

3PL Services in India: Challenges, Opportunities and Recommendations - A Study at IIFT

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Methodology

- 1) To collect Primary Data from 3PL providers and from Companies outsourcing 3PL services to providers. In order to make it convenient for involved parties, create a Questionnaire so as to get perfect answers, rather than getting open ended views.
- 2) To collect Secondary Data from EXIM Journals, EXIM Dailies, Internet Articles and Books written on the subject.

Introduction:

Typically, a core company providing services or products is considered the first party; the customer, the second party. A third-party, then, is a firm hired to do that which neither the first or second party desires to do. A third-party logistics firm is a firm that provides outsourced or “third party” logistics services to companies for some portion or all of their supply chain management functions. 3PL typically specializes in custom clearance, Freight Forwarding, Warehousing, transportation services that can be customized to customer needs and demand.

The 3PL industry evolved in the 1970's when during a time of expanding globalization and an increased use of information technology (*Song & Regan, Industries in Transition: Freight Transport Intermediaries in the Information Age, 2001*). The first generation 3PL's (1970's-1980's) offered services such as transportation, brokerage, and shipping. Second-generation 3PL's (1980-1990) were mostly asset or non-asset based companies with increased service offerings. The third-generation-3PL's (2000 onwards) were mostly web-based 3PL's with increased supply chain integration (*Nemoto & Koichiro, Advantage of 3PL in SCM, 2007*).

Third-party logistics (3PL) is gaining importance as more and more organisations across the world are outsourcing logistics activities to the 3PL service providers. By outsourcing logistics activities, organisations are able to not only concentrate on their core business operations, but also achieve cost-efficiency and improve delivery performance and customer satisfaction.

The 3PL market in India was under-developed and highly fragmented. However, recent trends show that the Indian market has come of age with small family-run businesses giving way/progressing to professional-run corporate enterprises. This refreshing change is indeed a welcome sign for the growth, as professionalism can go a long way in building efficiencies and reducing costs.

Discussion Point 1: Definition of 3PL and its Evolution

The principle reasons for firms using 3PL services can be attributed as under:

- Globalization of sourcing, manufacturing and distribution leading to an increase in the complexity of material movement.
- Competition that has forced companies towards more responsiveness and a reduction in inventories. There is an increased need for small but frequent shipments with 100 percent reliability, requiring core competence in logistics management.
- Resource constraints that require companies to concentrate only on their core manufacturing or new product development activities.

In the 3PL industry, some service providers have high standardized service offerings. This enables the provider to benefit from increased economies of scale, risk sharing, and volatility smoothing. However, providing standardized services in a cheaper way is no longer sufficient for 3PL firms. Second, with the constant shift in client business, more customized and value-added services are required.

Therefore, it is argued that 3PL firms need to provide more than standardized services. Innovation and new service development are vital for 3PL firms. Because different clients have different needs, differentiating logistics services is essential for a 3PL provider's business (*Veeken and Rutten, Logistics Service Management: Opportunities for Differentiation 1998*).

Discussion Point 2: Elaboration of the reasons for choosing 3PL. What is meant by value added services?

Literature Review

3PL involves the use of external companies to perform logistics functions, which have traditionally been performed within an organization. The functions performed by third party logistics service providers can encompass the entire logistics process or select activities within that process. Due to globalization, firms are involved in designing and delivering products worldwide. Firms source components globally. This had initiated the need for a specialized logistics division, within the organization, that tries to keep a link of the supply chain. However, understanding the different structure of customs, taxes, transport needs of many countries, though not impossible, is not feasible for firms. This is the reason for outsourcing the logistics function to 3PL providers. Further to this, companies like Dell or Future Group have created success stories based on the **lean supply chains**. This has further initiated the need for a specialist to design and control various aspects of the supply chain. These facts have been pointed out by researches undertaken by many like Sahay and Mohan (2003).

Craig Grossgart states that Indian Companies are relying on 3PL's to boost Manufacturing efficiency. The market is still at a nascent stage but growing at a healthy 18% a year (*The Journal of Commerce, India Primed for 3PL boom, March 5, 2007*) There have been a lot of surveys on the quantum of the Indian Logistics industry, with *Datamonitor* predicting in its report, "*India Logistics Outlook 2007*" that the industry was a USD 125 Billion Goldmine all set to grow.

In 2006, *Frost and Sullivan* had undertaken a research on the Indian Logistics Industry. Researcher, Ramesh Mohan, had indicated that with the opening up of the economy, foreign entrants may not find it feasible to invest in logistics infrastructure immediately and there is a huge potential for 3PL to tap.

Vivek Kelkar in an article in *Chemical Engineering World, May 2008*, states that India spends more than 13% of its GDP on logistics, which is very high compared to western European and North American countries where the spend is around 8-10%.

It is found out that literature from the perspectives of logistics users is abundant but from the perspectives of 3PL provider is difficult to find. There are many articles and research studies done, to determine why companies outsource their 3 PL activities and how to measure the efficiency of outsourcing 3PL services.(*Feare,2000*) and (*Thakkar et al.,2005, Supply Chain Forum*).

***Discussion Point 3: What are the salient findings from the literature?
What is lean supply chain?***

The Concept of a Third-Party Logistics Firm

Terms such as third-party logistics, logistics outsourcing, and contract logistics have been introduced in recent years, but the use of these terms is not consistent. According to *Lieb (The Use of Third-Party Logistics Services by Large American Manufacturers, 1992)*, a 3PL firm is an external company to perform logistics functions that have been traditionally been performed within an organization.

Evangelista and Sweeney (Technology Usage in the Supply Chain: The Case of Small 3PLs, 2006) defines a 3PL firm as a logistics service provider carrying out service offerings on behalf of a shipper where the service offerings consist of at least transportation.

These definitions tend to emphasize the fact that a 3PL firm is an external company carrying out logistics activities on behalf of the shipper. However, 3PL firms do not merely replace shippers to provide logistics solutions that are traditionally done in-house. They are customer oriented and need to adapt and generate solutions for their client. In addition, these definitions do not consider the fact that 3PL firms can play different roles in supply chains.

3PL firms can provide value-added services. 3PL firms can also contribute to supply chain integration and performance. In addition, 3PL firms can have a critical role in linking users to their major vendors and customers, thereby facilitating supply chain integration (*Lieb and Bentz, The Use of Third-Party Logistics Services by Large American Manufacturers: The 2003 Survey 2004*).

Discussion Point 4: Discuss the functions of 3PL.

What services are provided globally (reference to additional literature)?

An Overview of the Logistics Sector in India

ASSOCHAM claims that the outsourcing of 3rd Party Logistics business (3PL) in India is set to become \$ 90 billion size by 2012. The concept which was introduced in US and Europe, is fast catching up the pace to increase the efficiency of domestic corporates through efficient logistic functions. ASSOCHAM projected that Indian logistics industry is expected to touch \$125 billion by 2010 end from \$105 billion, an increase of around 16-17 per cent in the next two years.

The 3PL industry is expected to become a \$90 billion industry from the current \$58 billion, as around 55 per cent of Indian companies are outsourcing logistic services like supply chain management and warehousing, which used to be between 10-15 per cent, ten years ago. “One of the contributing factors for this is Value Added Tax (VAT) which is expected to drive Indian industry towards using more 3PL services” [1]

The Indian Logistics Market generates annual revenue of USD 50 to 90 Billion, but the share of 3PL providers in this huge market, is very small. This is very much in contrast to the US Industry, which is estimated at USD 105 Billion [2]

Value added services are currently the most important driving factor which hopes to increase in future. With the expansion of globalisation, Indian firms are demanding new logistics capabilities and more complex solutions from their 3PL partner. Greater acceptance of demand driven logistics practices introduces complexities into the supply chain and generate the need for contract logistics providers to deliver more expertise services. More companies are turning towards 3PL to help them in successful management of supply chain processes. 3PL provides the ability to bring down conventional logistics costs and handle more complicated tasks. Therefore, customers continue to give their 3PL activity more responsibility and input into their business process. In addition, strong FDI inflows in the automotive, capital goods, electronics, retail goods, telecom, will lead to increased opportunities for 3 PL providers.

However the sad part of the Indian Industry is that, every year the country loses nearly \$65 billion on account of the inefficient supply-chain system. The sector is expected to touch \$879 billion by 2018, but if its supply-chain system's challenges are not addressed, its growth could get hampered[3]

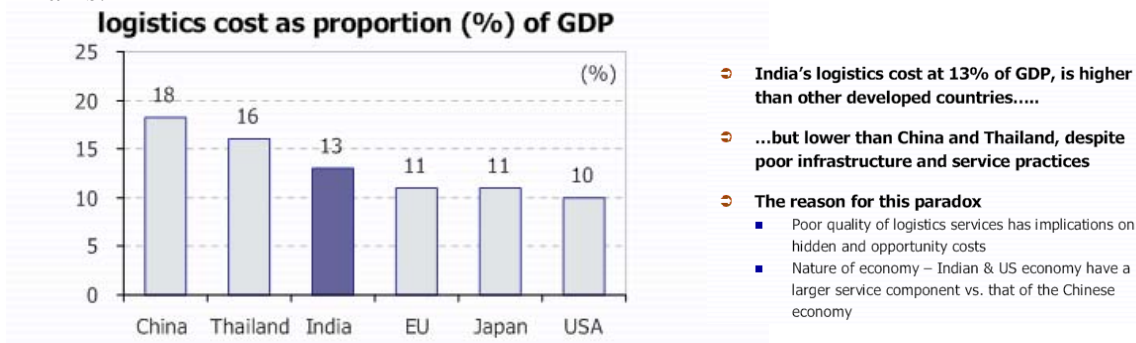
India's underdeveloped and Fragmented Trade and Transport Infrastructure, inflates logistics costs, which are more than 13% of India's GDP, compared to less than 10 % in North America and West Europe. India will have to work on such inefficiencies in order to attract and retain real long term investments.

Discussion point 5: Potential of 3PL in India

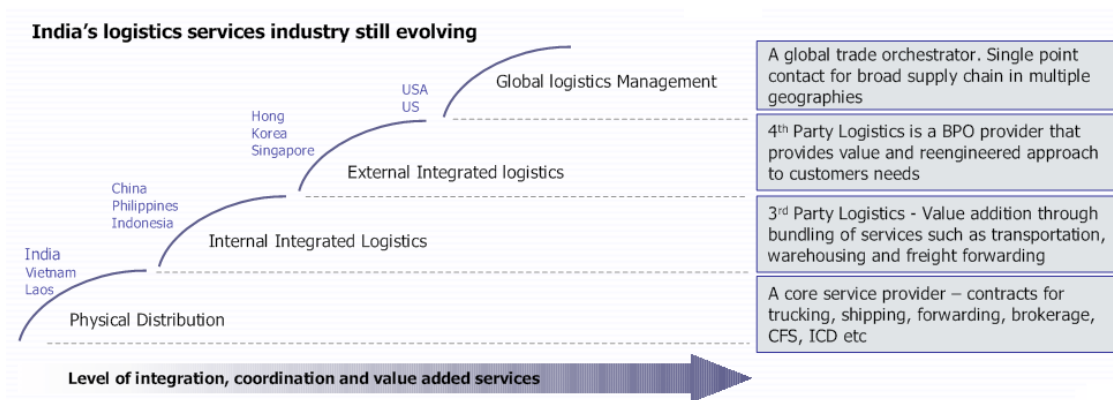
The Indian Transport Infrastructure

India's Logistics Industry is characterized by the dominance of disorganized operators. Transporters with a fleet of less than 5 trucks account for 2/3rd of the total trucks owned and operated in India. They generate revenue of around 80 %. Likewise; there are thousands of small Custom House Agents and Freight Forwarders, who cater to local requirements.

However, companies are seeking services beyond transportation and Custom clearance, which is why Trucking and courier companies are leveraging their networks to provide express distribution and warehousing, Freight Forwarders are moving towards owning assets in the form of Container Freight Stations, Inland Container Depots and Container Trains.



Source: Enam



Discussion point 6: Present Status of 3PL in India

Disaggregating India's Logistics Spend

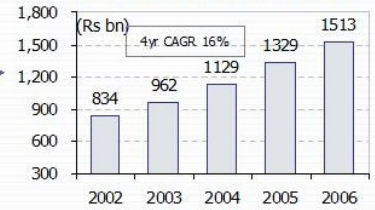
	(Rs bn)
Transportation cost	2,155
- Road Transport	1,513
- Railways	323
- Water Transport	117
- Air Transport	57
- Services incidental to transport	145
Inventory Carrying Cost *	1,850
<small>(i.e. capital cost of inventory, storage cost, Inventory service cost, risk cost)</small>	
logistics Administration Cost ^	160
<small>(i.e. management cost and IT)</small>	
India's logistics Cost	4,165
Proportion of GDP (%)	13%
Proportion of GDP (%) - excluding service sector	28%

Source: CSO 2006, ENAM Research Note: * Inventory carrying cost est. at 26% of inventory holding. ^ logistics admin. cost est. at 4% of transport & inventory cost

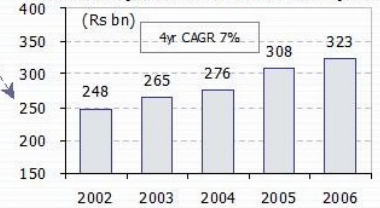


Source: CSO 2006 (current prices)

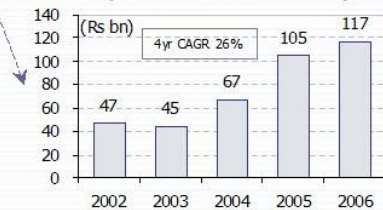
Domestic product from road transport



Domestic product from rail transport



Domestic product from water transport



Although it is well known that a well-developed logistics infrastructure can lead to significant savings in terms of service levels, inventory costs and processing time, India continues to spend relatively more on logistics due to inadequate infrastructure.

