based close by and at present approximately 80-85 % of total component need is met by the vendor located in the near by cluster, the Remaining part comes from Client plant or other supplier located elsewhere in the country.

The client wanted the factory to be free of inventory and the production lines for both engine and body to run on JIT (Just in Time) Format. TCI Supply Chain Solution was recruited for the purpose and the discussion began even before the plant was laid.

Today Client is able to churn out a huge number of motorcycles each day utilizing the least possible workforce as well as running an extremely efficient production line.

TCI Supply Chain started with the design of the loading and unloading docks at both the plant as well as the cross dock warehouse located nearby. The docks are of same height (1 metre) as the door of the most truck. Therefore, not too much time and effort is needed to load and unload cargo.

Special Ramps have been designed to handle trucks that are too high.

The work order is sent out for the day by Client informing supplier on the number of parts required in each "milk run". TCI is kept in a loop since it has to send out special trucks to various suppliers on "milk run".



A set amount of time is allocated to each vendor to have the stock ready, before it is loaded in the truck. After completing its round, the truck brings stock to the cross dock warehouse, where the parts are categorized, washed and then placed in special molded bins.

The cross dock warehouse requires material to be supplied every two hours from the vendors.

In addition to these local parts, the material from the Waluj (plant at Maharashtra) plant also finds its way to cross dock and consequently onto the molded bins.

The trucks that bring the material from Waluj are also TCI vehicles that are fitted with GPRS devices so that client can know their whereabouts at any given moment.

TCI also benefits from GPRS monitoring and thus can plan its fleet for future deliveries. TCI is the first company in India to introduce GPRS as a truck tracking method in the field of logistics.

The molded bins are of 2 types: - one for engine part and other for the body. Each Part has a mould that corresponds to the part design. Once placed in the mould the bins are stacked and ready for **delivery on line** (this is the third supply that runs directly from vendor to plant, it comprises of the chassis and electrical).

Client has stipulated a time of 1 hour for each delivery from the cross dock warehouse. For this purpose TCI has specially design trucks that have rails fitted inside them to make loading and unloading of the mould bins as easy task.

The bins are loaded at the warehouse and carted across to the plant where they are delivered directly onto the 2 production lines. Also part of the delivery service is a unique tractor trailer that runs between the warehouse and the plant. Two trailers and one tractor have been employed for the purpose.

First the tractor delivers the full container to the plant and from plant it takes the previously left empty container back to the warehouse to be filled. This process works in a flowing manner and utilizes the least amount of man power as well as vehicles.

TCI supply Chain solutions also provides client with all the man power as well as at the loading and unloading docks, these personnel is duly trained by TCI.

Once the material has reached the production line, the process of inbound logistics is complete.

Now comes the part of Outbound Logistics: TCI Supply Chain Solution Handles approximately 90% of the outbound logistics at the client facility.

Due to the smooth flow of components to the plant, client is able to roll out a bike every 28 seconds.

Once off the production line, a TCI hired employee takes the bike to the storage area from where it will finally be loaded onto specially designed container trucks for transport to all corners of the country..

The out bound truck are mainly double Decker models but there are also patent TCI designed triple Decker models that do duty on this route. These trucks are built specifically to cater to automobile clients and there are large lifts that allow for quick and easy loading of the vehicles with minimum damage.

Each truck also comes with a unique compartment that allows for the storage of spare parts which also have to reach the dealers. Through this unique design, client is able to transport its spare parts at no extra cost as the truck is already carrying bikes and are fitted with the GPRS devices.

Client is already thinking of scaling up its production cycle and this means that TCI supply chain solution will have to also increase its cycle correspondingly. Not easy, but then if your customer is amongst the foremost names in the auto industry, it is inevitable to go to the extra mile.



operations

INBOUND LOGISTICS OPERATION:

- Warehousing
- Kit -binning
- Wheel Assembly
- Material Pulling, based on JIT Concept
- Production Line Feeding
- MIS/KPI Preparation

OUTBOUND LOGISTICS OPERATION:

- Storage of Bikes as per dispatch plan
- Loading and Invoice generation for Bike Dispatch
- Follow-up for timely delivery, and collection of Customers feedback

SPARE PARTS DIVISION:

- Receipt of Materials and Delivery Plan
- Unitization & packing, and price-tagging of materials
- Dispatch of materials, and collection of customer feedback

inbound logistics operation

1) WAREHOUSING:

- Materials are maintained, model-wise, in their location.
- FIFO is maintained through Visual Control Technique.
- Materials come from 10+ Cluster Suppliers and 15+ Non-Cluster Suppliers.