Logistics costs are estimated to be as high as 13-14 per cent of the GDP compared with seven-eight per cent in the developed countries. And at a GDP of over \$1 trillion, this represents a cost disadvantage of over \$50 billion in logistics in the country. Development of extensive road network along with hinterland connectivity, rapid implementation of the dedicated rail freight corridors, capacity expansion beyond the major ports sector and establishment of modern cargo handling facilities at airports are some of the challenges before the growth of the domestic logistics industry [4]

Discussion point 7: Analysis of logistics spending in India

Railways: Since 1950-51, route-km has increased by 18 per cent and track km by 41 per cent, even though freight output has burgeoned 12 times. Today, freight earnings account for over 66 per cent of the total earnings of the Indian Railways, with the freight rates being comparatively higher in India than many other countries[5]. The adjusted average freight revenue per tonne-km in India was about Rs 3.50 against about 90 paise in the US and less than Rs 2 in China and Japan[6].

Experts feel that rapid implementation of the dedicated freight corridor can significantly help in improving the logistics landscape in India. According to the Indian Railways, the lines that connect the four major cities of Delhi, Mumbai, Chennai and Kolkata known as the golden quadrilateral and the Delhi-Chennai and Mumbai-Kolkata routes, covering a total of more than 10,000 km, accounts for more than 55 per cent of its freight earnings. And, the existing trunk routes of Kolkata-Delhi and Mumbai-Delhi are highly saturated. It is in the light of this that the Government has proposed two dedicated freight corridors, which should be rapidly executed. However, the system of variable freight rates depending on class of commodities has discouraged some of the industries from using rail transport. At the same time, the total cost of using the rail network is high due to handling requirements and the time and cost of arranging pick-up and drop of consignment to and from railway facilities. This results in the slow average speed of freight movement and low average wagon turnaround time, which are major concerns for the logistics service providers in the country. The Indian Railways is making efforts to improve its services by introducing special freight trains, which offer much quicker transportation times, and offering multi-modal facilities to reduce handling times through containerized cargo movement by CONCOR (Container Corporation of India).

Air cargo: In regard to air cargo, Indian airports registered a healthy growth in air cargo in 2009-10, with the domestic cargo expected to increase at a rate of 10 per cent and international cargo 12 per cent year-on-year till 2011-12. According to Airport Authority of India estimates, the total air cargo traffic is expected to cross the 2.6-million mark by 2012 end [7]. The challenges in this segment include high airport charges. It has recommended uniformity in taxes on ATF fuel, usage of old airports and lowering of airport charges to give a boost to air cargo in India.

The six international and 87 domestic airports handle 0.22 million metric tonnes of domestic cargo and 0.468 million metric tonnes of international cargo which is extremely poor in terms of world standards. This is because the air cargo is used only when sea trade could not be used either due to time or space constraint. This poses a serious limitation in procurement, especially when companies are looking at adopting global sourcing strategies to reduce costs and enhance product quality. To make air cargo more attractive and efficient, the Indian government has initiated some major steps which include – introduction of ‘open sky’ policy, introduction of integrated cargo management system at four metro airports, provision of centers for perishable cargo and synchronization of working hours for city side operation for export and import activities.

Road freight: India has a fairly widespread road network totaling to 2.7 million kms of road length (1996-97), the third largest road network in the world. According to estimates

of the Planning Commission, the roads carried just 11 per cent of goods and 28 per cent of passengers during 1950-51. The proportions stood at 60 per cent for goods and 80 per cent for passengers during 1995. Express and National highways constitute only 1.4 per cent of the total road length but carry nearly 40 per cent of all freight moved through the road sector. Reach in the interiors of the mainland is limited with only 48% of the 0.55 million villages being connected with roads.

The road freight is expected to rise from about 3,000 million tonnes (mt) in 2009-10 to about 3,700 mt in 2012-13. However, despite the several roadblocks, India has amongst the most competitive and low-cost freight transport industry. Even trucking costs have come down significantly in the last few years. Unorganised trucking industry, high taxation, inadequate road infrastructure (which makes a truck cover only 250-400 km a day compared with 700-800 km a day in developed countries such as the US and Europe), limited investments are some of the challenges identified in this sector. Also, the pace of road building has to increase from the present two km a day to the target of 20 km a day. Therefore, analysts feel that it is imperative that the Government “fast-track” implementation of all key infrastructure projects, a majority of which are either delayed or suffering from cost over-runs — this can pave the way for better logistics management in the country.

Challenges in the Indian Logistics Sector

The infrastructural bottlenecks:

Infrastructure is one of the biggest challenges faced by the Indian logistics sector and has been a major deterrent to its growth. Infrastructural problems like bad road conditions, poor connectivity, inadequate air and sea port capacities and lack of development of modes of transports like railways and alternates like inland water transport and domestic aviation have been constant irritants. Due to the infrastructural bottlenecks costs per transaction in Indian logistics sector is very much high compared to those in the developed markets.

Transport of freight by road forms an important component of freight movements within India, with a large chunk of goods, over 65 percent, being moved by road. The poor infrastructure has severely crippled the smooth functioning of logistics operations. With narrow and congested highways, poor surface quality of roads and 40 percent of villages not having access to all-weather roads, the efficiency of the transport system is severely affected.

Pathetic road conditions combined with the fact that India is perhaps one of the least connected regions in the world constitute a major impediment. Poor connectivity via roads and railways to ports, warehouses and logistics hubs is major infrastructural bottleneck. Movement of goods within the country is fraught with delays and risks.

The bulk of Indian trade is carried by sea routes and the existing port infrastructure is insufficient to handle trade flows effectively. The current capacity at major ports is overstretched and their infrastructural upgrades are being made at very slowly pace. While Shanghai’s ports can turnaround a container ship in 8 hours, the same ship in

Mumbai takes 3 days. Air cargo handling facilities at mini metros and towns are negligible as to be non-existent.

The failure in augmenting the freight carrying capacity and efficiency of the railways has denied the logistics sector cheaper and efficient mode of transport. Comprehensive inland waterway systems, which India has in plenty and can act as auxiliary mode of transport, has been neglected. There is a huge requirement for air cargo centers due to growth in air cargo as well as upgradation of infrastructure at various airports.

The Indian government has started paying attention to the problems being faced by the logistics sector and has initiated several infrastructural projects to mitigate their woes. Projects like rail freight corridors and development of the inland waterways as a means of developing alternative modes of transport are being planned. Some important steps are being taken in augmenting the rural infrastructure like connecting majority of the habitations with all weather roads, construction of new roads and upgrading of existing ones etc. New port and a large container handling facilities are on the cards. But all these are still not sufficient to cater to the growing needs of the economy.

For cost effective movement of goods it is essential to have quality infrastructure in place. The challenge is to meld the different modes of transport together into seamless network such that the cost is at the lowest. The development of world class infrastructure like modern integrated logistics cum transport hubs and freight corridors at major locations across the country will facilitate more efficient logistics operations. To help Indian logistics sector overcome the challenge and make them globally competitive it is imperative to remove the infrastructural bottlenecks and plan new projects taking into consideration the future growth requirements.

Rail Transport shortcomings:

Rail is a highly reliable, environmental friendly, safe and secure mode of transport. Indian Railways boast of the second largest rail network in the world, yet its share in goods transportation is much less compared to the share of roadways. In comparison with countries like USA, Russia and China, the cost of transport per tonne per kilometer in India is very high almost three times that of China. The railways has the potential to bring down the freight cost to greater extent with favorable commercial characteristics, dense and long-distance freight lines and strong flows of bulk products. The slow pace of progress in network expansion and modernization of existing facilities in the rail segment coupled with poor customer service has resulted diversion of freight traffic — even bulk items such as steel and cement — to the road sector. The market share of Indian Railways in total freight traffic has been falling consistently. While there has been some effort on the part of government to augment the Rolling Stock, there also has been significant emphasis on better utilization of the existing ones. It is commonly known that IT can be leveraged to improve the utilization of existing stock. This has failed to happen in India. A pilot project is being carried out to improve the Central and Zonal computer systems the implementation of the project however is still to see light. Freight trains travel on the same tracks as passenger trains at an average speed of 25 kilometers per hour causing considerable delays in transportation. Of course there are many other challenges like

wagon utilization, multi-modal transport, etc. Also, the public private partnership (PPP) model has been working better but is restricted to a few biggies owing to high entry barrier. However, the government has been active in taking steps to expand connectivity and regain the market share of freight business. Just by improving wagon utilization, the Railways have achieved a significant reduction of freight cost. Dedicated Freight Corridor Corporation of India (DFCCIL) has been established as a Special Purpose Vehicle under the Ministry of Railways to set up Dedicated Freight Corridors. In the first phase, DFCCIL will be undertaking construction two such corridors – Western and Eastern DFCs - across a total 2800 route km. This is likely to drive the establishment of industrial corridors as well as logistic parks along its route. With the proposed dedicated East-West corridor, goods trains are expected to ply at speeds of around 100 km/h. The logistic sector would be greatly benefitted and achieve higher efficiency if the Indian Railways is successful in implementing its plans for improved speed of freight trains, up-gradation of rolling stock, improved signaling and communication, setting up additional container depots and rationalization of the freight rates to remove distortions. Restructuring and corporatization of the railways will go a long way in meeting the formidable challenges of the future.

Clipped Aviation Logistics:

Indian aviation industry is one of fastest growing in the world and has seen rapid transformation over the years. Private airlines account for around 75 percent share of the domestic aviation market and dominate the industry with their full service airlines and low cost carriers. The air cargo segment of the aviation industry, one the important links in the country's economic growth, is also growing at a fast pace. A strong and dynamic aviation logistics network will provide a tremendous fillip to trade and the economy as a whole. Aviation holds a small share of India's freight market with air freight being very expensive in comparison to road and rail. There are not many cargo airlines, few attempts on this front have failed to take off. The demand for services, especially air cargo, is growing with the domestic air cargo traffic registering a 25-per cent increase in 2009-10. However India still accounts for meager 3% of the size of the world air cargo market which is estimated at 27 million tons valued at \$200 billion. The aviation logistics in the country is beset with numerous bottlenecks. Inadequate infrastructure is one of the major problems faced by the sector. India's air traffic is highly concentrated at a few airports with most of the second tier cities being ignored or having negligible facilities. Another major issue is the poor cargo handling facilities at airports across the country. Other issues like constrictions in inter-State movement of goods, the impeded movement of air cargo between second tier cities and gateway airports and scale of operations add to the woes, leading to lower cost efficiencies. The driver for growth in air cargo will be the demand and the enabler will be infrastructure. Infrastructure development and planning and distribution can prevent many of the bottlenecks faced by domestic air cargo industry. A growth in the volume would attract larger investments. The government can help by increasing the capacity of the airports in tier-II and tier-III cities and simplifying the processes with electronic data interchange (EDI), which would ease the paper work and speed up the transactions. Steps need to be taken to improve cargo handling facilities at all airports. Many interesting trends are taking place like the construction of an air cargo hub in tier II city of Nagpur in Maharashtra, rise in budget airlines and cargo

carriers with the relaxation in regulations. The cost of airfreight is expected to drop in the coming years which will open up new economic opportunities in India's second tier cities which are now being added to the air network. There are plans by many airlines to create full-fledged cargo operations and it is expected that these cargo carriers will also move to tier-II and tier-III cities. Even logistics companies are planning to acquire their own aircrafts. All these augur well for aviation logistics and as the demand for air cargo continue to grow steadily, it will attracting many more new players facilitating faster growth.

Core Infrastructure Bottlenecks

Transport	Infrastructure	Traffic	Key Constraints
Road	<ul style="list-style-type: none"> ■ Total road network – 3.32mn kms ▶ National Highway – 2% of road network (6% CAGR) ▶ State Highways – 4% of road network (2% CAGR) ▶ Major districts, rural & urban – 84% 	<ul style="list-style-type: none"> ■ Share of road in total freight traffic has gone up from 14% in 1950 to 65% in 2005 ■ National highways constitute only 2% of road network but carry 40% of road traffic ■ Freight traffic growth of 10% p.a. 	<ul style="list-style-type: none"> ■ India has the 2nd largest road network globally. Density of highway network in India (0.66km for sq. km of land) is similar to that of the US (0.65 km) ■ Narrow highways and poor surface quality resulting in higher lead time ■ Yet a highly competitive market offering one of the world's lowest freight rates
Railway	<ul style="list-style-type: none"> ■ Track length – 63,463kms (1% CAGR over 5 yrs) 	<ul style="list-style-type: none"> ■ Traffic handled – 728mn MT ■ Traffic growth - 8% CAGR over last 5 yrs. 	<ul style="list-style-type: none"> ■ Not been able to meet the shippers' capacity and required quality at acceptable prices
Ports	<ul style="list-style-type: none"> ■ Ports – 199 (Major 12 & Minor 187) ■ Capacity – Major ports at ~500mn MT and minor ports at ~230mn MT ■ Capacity growth – 9% CAGR over 5 yrs 	<ul style="list-style-type: none"> ■ Major ports – 463mn MT (~ 10% CAGR over 5 yrs) ■ Minor ports – 170mn MT (~ 16% CAGR over 5 yrs) 	<ul style="list-style-type: none"> ■ Major ports that account for 73% of maritime cargo are operating at over 90% utilizations ■ Outdated cargo handling equipment and limited spare capacity
Airports	<ul style="list-style-type: none"> ■ Domestic / Intl. airport – 127 nos. ■ 5 main metros account for over 85% of freight traffic 	<ul style="list-style-type: none"> ■ Traffic handled - ~1.3mn MT ■ Traffic growth of ~ 15% CAGR over last 5 yrs 	<ul style="list-style-type: none"> ■ Limited reach and a relatively smaller market in the past, has kept air freight rates at high levels

Discussion Point 8: The status of Indian transport infrastructure

Types of 3PL Providers

Transportation Based

- Services extend beyond transportation to offer a comprehensive set of logistics offerings.
- Leveraged 3PLs use assets of other firms.
- Non-leveraged 3PLs use assets belonging solely to the parent firm.
- Examples: Ryder, Schneider Logistics, FedEx Logistics, UPS Logistics

Warehouse/Distribution Based

- Many have former warehouse and/or distribution experience.
- Examples: DSC Logistics, USCO, Exel, Caterpillar Logistics, IBM

Forwarder Based

- Very independent middlemen with forwarder roles.
- Non-asset owners that provide a wide range of logistics services.
- Examples: AEI, Kuehne & Nagle, Fritz, Circle, C. H. Robinson, Hub Group

Financial Based

- Provide freight payment and auditing, cost accounting and control, and tools for monitoring, booking, tracking, tracing, and managing inventory.
- Examples: Cass Information Systems, CTC, GE Information Services, FleetBoston

Information Based

- Significant growth and development in this category of Internet-based, business-to-business, electronic markets for transportation and logistics services.
- Examples: Transplace, Nistevo

Discussion Point 9: The distinction between types of 3PL

Which one is suitable to us?

Categories of 3 PL Providers

- 1) Standard 3PL providers: this is the most basic form of a 3PL provider. They would perform activities such as, pick and pack, warehousing, and distribution (business) – the most basic functions of logistics. For a majority of these firms, the 3PL function is not their main activity.
- 2) Service developers: this type of 3PL provider will offer their customers advanced value-added services such as: tracking and tracing, **cross-docking**, specific packaging, or providing a unique security system. A solid IT foundation and a focus on economies of scale and scope will enable this type of 3PL provider to perform these types of tasks.
- 3) The customer adapters: this type of 3PL provider comes in at the request of the customer and essentially takes over complete control of the company's logistics activities. The 3PL provider improves the logistics dramatically, but do not develop a new service. The customer base for this kind of 3PL service is quite small.
- 4) The customer developers: this is the highest level that a 3PL provider can attain with respect to its processes and activities. This occurs when the 3PL provider integrates itself with the customer and takes over their entire logistics function. These providers will have few customers, but will perform extensive and detailed tasks for them.

Discussion Point 10: What value added services are provided by 3PL?

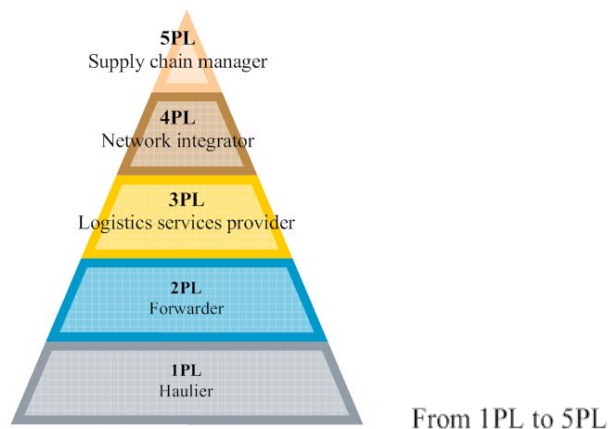
What is cross docking?

Examples of each of these categories & firms employing these services providers.

3PL Pyramid

The concept of 3PL has been developed from the need to extend transportation services by transportation companies to its customers. Basically, 3PL might be defined as outsourcing of transport and logistics activities to outside companies that are neither consignors nor consignees. Usually there is outsourced more than one activity, including storage, warehousing, and transportation. 3PL came into existence during the deregulation of freight transport industry in the 1980s and has progressed in the 1990s along with the development of information technologies.

The PL Pyramid (8) below from 1PL to 5PL might be described as a downstream change of functions in terms of transport/logistics services



Most small businesses buying and selling in the same location are 1PL. As the business expands geographically, the manufacturer's logistics border extends, a 2PL provider is generally a commodity capacity provider, such as a trucking company or a warehouse operator, a 2PL provides service for a single or a small number of functions in the supply chain. They face low returns, with high levels of asset intensity but low barriers of entry.

With the increasing demand for one-stop solutions, many 2PLs have evolved into 3PLs by adding new logistics capabilities and integrating their operations. It may or may not involve asset ownership. 3PL is a broader term that is frequently used to cover businesses in freight forwarding or contract logistics. It performs all or a large portion of a client's supply chain logistics activities and its value adding is based on information and

knowledge versus a non differentiated transportation service at the lowest cost. 3PL tends to be asset light with high returns. The 4PL provider is essentially a logistics integrator or a one-point contact for the manufacturer's logistics outsourcing requirements. They are responsible for contracting various 2PL and 3PL providers, and for assembling and managing those end-to-end solutions. The 4PL provider, with its complete overview of the supply chain as well as strong logistics and IT capabilities, can also offer high value added advisory services to the manufacturer. Most 2PLs companies strive to become 3PLs for higher returns. While 3PLs do own some assets such as key distribution centers in strategic locations or a small trucking fleet to fill emergency needs, they may have outsourced most of their capacity needed by 2PLs. Hence the terms 3PLs focus on logistics solutions and look for the optimal combination of assets available from capacity providers (i.e. 2PLs), 3PLs are less asset intensive. Their logistics management expertise makes them increasingly counter-cyclical – the worse the cycle, the more companies need to optimize their supply chains. Moreover, the more integrated the service of 3PLs, the closer they are to the customer's operation.

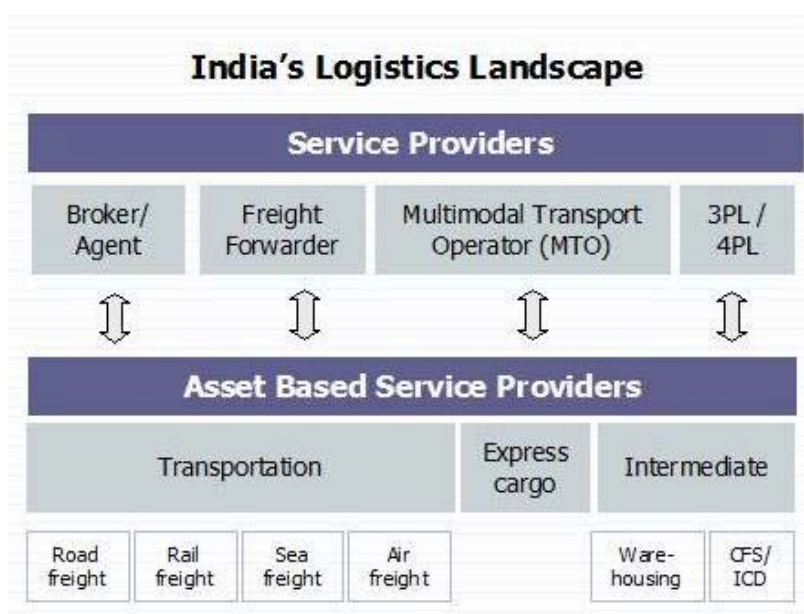
This closeness makes 3PLs indispensable to the customer, as the 3PL provider becomes more a partner than a supplier. A customer is more reluctant to change its 3PL provider than a 2PL. [9, 10]The services of 3PL sometimes overlap with the 4PLs. The 4PL segment is more lucrative because these companies charge consulting fees. Currently, 3PL companies are trying to turn themselves into 4PL companies in providing better service satisfaction to their related customers. We can say that 4PL is based on the development of 3PLs and as it is an extension of 3PL, it provides value added service such as planning, information technology integration, transport planning, order tracking and tracing, logistics consulting, application solution, and financial services. But all these functions focus on improving a close linkage with its served customer. From the logistics company to its consigners, as a 3PL company its task is to transport the goods from consigner to consignee, and to be a 4PL provider, 3PLs need to find ways to build strong relations between themselves and their customers, with the above mentioned supporting function to reach the highest level of service efficiency i.e., 4PL is integrated logistics management. [9, 10]There is also a new approach of logistics concept that might be defined as 5PL. The 5PL solutions focus on providing overall logistics solutions for the entire supply chain. Supply Chain Management (SCM) is the integration of the activities associated with the flow and transformation of goods in the respective logistics networks through improved supply chain relationships based on a common collaborative performance measurement framework for attaining close, collaborative and well-coordinated network relationships to achieve a competitive edge.

Discussion Point 11: Compare between different levels of Logistics Service Providers with examples.

Growth of 3PL Industry in India

3PL industry's origin in India can be traced back from the late 80's to mid 1990s. The industry was pioneered by global logistics majors as a part of extending these services to the Indian subsidiaries of multinational companies in automobile, electronics and FMCG sectors. Indian subsidiaries of multinational companies in these sectors took cue from their parent companies and began to outsource a share of their logistics functions to these specialist service providers. Though insignificant in the first few years, Indian 3PL industry is experiencing a rapid growth after year 2000 due to the liberalization of policy and opening up of Trade. The number of participants in this industry had grown to be more than 1200 by year 2010.

The Indian 3PL industry can be divided into three distinct tiers – National Major 3PL companies with nationwide presence, Regional 3PL companies with strong presence in one or two regions, and Small Remote 3PL companies.



How the traditional custom house agents or freight forwarders in India, transformed into 3PL operators?

Evolution of 3PL providers in India:

Trade has been the primary catalyst driving mankind's progress. Facilitating trade and the movement of cargo, is considered to be the oldest and most vital professions ever. Using the sea became the predominant route for the flow of cargo from one country to another. The presence of good harbors resulted in certain cities emerging as major trading centers. Rules were formulated and procedures set to regulate the inward and outward movement of cargo. The treasury department was in place at entry points to collect cargo tax.

As trading activities kept rising, the cargo handling task was gradually professionalized. These cargo professionals who facilitated the cargo movement became an integral part of the international trade to the extent of even collecting customs duty. By the latter half of 18th century, one generic expression 'Muccadam' had become synonymous with the professionals who guided the unskilled labor to handle the shipping and clearing of goods at harbor. In the early 1900's, custom clearance of cargo at Ports was handled by 3 kinds of people who were regulated by the Customs. Dalals was the oldest known category. They were responsible for preparing and processing the documents at the customs. Muccadams, as mentioned before, were responsible for physical handling of cargo. The 3rd kind were Clearing Agents, licensed by the Sea Customs Act 1878, who could work both as Dalals and Muccadams and further even had authority of signing customs documents on behalf of the merchants. The Sea Customs Act was followed by the Land Customs Act in 1924 and further by the Indian Aircraft Act.

By 1930's, the clearing agents was bridging the gap between merchants, The Ports and and the Customs. Post Independence, the Custom House Agents had a period of struggle, with the Government clamping down imports with controls.

During the 1960's, the New Customs House Agents Licensing Rules were framed. The licensing authorities felt the need to enhance the obligations and liabilities of the Agents who handled goods worth crores of rupees involving Custom revenue. The new rules proposed to merge all categories of agents and abolish individual identity of Dalals, Muccadams and Clearing Agents under a common category of 'Custom House Agent'.

With the changes in the licensing regulations, Clearing agents slowly shed their identity and started referring themselves as 'Custom House Agents'.

While importers and exporters studied only those items of trade, in which they were dealing, Custom House Agents studied volumes of import and export trade policies. It was essential for agents to familiarize themselves with the Customs Duty Tariff and Exim Policy. The Customs Reorganisation Committee of Parliament recommended that the Custom House Agent and their staff need to be made conversant about Customs Law.

This introduced stringent examination norms for agents in the Custom Agents Licensing Regulation Act.

By the early 1970's, agents were not just working as typical Custom House Agents, but were becoming responsible for moving freight from the point of manufacture to the ultimate point of consumption. Issuing and processing of documents from cargo origin to cargo destination, slowly started becoming a norm. The customers were demanding a single contract for total transportation. The year 1973 also saw the beginning of containers in India, 16 years after Malcolm McLean's idea of containerization that changed the basics of cargo transport.

Custom House Agents were evolving as cargo booking agents and cargo transporters. They became an important feeder of cargo to the International transport system. Insistence of efficient and careful handling, proper and regular scheduling at the most economic rate were some of the things the agents influenced in view of their control of cargo.

By the beginning of 1980, containerization was becoming a reality in India. Custom House Agents started consolidating cargo, initially for a single buyer procuring from multiple vendors. They began selling these new services to importers in foreign countries evolving into buyers' consolidators.

With the 1st ICD opening up at Pragati Maidan in 1983 and 5 year plans of Government giving thrust to develop more ports and ICD's, the scope of Custom House Agents activities also doubled. Agents started getting demands from customers to open offices in other parts where containers moved. The global customers also demanded that the agent have an overseas partner to service their cargo. The traditional role of acting as Custom House Agents had been supplemented and extended with the addition of multifaceted agency functions at the doors of shipping lines, the road lines, the ICD's and the CFS's, etc.

By the end of 2004, with the constant change in the international cargo transportation, both Air and Sea, the cargo industry witnessed the emergence and growth of a new breed of cargo intermediaries. These new breed got involved in many aspects of cargo like transportation, customs clearance, warehousing, distribution etc. This revolutionized the Custom House Agents trade and a new set of Agents started to evolve, which is now termed as 3 PL operators. However, they continued with their primary business of custom clearance of cargo.

The Trade started to identify these two categories of Custom House Agents and demanded value addition from Agents to their services. Further the growth of container traffic also brought new set of charges, other than cargo freight. These new charges disturbed the business of Custom House Agents' as they were the front persons between the EXIM trade and the carrier.

With the economic surge in India from early 2000, the process of moving and clearing cargo had extended to cover four stages, from transporting the goods from the factory of a manufacturer to the port, handling the customs formalities, arranging for the carriage to the destination port and delivery from the port of destination to the final receiver of the cargo, i.e. door-to-door. This process became easier with the containers and the new process of factory stuffing and destuffing of cargo at distant location from seaports. The American term of Non Vessel Owning Cargo Carrier (NVOCC) became a generic name to define these new cargo carriers.

Discussion Point 12: Growth & Evolution of 3PL in India

List of 10 CHA in Mumbai and Nhava Sheva established before 1984.