2) KITBINNING:

- Materials are kept on flow racks and are kept in kitbin, for a unit bike.
- Kitbin for different models are different in design, differentiated by colors and models.
- Kitbin preparation is totally controlled by Visual Control Techniques, and are monitored throughout the shift.



3) WHEEL ASSEMBLY:

- Receipt of Alloy-Wheel and Tyre/tube
- Assembly of Wheel (front/rear) on different line.
- Pre-dispatch Testing
- Dispatch of wheels



4) MATERIAL PULLING BASED ON JIT:

- Materials are brought to Warehouse by Milkrun Vehicles.
- Material pulling is based on Production Plan.
- Suppliers are informed through Material Schedule, and adherence is monitored by TCI Route Controller.
- Materials for cluster suppliers are kept for 1 to 2 hours.



5) PRODUCTION LINE FEEDING

- Line Feeding is carrying components, model-wise, as per production plan.
- Line-feeding is done every half an hour.

6) MIS/KPI PREPARATION

• MIS includes:

- i. Type and Quantity of materials, pulled per trip
- ii. No. of trips, vehicle wise
- iii. No. of Labors deployed per activity
- iv. Abnormality Report in operation

• KPI includes:

- v. Kitbin Preparation and Loss report
- vi. No. of dispatches against no. of bike production per day
- vii. Abnormality Report in operation



outbound logistics operation

- Finished bikes are stored as per their dispatch plan.
- Invoice generation is the responsibility of TCI on behalf of client
- Follow-up from drivers is the responsibility of TCI.
- TCI collects feedback from different dealers, related to delivery condition and product quality.



spare part delivery

- Receipt of materials
- Unitization & packing and price tagging
- Dispatch and customer feedback

in conclusion

The partnership is now over 7 years old and TCI has been able to deliver much beyond the regular KPIs; in terms of indirect and unquantifiable benefits. This case stands out not only in the Automobile and Logistics space but also overall exemplifies "the true spirit of Outsourcing and Partnership viz. RESOURCE PARTNERSHIP"

The challenges ahead are greater and the team is now ready to sustain - and build upon - the learning's acquired together.

glossary

- 1. Bottlenecks :** A bottleneck is a phenomenon where the performance or capacity of an entire system is limited by a single or limited number of components or resources
- 2. Consignee :** The party to whom goods are shipped and delivered. The receiver of a freight shipment
- 3. Cross Docking:** A distribution system in which merchandise received at the warehouse or distribution center is not put away, but instead is readied for shipment to retail stores. Cross docking requires close synchronization of all inbound and outbound shipment movements. By eliminating the put-away, storage and selection operations, it can significantly reduce distribution costs.
- 4. CROs :** Contract Research Organization
- 5. Distribution Centers (DCs) :** The warehouse facility which holds inventory from manufacturing pending distribution to the appropriate stores.
- 6. Departmentalization :** It refers to the process of grouping activities into departments.
- 7. EPA :** Environmental Protection Agency
- 8. EH&S :** Environmental Health and Safety
- 9. Express (XPS):** 1) Carrier payment to its customers when ships, rail cars, or trailers are unloaded or loaded in less than the time allowed by contract and returned to the carrier for use. See: demurrage, detention.
2) The use of priority package delivery to achieve overnight or second-day delivery.
- 10. Freight :** Goods being transported from one place to another.
- 11. FMCG :** Fast-Moving Consumer Goods
- 12. Greenhouse :** It is a building in which plants are grown.
- 13. Global Positioning System (GPS):** A system which uses satellites to precisely locate an object on earth. Used by trucking companies to locate over-the-road equipment
- 14. GCMMF:** Gujarat Cooperative Milk Marketing Federation
- 15. Hubs:** 1. A large retailer or manufacturer having many trading partners.
2. A common connection point for devices in a network
- 16. Inventory:** The raw materials, work-in-process goods and completely finished goods that are considered to be the portion of a business's assets that are ready or will be ready for sale.
- 17. Inbound Logistics:** The management of materials from suppliers and vendors into production processes or storage facilities.
- 18. Just In Time (JIT) :** An inventory control system that controls material flow into assembly and manufacturing plants by coordinating demand and supply to the point where desired materials arrive just in time for use.
- 19.MNCs :** Multinational Corporation
- 20.Operational :** It is a result of the process of operationalization and is used to define something (e.g. a variable, term, or object) in terms of a process (or set of validation tests) needed to determine its existence, duration, and quantity
- 21. Outbound Logistics :** The process related to the movement and storage of products from the end of the production line to the end user.
- 22. Resources :** Economic elements applied or used in the performance of activities or to directly support cost objects. They include people, materials, supplies, equipment, technologies and facilities.
- 23. R&D :** Research and development
- 24. Return on Investment (ROI):** It is the concept of an investment of some resource yielding a benefit to the investor
- 25. Supply Chain Management :** Supply chain management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management

activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers

26. SKUs (stock-keeping units): A category of unit with unique combination of form, fit, and function (i.e. unique components held in stock)

27. Shipments : The action of shipping goods.

28. SSL : Solid-State Lighting

29. Traceability : 1) The attribute allowing the ongoing location of a shipment to be determined.
2) The registering and tracking of parts, processes, and materials used in production, by lot or serial number.

30. Third-Party Logistics (3PL): Outsourcing all or much of a company's logistics operations to a specialized company.

31. TCO: Total Cost of Ownership

32. Ventures: A business enterprise or speculation in which something is risked in the hope of profit

33. Vendors : The manufacturer or distributor of an item or product line

34. Vendor-Managed Inventory (VMI): The practice of retailers making suppliers responsible for determining order size and timing usually based on receipt of retail POS and inventory data.

35. VOR: Vehicle off Road

36. WIP (Work-in-Process) : Parts and subassemblies in the process of becoming completed finished goods.

37. Warehouses: Storage place for products. Principal warehouse activities include receipt of product, storage, shipment, and order picking.

disclaimer

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- Inbound / Production Logistics
- Outbound Logistics (OBL)
- Handset Distribution
- Distribution Centre Management
- Reverse Logistics
- Equipment Logistics - Supplier to Site
- Multi-modal Movement

AUTO



- Inbound / Production Logistics (IBL)
- Outbound Logistics (OBL)
- Spares / After Market Logistics
- Multi-Modal Logistics
- OEM Solutions-Kitting & Line Feeding
- Reverse Logistics
- Yards and Distribution Centre
- Last Mile Distribution

HOW WE CAN HELP YOU ?

The core value offered by TCI SCS is in managing and integrating the flow of information amongst hundreds of outsourced supply chain partners and the enterprises that employ them.

RETAIL & CP



- Inbound / Vendor Logistics (IBL)
- Multi-Modal Logistics
- Distribution Centre Management :
 - Modern Retail
 - Tradition Distribution / Retail
 - Institutions (CSD)
 - Premium Packaging and Kitting

HEALTH CARE & LIFE SCIENCES



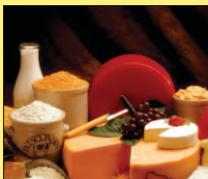
- Distribution Centre Management
- Express Movement
- Cold Chain
- Reverse Logistics

CHEMICAL



- Warehousing
- Packaging & Value Added Services
- Bulk Tankers
- Hazmat Logistics

COLD CHAIN



TCI temperature-controlled logistics provide transport solutions using state-of-the-art information systems to rapidly retrieve and move products and information across the cold chain. This is particularly crucial to cold storage and distribution supplies.

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- Focus on corporate Core Competence
- Cost Reduction
- Enhance Asset Productivity
- Improve Operational Efficiency and Productivity
- Improve Customer Service
- Cycle Time Reduction
- Incremental Profitability

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