(CHA=Custom House Agents Licensed by the Ministry of Finance as per Customs Act 19620)

Tulsidas Khimji Pvt. Ltd.
 Sylvester & Co.
 Liladhar Pasoo (LP Group)
 Manilal Patel Clearing Forwarding Pvt. Ltd.
 ATC (Clearing and Shipping) Pvt. Ltd.
 Lee & Muirhead (Lemuir Group)
 Express Transport Pvt. Ltd.
 Clearship Forwarders Pvt. Ltd.
 Velji Dosabhai and Sons.
 Jeena & Co.

Services(Non-Exhaustive) offered by the above CHA's

	CHA	Port Handling	Stevedoring	CFS	Warehousing	Chartering	Transport	Insurance	VAS	Travel Agency	Projects	MTO
Tulsidas Khimji Pvt. Ltd.	●				●		●	●	●	●		●
Sylvester & Co.	●			●	●		●	●	●			
Liladhar Pasoo (LP Group)	●	●	●		●	●	●	●	●		●	●
Manilal Patel Clearing Forwarding Pvt. Ltd.	●				●		●	●	●			
ATC (Clearing and Shipping) Pvt. Ltd.	●				●		●	●	●			
Lee & Muirhead (Lemuir Group)	●				●		●	●	●			
Express Transport Pvt. Ltd.	●				●		●	●	●		●	●
Clearship Forwarders Pvt. Ltd.	●				●		●	●	●			●
Velji Dosabhai and Sons.	●		●	●	●		●	●	●		●	●
Jeena & Co.	●				●		●	●	●			

VAS :Value Added Services

includes

Palletising, Lashing, Crating, Customs Refunds, Consultancy, Fumigation, etc.

Approximate No. of Individual jobs handled by each CHA

	CHA	Port Handling	Stevedoring	CFS	Warehousing	Chartering	Transport
Tulsidas Khimji Pvt. Ltd.	9000				200 clients		8500
Sylvester & Co.	3000			20000	80 clients		2700
Liladhar Pasoo (LP Group)	8000	46000	52000		600 clients	200	12000
Manilal Patel Clearing Forwarding Pvt. Ltd.	7000				400 clients		9000
ATC (Clearing and Shipping) Pvt. Ltd.	8000				200 clients		12000
Lee & Muirhead (Lemuir Group)	12000 ^f				120 clients		6000
Express Transport Pvt. Ltd.	8000				300 clients		46000
Clearship Forwarders Pvt. Ltd.	7000				800 clients		2000
Velji Dosabhai and Sons.	11000 ^f		36000	14000	600 clients		39000
Jeena & Co.	14000 ^f				180 clients		1800

In considering the above jobs, value of each job is not considered.

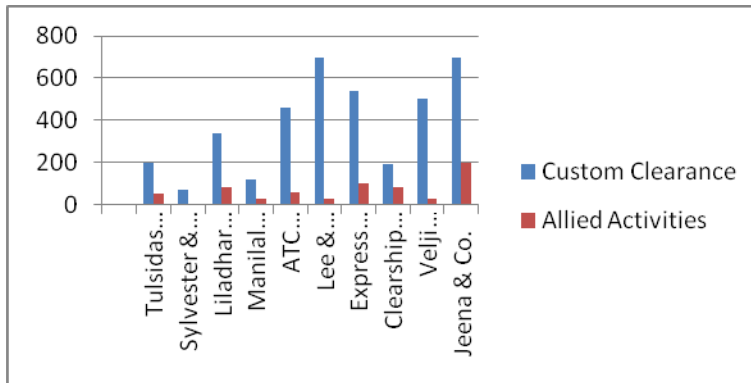
Company Turnover *

	Custom Clearance in crore Rs	Allied Activities in crore Rs.
Tulsidas Khimji Pvt. Ltd.	200	50
Sylvester & Co.	70	5
Liladhar Pasoo (LP Group)	340	80
Manilal Patel Clearing Forwarding Pvt. Ltd.	120	30
ATC (Clearing and Shipping) Pvt. Ltd.	460	60
Lee & Muirhead (Lemuir Group)	700	30
Express Transport Pvt. Ltd.	540	100
Clearship Forwarders Pvt. Ltd.	190	80
Velji Dosabhai and Sons.	500	30
Jeena & Co.	700	200

***a) Estimated based on no. of jobs, due to lack of data**

b) Custom Clearance includes all 3rd party payments like customs duty, Freight charges, etc

***Discussion Point 13: The services of Indian 3PL.
Should we call them 3PL?***



Based on above information and other information obtained from the companies, a few points that can be inferred are:

- 1) The main/core business activity is Custom Clearance/CHA.
- 2) Other activities like Warehousing, Transport, etc have been due to demand from CHA work that they were involved in.
- 3) All the companies have expanded their scope beyond Mumbai and operate at at least 3 other locations.
- 4) All companies have employee strength of more than 50 altogether.
- 5) Everyone believes that CHA's are a specialized and professional setup and Govt. should consider them at par with CA's, Lawyers, etc.
- 6) All the companies are family owned, but now professionally managed businesses.
- 7) All of them started as small time agents managed by owner and family.

Questionnaire Survey: To understand the above aspects.

Q1) What is your core activity?

Q2) How did the expansion from CHA business into other Value added services happen?

Q3) Where is the corporate Headquarters?

Q4) What is your employee strength?

Q5) Do you believe CHA's are comparable to other middlemen/brokers?

Q6) How did you enter this line of business? What is your organization structure?

An interesting finding based on verbal talk, while addressing the above questionnaire is as below.

- 1) Most of them started as family owned business. With passing success, more members joined in. With additional membership from the family, it was essential to increase the volume of business, which is why many companies started offering value added services. This was also the reason for operating at more than 1 location. Most of the organizations have segregated the business to avoid legal tangles. Many appointed consultants to streamline the activities and now find it easier to operate with professional skilled personnel.

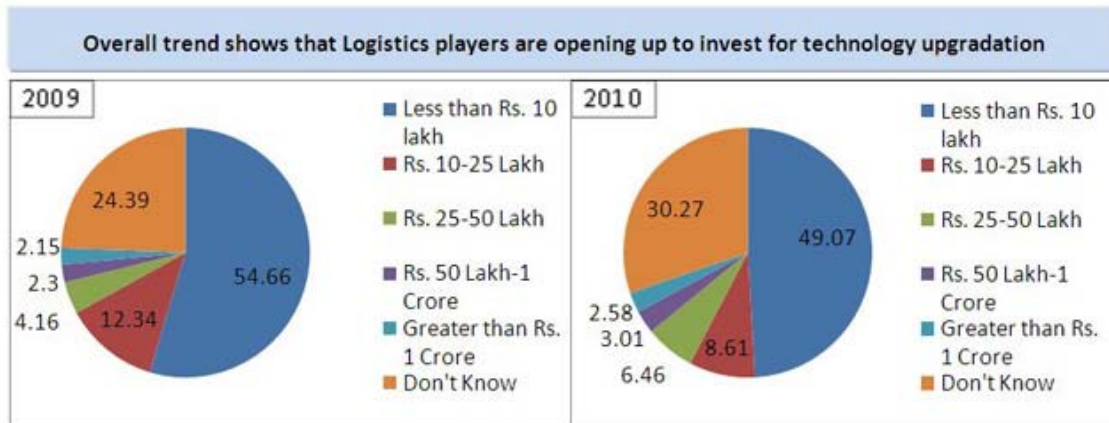
- 2) With some companies having their 4th Generation in the business, who have professional management degrees, these companies have started marketing their Value Added Services as 3PL/4PL. Many of the services like consultancy were and is still offered free of cost by CHA's.
- 3) Many of the companies complained that there was no unity amongst members as is desired. This was the reason for Trade to take undue advantage by abusing credit period and defaulting on payments.
- 4) Surprisingly, no one admitted of being felt threatened by MNC's in the 3PL business, because the scope of coverage offered by Indian Companies is much more than what MNC's offer. They say that in India, Custom Clearance , is yet a major factor in offering smooth supply chain and this being the core business, they are confident of offering better services than MNC's.
- 5) When asked about the integration and management of varied business groups, all of them replied with a **definitive inclination towards adoption of IT**. They confirmed that the main reason for their success was their strong IT infrastructure, which is the need of the day.

A survey by Softlink Technologies regarding the IT adoption by Logistics sector is an interesting read at this point.(Source: www.softlinkglobal.com)

The Indian logistics sector is generally perceived to be reluctant in investing in IT. Several factors like the unorganized and fragmented nature of the sector, lack of regulatory compulsions and the outlook of the players in considering IT as an expense rather than an investment are said to have contributed to the low penetration of IT in this sector. The logistics sector in India is often accused of driving up the prices and increasing operational costs. IT can play an important role in cutting transaction costs by streamlining the process of the company. The survey aimed to understand penetration and usage of IT in the sector.

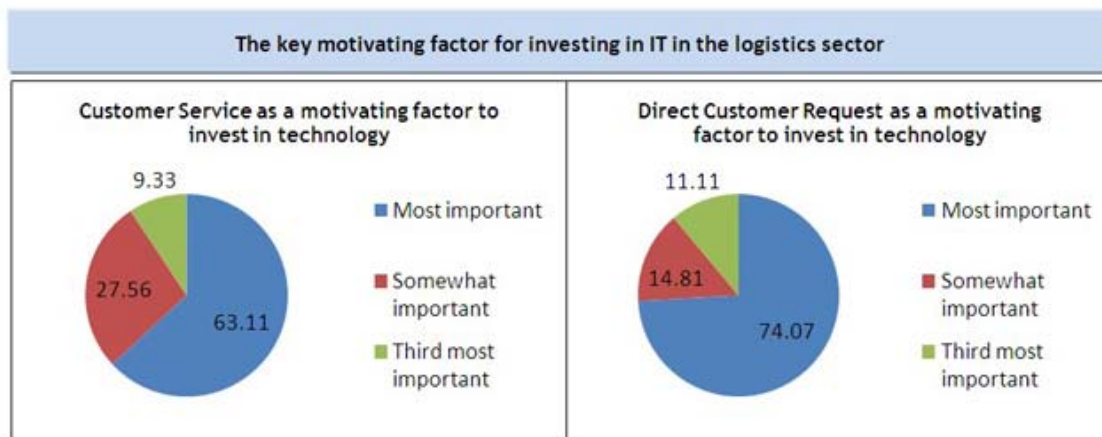
An astounding 700 logistics players from fifteen cities across India, consisting of SMEs and large players participated in the online survey. Of the overall respondents 13.92 percent were large players (3PLs & NVOCCs) and 86.08 percent small players (Freight Forwarding & Customs Clearing). One of the major finding is that, despite global recession and overall gloom in the market, the large players in the logistics sector are very much bullish on investing in IT. The SMEs in the sector have continued to invest steadily in IT, with certain percentage being uncertain about the level of investment. The findings have also highlighted some of the key factors which influence the logistics companies to invest in IT. Customer interaction which is very crucial for any business has always been one area in which Indian companies are considered to be falling short.

The general overall trend appearing is that the Indian logistics players are opening up to investing more in IT. This has shattered the myth about logistics companies being slow in adopting technology. In a comparative study of 2009 and 2010 it is seen that there is a drop in the number of companies investing less than 10 lakhs and between 10-25 lakhs in IT, by 6 percent and 3 percent respectively. The numbers of companies investing more than 25 lakhs in IT have risen. The state of the global economy and market has resulted in several players being uncertain about investing in IT. A significant 30 percent of the respondents have said they are still undecided on the IT budget for 2010.



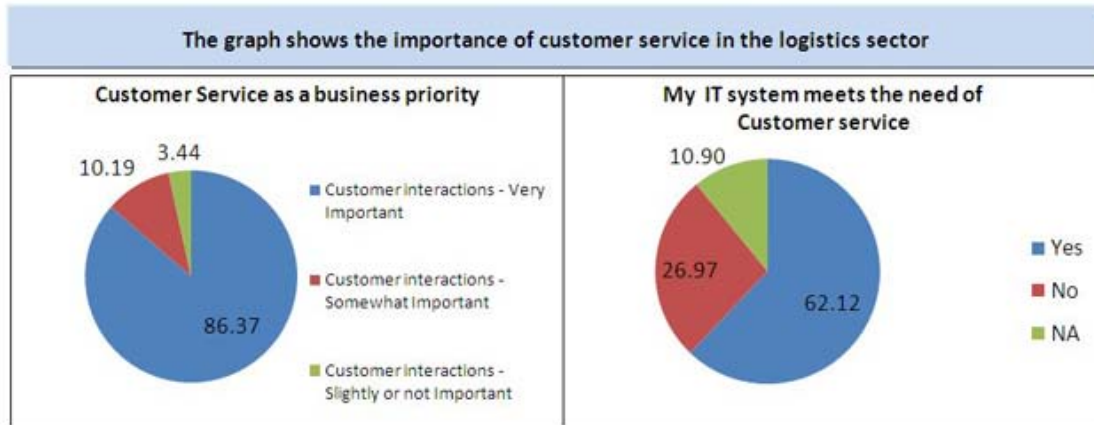
In the SME segment too, 30 percent of the respondents were still undecided on the IT budget for the year 2010 and investments in technology to the tune of 25 lakhs and below saw a drop of 8percent compared to the previous year. Among the large players only 7 percent of the respondents have invested between Rs. 25 lakh and Rs 1 crore for the year 2009. However the budget for technology investment for the year 2010 has increased to nearly 14 percent. 36 percent of larger players are yet to decide on their budgets for 2010 due to uncertain economic conditions.

It has been the general perception that the SMBs in this sector have been reluctant to adopt IT in a big way. Given this scenario, one of the aims of the survey was to learn about the key factors that would influence a logistics company to invest in IT.



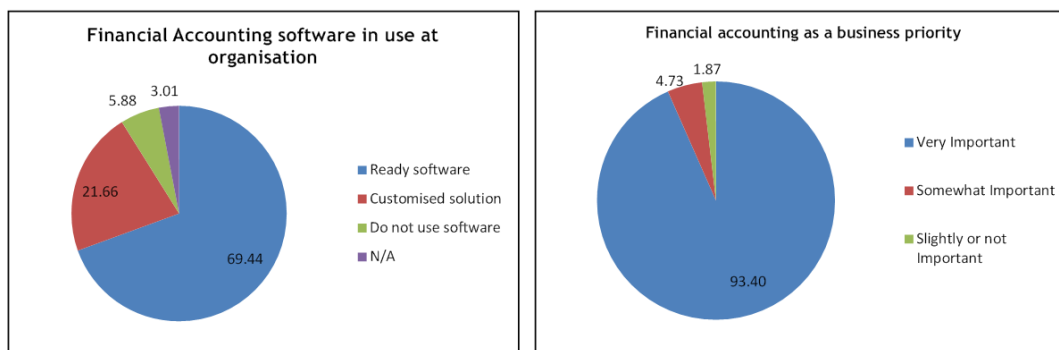
Responses to the survey reveal that one of the major stimuli for the SMBs in this sector for adopting IT is improving Customer Service. A majority of 91 percent of the SMB respondents have highlighted improving Customer Service as the key driving factor to invest in IT. The other key factors are Direct Customer Request (84 percent) and Operational Efficiency (73 percent) respectively.

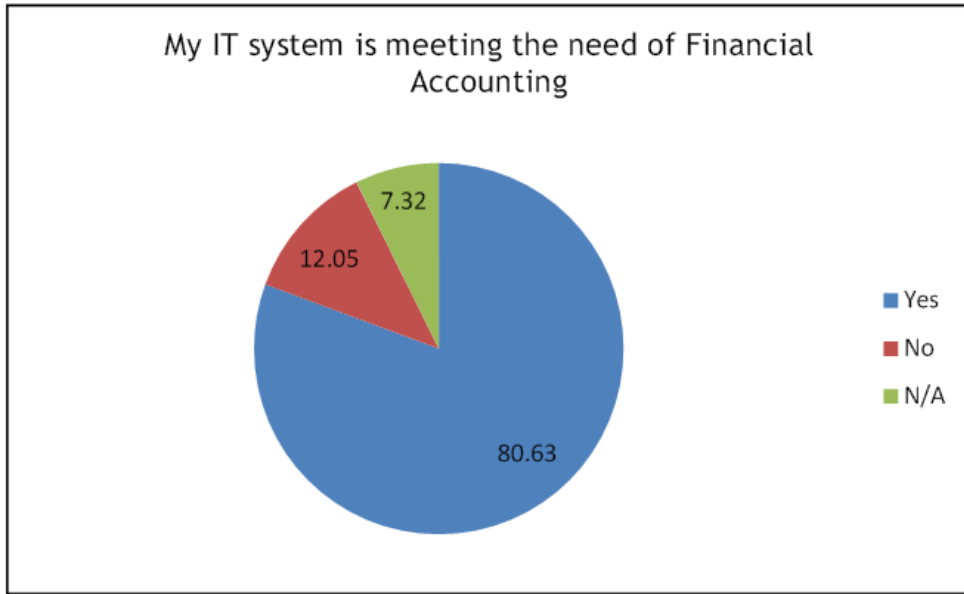
Another major finding of the survey has been the importance of Customer Interaction. Customer interaction is one of the most important aspects of the logistics sector and is critical for continued customer relationships. It is also one of the most overlooked areas and can hamper the growth of the company.



Although majority of the respondents have agreed that customer service is a business priority, at the same time many of the players said that their current systems were not equipped to help provide effective customer service. Research shows that Customer Service is being viewed very seriously by 97 percent of the SMB respondents who considered it to be very important for their business. At the same time 39 percent felt that their existing IT systems were not designed to help them enhance their Customer Service. The large players too echoed the same sentiment as the SMBs with around 96 percent of the respondents saying that Customer Service is an important aspect in their businesses. And 34 percent respondents highlighted that their existing IT systems do not match up to their Customer Service requirement. The IT systems for Regulatory and Commercial documentation, which form the core of the operations, need to be adaptable and scalable to the growing need of the segment, the survey results indicate. 26 percent of the respondents have complained that their current systems are not capable of meeting their growing requirements. The survey also touched upon the IT systems for Financial Accounting. There is a very high usage of accounting systems in this sector. However 19 percent still feel that their current IT systems do not fulfill their entire accounting needs.

Existing technology for Financial Accounting is not meeting the requirements to the fullest amongst Indian Logistics segment





This survey and my above findings of the large 10 players, got me to probe into the business of the small (or those who choose to remain small) players. *I wanted to find out whether the small players were IT inclined and whether lack of IT adoption was a reason for their being small.*

Discussion Point 14: Profile of Indian 3PL Companies

List of 10 small CHA's in Mumbai and Nhava Sheva.

(CHA=Custom House Agents Licensed by the Ministry of Finance as per Customs Act 19620)

Phalna Shipping Agency
Prabhu Shipping agency
Suvidha Kgp Forwarders Pvt. Ltd.
Multimodal Forwarders Pvt. Ltd.
Asha & Co.
Atool & Associates.
Rajesh Clearing and Forwarding
Rajpal Sharma & Co.
Quick Clearing Agency
R.S.Khandalkar & Co.

Services offered by the small CHA's

Most of the CHA's were solely providing Custom Clearance work and Transport co-ordination services. None wanted to take on additional risk or involved capital to provide Value added services.

Approximate No. of Individual jobs handled by each CHA

The number of CHA related jobs handled varied from 300 per year to 3000 per year.

Company Turnover

The estimated turnover ranged from Rs 3 crores to Rs 60 crores.

A slightly different questionnaire was administered in this group and the results were as below.

- 1) The main/core business activity is Custom Clearance/CHA.
- 2) Activities like Warehousing, Transport, etc will involve additional capital and they donot want to 'enter that vicious cycle' of credit.
- 3) Most of them operate only at Nhava Sheva and Mumbai. They do not risk the trouble of appointing an associate to handle work at other ports.
- 4) The employee strength was 8~30 persons..
- 5) All the companies are owner bossed companies. All decisions are taken by owner/partners
- 6) Most of them were working for some big logistics firm and decided to start on their own somewhere in the midst of their careers.

The questionnaire administered was as below.

- Q1) What is your core activity?
- Q2) Why have you not expanded from CHA business into other Value added services?
- Q3) Where locations do you operate from?
- Q4) What is your employee strength?
- Q5) Explain your organisation structure?
- Q6) How did you enter this line of business?

Some interesting finds were as below:

- 1) Not many wanted to expand, since they were the only ones looking after the total business. All activities related to Accounting, HR, etc were decided by the owners and they did not have time for expansion.
- 2) Many did not want to expand, since they did not have a succession policy in line.
- 3) Many thought that concentrating on a single client or a single type of clientele provided them with core competency and they could market their services better.
- 4) Only 3 out of 10 used a computer to file customs documents online. Rest followed a manual way of using services of CMC.
7 out of 10 used a computer for financial purpose.
9/10 had a single computer in office shared for all purposes.
All of them believed that IT adoption is not mandatory for success.
- 5) 80% lacked any professional qualification like MBA, CA ,etc.
- 6) All of them thought that staying small was essential to reduce overheads that are prevalent in large companies.

Discussion Point 15: Profile of small player.

Conclusion after surveying the large players vis-à-vis small players in the logistics sector.

- 1) Risk taking is an important factor.
- 2) Education (formal or informal) plays an important role in success.
- 3) IT implementation is of key importance in today's world.

Discussion Point 16: Distinction between large and small Indian 3PL Companies

3PL Services from a user's perspective

Why do Companies Outsource Logistics to 3PL providers.

With the increasing focus of business expansion into the global market, companies need to have an extremely lean and efficient supply chain to achieve success and integrate into global markets.

3PL providers can not only help provide services to these companies, but also assist the more localized companies looking to cut operational costs or focus on core competencies.

There are many advantages to outsourcing logistics services to third parties which are mentioned below.

- Focus of Core competencies.
- Cost Reduction for Manufacturers by freeing up own resources.
- Risk sharing.
- Access to resources like shipment tracking and real time tracking.
- Better Cash Flows with funds not locked in Inventories, Transport costs, etc.
- Constant Changes in Regulatory Framework (e.g. Free Trade Zones, Exemptions, Customs EDI, VAT, etc.) can be updated by the 3PL service provider.

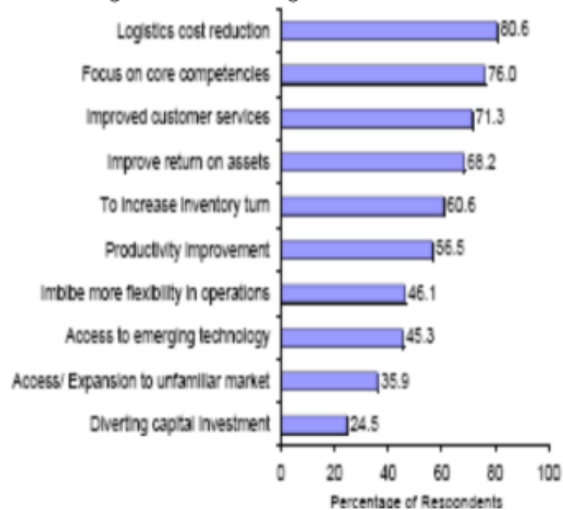
Some reasons for outsourcing

Some of the typical drivers for organizations across the world to outsource their logistics activities include:

- Globalisation. With globalisation and ease to trade, organisations are increasingly sourcing, manufacturing and distributing on a global scale. This renders their supply chains extremely complex to manage. Thus their logistics activities are increasingly being farmed out to experienced 3PLs, who have global reach, sophisticated IT platforms, and state-of-the-art transportation networks.
- Effectiveness. Logistics may not be the core activity of an organization. By outsourcing logistics, organization can re-focus on their core competency and thereby, manage their resources more effectively.
- Cost. By outsourcing logistics, organizations can reduce both fixed and variable costs as the 3PLs can leverage on their economies of scale which is sometimes not available to mid-sized regional manufacturers.
- Customer satisfaction. Ideally, logistics outsourcing improves the cycle time and delivery performance, thereby increasing customer satisfaction throughout the chain.
- Value-added services. Since 3PLs now offer a range of value-added services, such as multi country consolidation, channel management, after sales services, and life cycle management, organizations can benefit from the richness of such services.

3PL Survey in India

Reasons for Logistics Outsourcing



Source: TCI & MDI Survey

A survey by the Transport Corporation of India (TCI) and the Management Development Institute (MDI) shows

- less than 55% of Indian companies subscribe to 3PL, compared to more than 75% globally.
- about 57% of the companies plan to outsource reverse logistics within the next five years.
- 54% plan to outsource inventory management
- 53% order processing.
- more than 50% of the companies have outsourced activities like transportation, warehousing & customs clearing/forwarding.

***Discussion Point 17: What is reverse logistics
What is order-processing
Reasons for outsourcing of logistics function by Indian
Companies***

Selecting a 3 PL Service Provider

Today, 3PL's are more than just transportation providers; they are becoming involved in the long-term strategic direction of their client companies. The key to successful outsourcing of logistics services lies in finding a 3PL provider that has the most strategic fit with the company's goals. The most important step in selecting a 3PL provider is to ensure the decision is a collaborative one made by representatives of all departments within a company.

Meritex Logistics in the USA have come up with a 9 step plan for companies in deciding a 3PL service Provider.

1. FORM A CROSS-FUNCTIONAL TEAM
2. SET OBJECTIVES
3. DETERMINE CUSTOMER SERVICE REQUIREMENTS
4. DEVELOP A LIST OF CANDIDATES
5. EXPLORE INTEREST AMONG 3PL CANDIDATES
6. SOLICIT REQUESTS FOR PROPOSALS
7. VISIT THE PROSPECTIVE PROVIDER'S FACILITIES
8. REVIEW QUALIFICATIONS
9. IMPLEMENT THE SELECTION PROCESS AND CHOOSE YOUR BEST CANDIDATE

To understand the users perspective, I have surveyed 2 of our clients using our services for their international cargo management.

Our Company:

D.R.Kulkarni Logistics Pvt. Ltd is a 65 year old Custom House Agent having its own license at Mumbai, New Delhi, Nhava Sheva and using associates at Kolkata, Chennai, Cochin. It also has its own Multimodal Transport Operators License under its sister concerns name. The group turnover for the last Financial year was approximately Rs 100 crores.

2 Companies understudy are

Pidilite Industries Ltd. & McCain Foods India Pvt. Ltd.

Pidilite Industries is the market leader in adhesives and sealants, construction chemicals, hobby colours and polymer emulsions in India. Their brand name Fevicol has become synonymous with adhesives to millions in India and is ranked amongst the most trusted brands in India.

Pidilite is also growing it's International presence through acquisitions and setting up manufacturing facilities and sales offices in important regions around the world. Fevicol is now the largest selling adhesives brand in Asia.

The Group's turnover is about US \$ 350 Million for the year 2006-07.

Our product range includes Adhesives and Sealants, Construction and Paint Chemicals, Automotive Chemicals, Art Materials, Industrial Adhesives, Industrial and Textile Resins and Organic Pigments and Preparations. Most of the products have been developed through strong in-house R&D.

Since its inception in 1959, Pidilite Industries Limited has been a pioneer in consumer and specialties chemicals in India. Over two-third of the company's sales come from products and segments it has pioneered in India.

McCain Foods India (Private) Ltd. was established in 1997 when McCain began importing potato products to a country where potato consumption was already well established.

Facilities:

1997 – New Delhi sales office opens.

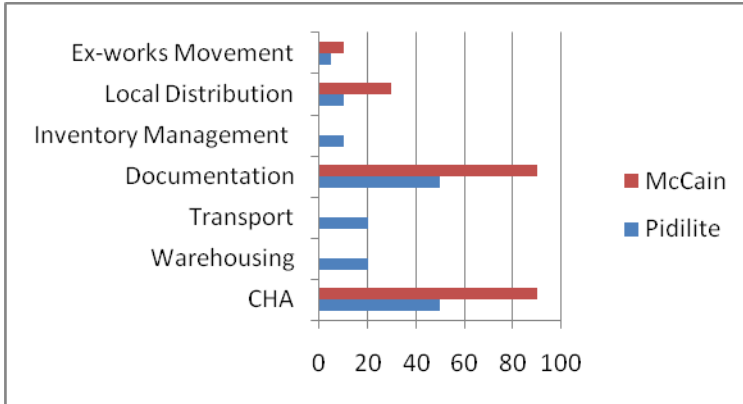
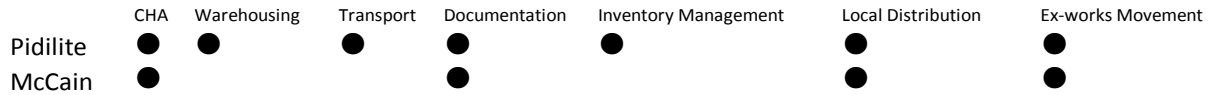
2006 – Plant opens in the Gujarat province to produce retail and foodservice French fries, and potato specialties. Among the potato specialties the plant will eventually produce are a number of popular Indian style potato snacks. The plant supplies markets in Sri Lanka, Pakistan, Bangladesh and Nepal, as well as India and exports 10-15 per cent of its output to South and South-east Asian countries and the Middle East.

McCain is the most famous Canadian brand name in the world. They manufacture frozen food products, such as French fries, appetizers, pizzas, vegetables, desserts, juices, entrees and oven meals. Their foods are being served in restaurants, sold in grocery stores, and adding nutritious flavour to family dinners. From their roots in Florenceville, New Brunswick, Canada, McCain has grown to become a global leader in the frozen food industry operating 53 facilities worldwide and generating annual sales of over Canadian \$6B.

	Imports(FOB value in Rs. crores)			Exports(FOB value inRs. Crores)		
	2008-2009	2009-2010	2010-2011	2008-2009	2009-2010	2010-2011
Pidilite	7000	9600	13000	3800	5400	8900
McCain	1200	3200	6800 NA		2	9

Both the companies started a relation with our firm by entrusting their custom clearance activities. McCain Foods India Pvt. Ltd started in the year 2003 and Pidilite Industries started in the year 2005.

As of today the below service are offered along with Custom Clearance.

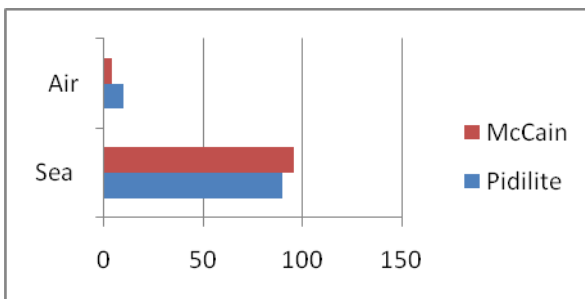


Values shown are as a percentage of total Activities of the Companies.

For Pidilite Industries, DRK Group handles all activities right from arranging Ex-Works Pickups to Door Delivery. For Documentation, there is an implant, who integrates our system with their ERP systems, since the same system could not be given access to in our office due to security reasons. DRK group handles end to end solutions for 3 products in their product line and handles 1 or more activities, for nearly 23 other products.

For McCain Industries, DRK Group handles 4 activities of the listed 7 activities, since their products require reefer warehousing and transport. DRK is in process of setting up cold storage and reefer transport, so as to offer end to end solutions.

Mode of Transport used



As a percentage of total imports/exports

Both firms extensively used Sea Transport as their primary mode due to cost savings vis-à-vis Air Transport. Air Transport is used for time bound or Valuable shipments.

For local transport or distribution, Road Transport is the only option for McCain India, since cargo requires temperature controlled vehicles and only option available is by road.

Pidilite uses Road Transport for 95% of their distribution activities, 4% by Domestic Air and 1% by Railways. This can be attributed to the fact that many of the chemicals are hazardous in nature and Rail and Train transport of hazardous material is restricted to a greater extent.

Costing of services

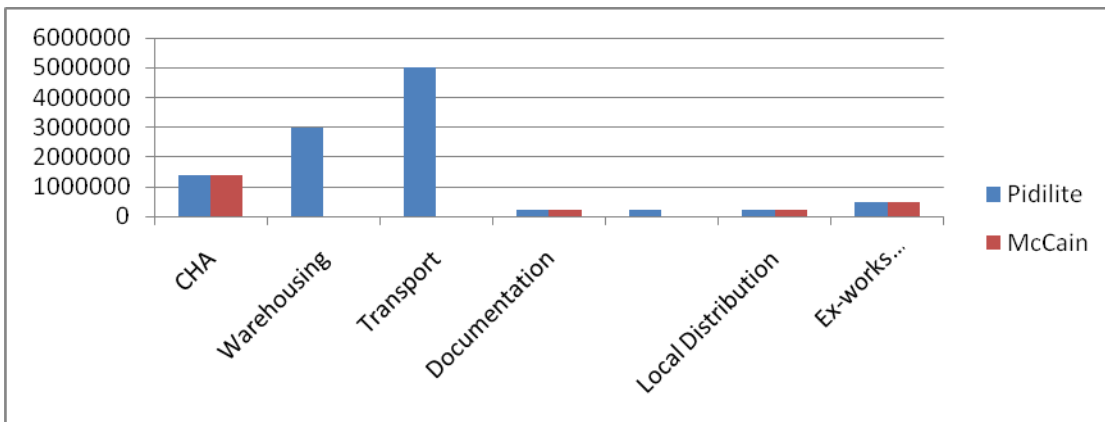
To determine whether the companies actually had some cost saving on account of outsourcing their logistics activities, I tried to calculate how much of the costs involved in offering the 3 PL services costs our company (apportioned approximately) and likewise what it would cost the 2 companies not to outsource.

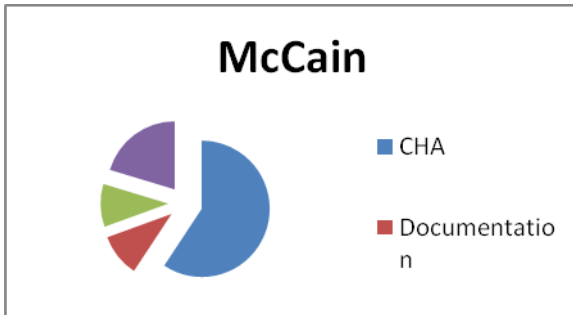
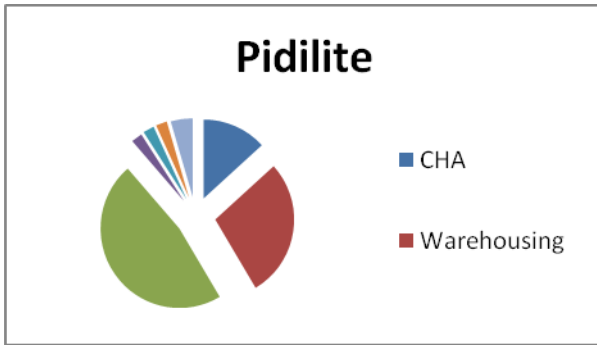
Service Charges are based on below factors.

CHA	Warehousing	Transport	Documentation	Inventory Management	Local Distribution	Ex-works Movement
based on CIF assessable	based on space occupied	based on distance covered	lumpsum	lumpsum	based on landed costs	based on volume

1. The below costs mentioned in Indian Rupees.
2. The costs towards CHA, Documentation, Inv. Mgmt, Local Distribution and Ex works movements are calculated using apportioned annual salaries paid to the staff for performing the activities.
3. Cost of Warehousing is for hiring warehouse space for a year.
4. Transport costs includes annual installments towards purchase of vehicles, maintenance and drivers salaries for running the vehicles.

	CHA	Warehousing	Transport	Documentation	Inventory Management	Local Distribution	Ex-works Movement
Pidilite	1400000	3000000	5000000	240000	240000	240000	480000
McCain	1400000	0	0	240000	0	240000	480000





Discussion Point 18: The Pidilite and McCain experience in logistics

Conclusion

Thus, we can conclude that even though the companies pay abovementioned amounts towards outsourcing their logistics functions, if they had to perform the activities on their own, they would have to spend more than what they pay for outsourcing. This is because one of the advantages of using 3PL results from economies of scale (merits from large truck fleets, warehouses, etc.) and economies of scope, which encourage companies to increase net value by reducing costs. The effects of these economies are obtained depending on the type of 3PL Provider. Competent 3PL providers possess high coordination ability, enabling them to search for reliable partners or sub-contractors, and to manage efficiently the inter-firm flow of goods. Such ability can be developed through experiences as a 3PL. Likewise, by outsourcing logistics activities, companies can save on capital investments, and thus reduce financial risks. Investment in logistics assets, such as distribution centers or information networks, usually needs large and lump sum costs, which involves financial risks.

Generalizing the Indian firm that outsources logistics a few key points can be pointed out:

- 1) Indian Companies primarily outsource custom clearance because of the Bureaucracy, Red Tapism and Corruption. Since they cannot indulge themselves, they appoint a CHA who can “manage” the agencies.
- 2) In spite of computerization of custom clearance, there are many loopholes in the system, that can be used by authorities to delay clearance. A dedicated CHA can “speed up” things.
- 3) They use services of a CHA to obtain cheap or free credit by making him pay all dues and settling payments later.
- 4) Transport laws are different in different states (e.g. weight restriction in Gujarat). Companies find it convenient use a dedicated transporter to handle inland haulage.
- 5) Physical Movement of cargo inside ports or airports still needs to be ‘administered’ without which delays can happen, which is why a 3PL is appointed to speed up movement.
- 6) Warehousing of different material needs expert knowledge. Companies dealing with different categories of material find it convenient to outsource warehousing to experts.
- 7) Pre and post shipment documentation takes a lot of time and companies find it convenient not to waste a personnel doing follow up work.
- 8) Intelligent Freight routings are handled best by a Freight Forwarder leading to economies and saving in transport costs.

Although there are several advantages of using 3PL [11], some drawbacks also exist. It is not easy to establish a reliable and cost-effective partnership between the firm and the 3PL provider. In order to establish reliable partnership, efforts should be made in two stages: 3PL provider selection and contract signing. Firstly, in the stage of selecting a new 3PL partner, it is important to select the 3PL provider who has the ability to provide better services. If the firms cannot select reliable 3PL providers, they may suffer from economic losses. It is not easy for firms to judge the ability of the 3PL provider during

the selection stage owing to the issue of information asymmetry between the firm (principal) and the 3PL provider (agent). To solve this problem, complex selection procedures are necessary to identify their ability. However, the complex selection procedures may involve additional transaction costs. Secondly, it is important to establish a system to maintain their reliable partnership once the 3PL partner is selected. Information sharing and apparent risk sharing between the parties is always required. Concerning information sharing, it is needless to say that smoother information exchange will result in a more efficient logistics activity. However, related costs may increase if some information essential to the firm has leaked out. Therefore, the commitment of each party in information sharing is required, and a scheme to ensure these commitments has to be prepared. However, this would also involve additional transaction costs. Constructing a risk sharing scheme between the firm and the 3PL provider is critical in establishing a reliable partnerships. Some of the risks involved in using 3PL are demand risk, inventory risk, and financial risk, among others. The questions are on who will take these risks, and how to compensate the risk holders. Gain sharing” is a popular example of a rewarding scheme in which the 3PL provider holds part of the risks, and then is given incentives based on the increase of the firm’s profit. This risk-sharing method is apparently some sort of a division of work between the firm and the 3PL provider. Establishing good risk sharing also involves transaction costs, although the associated costs can be reduced through the cumulative experiences and IT development .In order to make a decision whether it is useful to outsource its activities the company defines logistics costs.

3PL services: Capabilities, Opportunities and Challenges in India

Success in today’s business depends on superior supply chain planning and execution. Supply chain speed and flexibility have become two key levers for competitive differentiation and increased profitability. Within a global trade environment, one of the biggest challenges is the ability to manage seamless forward and backward flows of material and information. Faced with increased global competition in the past two decades, a popular strategy adopted by many successful companies to address these challenges involves outsourcing logistics and supply chain activities/processes to reliable third party logistics providers (3PLs) and focusing on core competency.

Globalization, development of information and communication technologies, as well as supply chain network optimization is reshaping trade flows. In the future, the logistics outsourcing industry will be more global, diversified and concentrated. With the help of state-of-the-art technologies, more 3PLs will be gearing up to meet the demand growth and improve their services offerings by incorporating newer value-added services and customizing their supply chain management solutions.

Indeed, logistics outsourcing continues to expand in the Asia-Pacific. With more than 84 per cent of companies operating in the Asia Pacific relying on 3 PLs, the logistics outsourcing industry in this region greatly attracts global 3PLs notably in countries like China and India. However, challenges, such as poor infrastructure, complex regulations and industry readiness, still remain.

Logistics Outsourcing Practices: A summary

Outsourcing of non-core operations is now an accepted major trend in many industries. Manufacturers have been turning to 3PLs to manage their increasing global supply chains. Meanwhile, there are also companies seeking to outsource the management of their supply chains to obtain reliable logistics services albeit at a lower cost. How 3PLs respond to this growth and to the challenges of meeting exacting customer demands is thus critical.

Since 2002, the use of 3PLS services has been growing. According to the Third-Party Logistics Report (Georgia Institute of Technology, 2009), the percentage of firms using 3PL services in Western Europe lies between 76 per cent and 79 per cent. In Asia-Pacific, this percentage has been 84 per cent in 2004 and 83 per cent in 2005, respectively. Considering the high percentage of using 3PLs worldwide, logistics outsourcing services offered by 3PLs continue to consume a considerable portion of overall outsourced logistics and supply chain budgets.

Outsourcing services provided by 3PLs

To continue to satisfy customer requirements, the 3PLs service industry is also evolving to offer greater scope and more integrated solutions. While 3PLs continue to offer the basic traditional logistics services (e.g. custom clearance, transportation and warehousing), they also provide integrated logistics solutions, such as vendor management and inventory financing.

There are three levels of outsourcing:

- **Transactional Outsourcing.** *This is based on cost and activity transactions, with no long term contracts and partnership between the 3PL and outsourcing company.*
- **Tactical Outsourcing.** *This mode of outsourcing is practiced on a mid-to-long term basis with negotiation contracts and integrated IT systems to facilitate better information flow and to create supply chain visibility.*
- **Strategic Outsourcing.** *In this level, sometimes known as best sourcing in some sectors, long-term relationships are formed, with successful outcomes and 3PLs become key partners in a company's supply chain management and transactional transparency is maintained on a mutual trust basis.*

In the early years, 3PLs only provided core services such as transportation, warehousing and Customs clearance. At this stage, the relationship between the 3PLs and the customer was strictly contractual, and services were charged by transactions. Later on, with an extended service scope, 3PLs began to provide both core and extended services, including inbound and outbound-centric 3PL services and freight forwarding. Nevertheless, the relationship remained contractual and services were charged either of transactions or based on fixed pricing. Both of these two stages are

labeled as transactional outsourcing as no bond exists between the 3PL and the customer.

As customers seek integrated supply chain services, Lead Logistics Providers (LLP) evolved to serve them. Such LLPs are usually large global logistics players who have the capabilities to execute all of the logistics activities within their organization. At this stage, the LLPs share information as well as risk with their customers. Although the relationship between service providers and customers remains contract based, the duration of this contract is mid-term or long-term and risk sharing becomes evident.

In the last stage, the 3PL become a strategic partner with the customer. Risk and benefits are mutually shared. The relationship is transformed from contractual to one of collaborative partnership.

Logistics Activities Outsourced

As end-to-end supply chain integration, supported by sophisticated technologies, becomes a reality, customer's needs and expectations of the service provided by 3PLs begin to grow in breadth and depth.

According to the 2009 Third Party Logistics Report (Georgia Institute of Technology), the activities most frequently outsourced to 3PLs globally are outbound transportation, warehousing, Customs clearance and brokerage, inbound transportation and freight forwarding, respectively.

The activities most frequently outsourced are those that are more asset-intensive and require greater labour content, such as outbound transportation and transportation management. Conversely those activities that are less frequently outsourced tend to be more technology-intensive and require greater knowledge content such as product assembly/ installation/ manufacturing, information technology and LLP/4PL services.

In addition, while most organizations are happy to transfer their physical warehousing operations to 3PLs, less than 10 per cent of them place their inventory ownership in the hands of the supply chain experts. Likewise, less than 20 per cent of the organizations outsource their information systems, perhaps suggesting a low level of confidence in the 3PLs capability in secure data management and reluctance to provide information transparency.

Focusing on the Asia Pacific, the traditional logistics services such as outbound transportation, inbound transportation and warehousing are being outsourced by most organisations. However, different from the other regions, organizations in the Asia Pacific also tend to rely on the value added logistics services provided by the 3PLs, such as order fulfillment and distribution (52 per cent), inventory management (36 per cent) and customer service (15 per cent).

According to Mr. Karim Alhusseini of Eastern Corporation and a CapGemini Accelerated Solutions Environment Participant (2005), the "future expectations of a

3PL are to do more than labour-intensive and tactical activities, but to expand into consultation/ implementation services that integrate the 3PL systems and tools with out applications for turnkey solutions”. His opinion is that execution processes are far easier to outsource. However, to improve competence, organizations need to rely on capabilities provided by 3PLs to ensure sufficient depth of talent in the key service offerings.

Opportunities and Challenges in India

The Indian logistics industry has evolved from being labour intensive during the 1960s to the present technology oriented system, which produces a wide range of logistics services. The concept of 3PLs is recent. Traditionally, manufacturers in India have managed their own logistics requirements. Gradually, Indian organizations outsource their labour requirements to avoid labour-related issues. Subsequently, basic services, such as transportation and warehousing, were outsourced to 3PLs. In recent years, domestic and foreign 3PLs began integrated services as well as value-added services.

The logistics market in India is huge but unexploited. Unlike China, the development in India’s logistics market is relatively slow and still in the infancy stage. However, with the entry of several foreign 3PLs into the market, domestic 3PLs realise the importance of supply chain management and are now trying to provide integrated logistics services to remain competitive. According to a survey on the practices of the logistics industry in India, warehouse, inbound and outbound transportation, customs clearing and forwarding are the most frequently outsourced activities. Activities such as packaging, fleet management and consolidation are growing in popularity. Also more manufacturers are planning to use 3PL services. As such, we anticipate that the logistics outsourcing market and the 3PL will continue to grow.

This then suggests some opportunities for local and foreign 3PLs. A list of some of these:-

- Research & Development of IT-enabled logistics. India is a globally acknowledged IT powerhouse. This strength must be exploited by Indian companies to develop specific capabilities of IT-enabled logistics, such as the development of logistics planning and co-ordination systems. With the increasing trend towards 3PL services, these capabilities will be highly valued.
- Agriculture logistics. Although the Indian economy is driven by the agricultural sector, less attention has been paid to logistics in this sector. Moreover, since the break basket are quite distant from the urban consumer base, there are opportunities for 3PLs to focus on the inefficiencies in the agricultural logistics services and coordinate the movement of food products across the country.
- Logistics for large infrastructure projects. Economic development in India has led to several large infrastructure projects, such as the construction of airports, seaports, industrial parks and national highways. Previously, such projects

have always run into budget overruns as well as delays. Through proper logistics management and coordination of various activities, these overruns can be reined.

- **Cold SCM.** There is a severe shortage of reefer warehouses and reefer transport in India. With very few Cold SCM operators and large number of MNC's requiring these services, there is ample scope in this field.

Despite these opportunities, the Indian logistics industry is still considered to be relatively underdeveloped. Some **challenges** hindering the growth of logistics industry and 3PL services in India are:-

- **Poor infrastructure and transport vehicles.** Poor infrastructure and transport vehicles are a major hindrance. Although freight movement in India is increasing at 10 per cent a year, the infrastructure capacity is not being augmented, or better managed to meet the growing demand. As a result, performance declines and costs rise. In some cases, capacity is inadequate and even the available capacity is in dire need of maintenance.
- **Complex Tax laws.** The complex tax laws on the implementation of VAT that vary across the states are another major concern for 3PLs. In an ideal situation, a uniform VAT across states will essentially enable consolidation of warehousing which in return results in far greater efficiencies. However, given that there is still no consensus on VAT, companies are holding back investments in logistics. Another tax issue that is discouraging the 3PLs in India is the service tax on warehousing. Hence it may be cost effective for a company to keep warehousing as an in-house activity, as outsourcing this activity means factoring in the service tax.
- **Complexity in international trade documentation process and lack of IT infrastructure.** Another factor contributing to inefficiency is the complexity of the international trade documentation process. While countries such as Singapore and Hong Kong have implemented automated trade systems e.g. TradeNet and Digital Trade Transportation Network to facilitate trade documentation process and custom permit applications, in India, this issue has not been resolved yet.
- **Industry readiness.** Compared with the equipment and technologies used in developed countries, those used in India are not comparable in terms of sophistication. For example, in the warehousing sector, while Automated Storage and Retrieval Systems (ASRS) and Warehouse Management Systems (WMS) are commonly used to control the movement and storage of material handling systems in the Indian Industry, leading to improper stacking and storage.
- **Lack of training and trained personnel.** There is a complete lack of training in logistics in India with no dedicated institutions for the cause. The only recruitment is by taking on graduates and training them on the job, which is a time consuming process; while the logistics industry is booming at an increasing pace. This is causing a sharp disparity between the skill required and skill available. There is a clear need for dedicated, practical, oriented

institutes churning personnel to meet and update the growing needs of industry.

Overall, the 3PL market in India is quite young, with high growth potential. While the insufficient infrastructure, bureaucracy, complex tax and lack of training may hinder the development of 3PL services in India, more Indian firms are becoming aware of the benefits of 3PL services and are outsourcing a part or whole of their logistics-related activities to these 3PLs.

Finally to give the most accurate definition of Logistics, the lyrics from the UPS advertisement is as follows....

*When it's planes in the sky for a chain of supply, that's logistics.
When the parts for the line come precisely on time, that's logistics.
A continuous link that is always in sync, that's logistics.
Carbon footprint reduced bottom line gets a boost, that's logistics.
With new ways to compete there'll be cheers on Wall Street, that's logistics.
When technology knows right where everything goes, that's logistics.
Bells will ring, ring-a-ding, ring-a-ding, ring-a-ding, that's logistics.
There will be no more stress 'cause you've called UPS, that's logistics.*

***Discussion Point 19: Cold chain logistics
The Indian Scenario
Our Suggestions***

Annexure 1

Opportunities in the Cold Chain logistics (12)

The Cold Chain Logistics

Cold chain is a logistic system that provides a series of facilities for maintaining ideal storage conditions for perishables from the point of origin to the point of consumption in the food supply chain. The chain needs to start at the farm level (e.g. harvest methods, pre-cooling) and cover up to the consumer level or at least to the retail level. A well-organized cold chain reduces spoilage, retains the quality of the harvested products and guarantees a cost efficient delivery to the consumer given adequate attention for customer service. The main feature of the chain is that if any of the links is missing or is weak, the whole system fails

The Cold chain logistics infrastructure generally consists of

- Pre-cooling facilities
- Cold Storages
- Refrigerated Carriers
- Packaging
- Warehouse and Information Management systems
- Traceability
- Financial and Insurance Institutions

The temperature controlled supply chains or cold chains are a significant proportion of the retail food market. Fast foods, ready meals and frozen products have increased market share in recent years. There are several food temperature levels to suit different types of products. Frozen, cold chill, medium chill, and exotic chill are some of the frequently nomenclatures with identified temperature ranges. The range of temperatures is dependent on the products whether it is meat or ice cream or potatoes or bananas. Failure to maintain appropriate temperature regimes throughout the product life cycle may shorten the product life or adversely affect its fitness for consumption. Cold chain management involves maintaining appropriate temperature regime when the product travels from the farm in Himachal Pradesh to the consumer in London or New York City. That is why the logistics challenge is formidable in food chains, which is cost conscious industry. There are several governmental regulations in all countries and the responsibility to maintain hygiene and standards falls on the food retailer or manufacturer. The recent developments in electronic tagging could be useful for monitoring the temperatures and also the shelf life of the product.

The Government statistics indicate that India has about 5,400 cold storage facilities with a total capacity of about 24 m.tons. Uttar Pradesh, West Bengal and Maharashtra lead the States in having the biggest numbers of cold-chain facilities. According to a FICCI study, about 30-35 per cent of the country's 60 m.tons of fruits and vegetables produced get wasted due to inadequacies in cold storage and other facilities. In value terms, food worth Rs 58,000 crore gets wasted in India, which is more than the total production of fresh fruits and vegetables in the UK. The CII has estimated that India's cold-chain

infrastructure will require at least Rs 18,000-20,000 crore investment over the next five years to meet the growing requirement of this facility, while the industry size, at the current pace, will grow from Rs 8,000-10,000 crore to Rs 40,000 crore by 2015. While fruits and vegetables are subject to seasonal production and have a year-long consumption, milk and meat have a small shelf life. In terms of transportation, there are only about 5,000 reefer trucks that move non-milk commodities across the country. One vegetable – the potato – accounts for almost 90 percent of the total volume of cold infrastructure. Guided by such statistics, an integrated cold chain seems to be the obvious answer. We have only two companies, Radhakrishna Foodlands and Snowman, dictating a small segment of the cold chain in poultry. There is no comprehensive national policy that promotes cold chain.

The Scenario Today

The cold supply chain business has obviously not lived up to its promise. Except for a few examples, India has a totally un-integrated cold supply chain. In some pockets, individual entrepreneurs have ventured into the cold storage business. Most of these are of poor technical design and do not adhere to the international standards of storing and stacking. Pharmaceutical companies in Asia and the USA are constrained by laws to use the cold chain for their supply chain; in India the companies hardly use the cold chain.

With regards to the dairy industry, there are few large organized players – despite the year long demand. In ice creams, small players have as much as 35 percent of the market share. Overall, the scene in the cold chain supply chain seems like the next big thing that never happened, a sort of broken promise.

Regulations in cold storage infrastructure allow 100 percent Foreign Direct Investment (FDI). This consists of coolers, warehouses, reefer trucks, retail locations, chillers, etc. The Union Budget of 2010-11 provided for accelerated depreciation among other benefits. Yet very little FDI or local investments have come in. Temperature zoning, air curtains, air locks, etc. are not being used effectively or at all.

1. INTRODUCTION

India is the largest producer of fruits and second largest producer of vegetables in the world. In spite of that per capita availability of fruits and vegetables is quite low because of post harvest losses, which account for about 25% to 30% of production. Besides, quality of a sizable quantity of produce also deteriorates by the time it reaches the consumer. This is mainly because of perishable nature of the produce, which requires a cold chain arrangement to maintain the quality and extend the shelf life if consumption is not meant immediately after harvest. In the absence of a cold storage and related cold chain facilities, the farmers are being forced to sell their produce immediately after harvest which results in glut situations and low price realization. It is estimated that due to lack of proper facilities of transportation and

storage, about 33% of produce, especially fruits and vegetables are wasted i.e. about 20 million tons or 200 lakh tons are wasted. During the peak harvesting season, excess produce gets over flooded and many -a-times, due to lack of storage facilities – let alone cold storage facilities- gets damaged and totally wasted, whereas an artificial scarcity gets developed during non-harvesting periods and prices soar and many times, we have to import these goods at exorbitantly high prices.

The major important fruits and vegetables grown in India are:

Fruits: Apples, Mangoes, Grapes, Oranges, Bananas, Papaya, Pomegranate, Litchi, etc.

Vegetables: Potato, Onion, Tomato, Cabbage, Cauliflower. Peas, Okra (Ladies Finger), Garlic, Ginger, Brinjal (Egg Plant), Green Chilies etc.

Other important Dry Fruits, Fruit Juices, Chemicals, Dairy Products, Ice Creams, Food items are Frozen meat, Sea foods like Shrimps, fish etc and eggs.

2. STATUS OF COLD STORAGE AND ITS POTENTIAL IN INDIA

The estimated annual production of fruits and vegetables in the country is about 130 million tonnes. This accounts for 18% of our agricultural output. Due to diverse agro climatic conditions and better availability of package of practices, the production is gradually rising. Although, there is a vast scope for increasing the production, the lack of cold storage and cold chain facilities are becoming major bottlenecks in tapping the potential. The cold storage facilities now available are mostly for a single commodity like potato, orange, apple, grapes, pomegranates, flowers, etc. which results in poor capacity utilization. Present availability of cold storage capacity is only 103.5 lakh tonnes, out of which units having about 8 lakh tonnes capacity are non functional. Although 90% of these units are made to store only potato even then it does not meet the requirement of the single crop, the production of which is about 300 lakh tonnes. Out of 3443 cold storage units setup till 1988, 2012 units were for potato, 447 units were for multipurpose use, 198 units were for fruits and vegetables and the remaining were for products like meat, fish, milk, etc. The details of the commodity wise distribution of cold storage capacity are given below.

Commodity wise distribution of cold storage capacity

Commodity	Units	Capacity (lakh tonnes)
Potato	2,012	92.82
Multipurpose	447	7.63
Fruits & Vegetables	198	1.07
Meat	23	0.09

Fish	360	0.73
Meat & Fish	30	0.15
Milk & Dairy Products	272	0.68
Others	101	0.36

Of the above 3443 cold storage units, 2975 are in private sector, 303 are in cooperative sector and the rest are in public sector.

According to the information collected by the expert committee on cold storage and storage, requirement of cold storage in the next five years may be in excess of 12 lakh tonnes. The working group of the planning commission for IX plan had assessed new cold storage capacity for fruits, vegetables and multi commodity as 15 lakh tonnes; 13 lakh tonnes in private sector, 1.5 lakh tonnes in cooperative sector and the rest 0.5 lakh tonnes in public sector. Thus, there remains a vast potential to be tapped.

3. STORAGE OF FOODS AND STORAGE CONDITIONS

Foods and many other commodities can be preserved by storage at low temperature, which retards the activities of micro organisms. Micro organisms are the spoilage agents and consist of bacteria, yeasts and molds. Low temperature does not destroy those spoilage agents as does high temperature, but greatly reduces their activities, providing a practical way of preserving perishable foods in their natural state which otherwise is not possible through heating. The low temperature necessary for preservation depends on the storage time required often referred to as short or long term storage and the type of product.

In general, there are three groups of products:

1. Foods that are alive at the time of storage, distribution and sale e.g. fruits and vegetables,
2. Foods that are no longer alive and have been processed in some form e.g. meat and fish products, and
3. Commodities that benefit from storage at controlled temperature e.g. beer, tobacco, etc.

Living foods such as fruits and vegetables have some natural protection against the activities of micro organism. The best method of preserving these items is to keep the product alive and at the same time retard the natural enzyme activity which will retard the rate of ripening or maturity.

Preservation of non-living foods is more difficult since they are susceptible to spoilage. The problem is to preserve dead tissues from decay and putrefaction. Long term storage

of meat and fish product can only be achieved by freezing and then by storing it at temperature below -15 o C. Only certain fruits and vegetables can benefit from freezing. However, for fruits and vegetables one should be very careful about the recommended storage temperature and humidity a deviation from which will have adverse effect on the stored product leading to even loss of the entire commodity.

Products such as apples, tomatoes, oranges, etc. cannot be frozen and close control of temperature is necessary for long term storage. Some product can also be benefited by storing under controlled atmosphere and modified atmosphere conditions.

Dairy products are produced from animal fats and therefore non living foodstuffs. They suffer from the oxidation and breakdown of their fats, causing rancidity. Packaging to exclude air and hence Oxygen can extend storage life of such foodstuffs. The storage requirement of some of the important commodities are as below

Desired Storage Environment of Fruits and Vegetables in the cold storage

Commodity	Temperature (o C)	Relative Humidity (%)
Apple	-1 - 3	90 - 98
Apricots	-0.5 - 0	90 - 95
Avocado	7 - 13	85 - 90
Asparagus	0 - 2	95 - 97
Beans, green	4 - 7	90 - 95
Beet root	0 - 2	95 - 97
Broccoli	0 - 2	90 - 95
Black berry	-0.5 - 0	95 - 97
Cabbage	0 - 2	90 - 95
Carrots	0 - 2	90 - 95
Cauliflower	0 - 2	90 - 95
Cherries	0.5 - 0	90 - 95
Cucumber	7 - 10	90 - 95
Brinjal	0 - 2	90 - 95
Grapes	-1 - 1	85 - 90
Lemons	4 - 15	86 - 88
Lettuce	0 - 1	95 - 98
Lime	3 - 10	85 - 90
Mango	11 - 18	85 - 90
Melon water	2 - 4	85 - 90
Orange	0 - 10	85 - 90
Peach	-1 - 1	88 - 92

Potato	1.5 - 4	90 - 94
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4. ECONOMIC SIZE OF UNIT AND LAND REQUIREMENTS:

Cold storage units can be used to store either a single commodity or multiple commodities. Depending upon the entrepreneur's financial health; it can be planned to store the produce entirely owned by him or on rental basis or in combination of the two. Financial viability of a unit depends upon the intended pattern of use and rental rate prevalent in an area. However, units entirely to be used by the owners are also considered for sanction. Considering 70:30 utilisation of the capacity for rentals and own use, a 5000 MT capacity unit is considered as.

5. Technology

A cold storage unit incorporates a refrigeration system to maintain the desired room environment for the commodities to be stored. A refrigeration system works on two principles:

1. Vapour absorption system (VAS), and
2. Vapour compression system (VCS)

VAS, although comparatively costlier, is quite economical in operation and adequately compensates the higher initial investment. Wherever possible such a system should be selected to conserve on energy and operational cost. However, it has its own limitations when temperature requirement is below 100C and many of the fruits and vegetables except seeds, mango, etc. require lower than 100C for long storage.

VCS is comparatively cheaper than VAS. There are three types of VCS systems available depending upon the cooling arrangements in the storage rooms i.e., diffuser type, bunker type and fin coil type. Diffuser type is comparatively costlier and is selected only when the storage room heights are low. The operational cost of such units are also higher. Bunker type is the cheapest and is preferred when storage room heights normally exceeds 11.5 m. Its operational cost is also low. Fin coil type, although about 5% costlier than the bunker type, is very energy efficient with low operational cost and higher space availability for storage of produce. Such system is used for units with room heights of 5.4m onwards. A comparison of electrical loads & energy savings, refrigerant requirement and space savings in all the three systems are given below.

Comparison of energy savings, refrigerant and space requirement of cooling units of a 4000 MT cold storage.

Item	Unit	Type of Vapour Compression System		
		Diffuser	Bunker	Fin coil
Installed Electrical load	hp	180	128	124
Installed Electrical load	kW	134.28	95.49	92.50
Energy saving	%	-	29	31
Refrigerant requirement	kg	1,520	2,200	380
Space requirement for cooling system	cu m	452	670	36

In a refrigeration system, refrigerants are used to pick up heat by evaporation at a lower temperature and pressure from the storage space and give up the heat by condensation at a higher temperature and pressure in a condenser. Freon used to be a common refrigerant but as it causes environmental degradation, its use is going to be banned by the year 2008. Therefore, Ammonia is being increasingly used and preferred for horticultural and plantation produce cold storage units.

Although several types of compressors and condensers are available, medium speed reciprocating compressors and atmospheric condensers are preferred because of the relatively lower cost, energy efficiency and ease in maintenance.

While selecting size of the equipment, care should be taken to assess all loads and proper provision should be made to take care of the peak demand during summer loading and aging of the equipment. Heat load factors normally considered in a cold storage design are:

1. Wall, floor and ceiling heat gains due to conduction
2. Wall and ceiling heat gains from solar radiation
3. Load due to ingress of air by frequent door openings and during fresh air charge.
4. Product load from incoming goods
5. Heat of respiration from stored product
6. Heat from workers working in the room
7. Cooler fan load
8. Light load
9. Aging of equipment
10. Miscellaneous loads, if any

Structural requirement : Although the storage space provision will vary according to the room height and technology being selected. Normally, a provision of 3.4 m³ per MT of potato is considered for finalizing the room size with the bunker type of VCS technology. For other commodities, space adjustment should be made with relation to

their bulk density as compared to potato. Proper soil testing and rack design need to be ensured. The rack system and its foundation should be strong enough to support weight of commodities. Normally, raft foundation is preferred for racks.

Large Cold Storages: Almost 95 to 98% of these use R-717 (NH₃) as refrigerant. Most of these use gravity feed flooded systems or pump-circulation methods. Only very large capacity ones with liquid pump circulation think of screw compressors. Majority of others go in for open type Reciprocating 'Kirloskar make 'KC' compressors of single stage or two stage design depending on the evaporating temperatures required. A very large proportion of these cold storages use only Kirloskar compressors although there are a small number of other indigenous manufacturers who also manufacture reciprocating compressors. Virtually, 'Kirloskar' KC Compressors are used not only in India but also in many other countries such as Bangladesh, Sri Lanka, Nepal, the Middle East and even in Australia. The smaller capacity cold storages who use halocarbons as refrigerants mostly use R-22 or in some very few cases, for imported units use HFC's like R-404a.

Insulation: All the sides of the cold storage room need to be insulated in order to maintain the required temperature inside. Various types of insulating materials are used for insulation of side walls, partition walls, floor and roof. However, the most commonly used insulation material is thermocol and sometimes Poly Urethane Fibre (PUF) panels are also used for insulation depending upon the economics of the project. Proper thickness of insulating material should be used for insulation of walls. Normally, two layers of insulating material are used for insulation. A minimum 100 mm thickness of low density thermocol need to be used for sun facing walls and roof, whereas 80 mm thickness of low density thermocol may be used for other two walls. Partition walls need to be insulated with 40 mm low density thermocol and a thickness of 80 mm high density thermocol is necessary for floors.

Utilities: Availability of soft water and dependable power supply at the site needs to be ensured. In case the power available is not dependable, provision of a Diesel Generator set should be incorporated in the project. Similarly if water at site is not soft and its hardness is within the limit for treatment, a softening plant has to be incorporated to match the capacity.

Physical and Financial Outlay

The following physical provisions with their costs are considered for a cold storage unit:

1. Land
2. Site development including leveling, fencing, road, drainage, etc.
3. Civil structures including main cold storage building, rack provisions, drying shed, machinery room, store for consumables, generator room, office, security cabin, etc.
4. Insulation of main cold store building

5. Machinery for cooling, air movement, loading, grading and weighing
6. Electric supply arrangement including installation of transformer and deposits for requisite connection
7. Standby electric supply arrangement/ DG set
8. Water supply arrangement and treatment plant, if required
9. Pollution control and waste disposal equipment
10. Miscellaneous fixed assets including office equipment and furniture
11. Preliminary and preoperative expenses
12. Contingency
13. Margin money for working capital

Wherever market is there for ice, an ice plant of the suitable size may be incorporated for better utilization of the facilities and higher income. If an ice plant is included with the cold storage, the additional investment for ice plant may also be included in the financial outlay. The average cost of a 5000 tonnes capacity cold storage is about Rs. 150 lakhs and the tentative expenditure on broad heads is given below

BROAD TECHNICAL PARAMETERS FOR A 5000 MT COLD STORAGE

Land requirement	2 acres	
Storage requirement	space 17000 cubic metre	
Technology preferred	Gravity circulation/ type/ Fin-coil	Bunker
Cold storage room height	12.2 to 18.5 m	
Avg. cost of investment	Rs. per MT	Total Cost (Rs. lakhs)
Civil cost	1400	70
Insulation cost	350	17.5
Equipment cost	1100	55
Miscellaneous cost	150	7.5
Total	3000	150
Operational cost	Rs./MT/year	

Electricity & utilities	210	
Establishment expenses	35	
Maintenance and repair	20	
Gas, Fuel and Lubricants	10	
Labour charges	15	
Insurance	20	
Total Electrical load	125 kW	

While deciding the physical provisions, care may be taken to make the unit a multi commodity and multi chamber system for better capacity utilization.

6. Opportunities for Cold SCM (Cold Chain).

The total cold chain market in India is worth Rs. 21,375 million.

Chiller Segment, which includes Fruits & Vegetables packhouses, Potato, apple contributes Rs 16050 million to the cold chain market.

It is at a threshold of exponential increase due to developments taking place in food and retail industry of India.

Potatoes: The production of Potatoes varied between 200 lakh M.tons to 300 lakh M.Tons p.a. from the year 2008. The total cold store capacity in the country was for about 103 lakh tons numbering 3443. Out of these about 2012 are for potatoes, 447 for multipurpose and 198 for fruits and vegetables and others for miscellaneous items. Considering the total cold storage capacity available and the increased production due to increase in productivity etc., there is still a wide gap between production and cold storage capacity. This results in severe losses to farmers due to inadequate storage capacity.

Onions: India is the largest producer of onions in the world. Onion is an important vegetable crop. It is available in plenty during the season and is very cheap and within reach of poorest of the poor. It is grown mainly in the states of Maharashtra, Bihar, Karnataka, Gujarat, Andhra Pradesh, Uttar Pradesh, Orissa and Madhya Pradesh. The size of the Onion crop in a year depends upon weather

conditions. It has been in the range of 40 to 60 lakh tons about 5 years ago and is now expected to be about 70 lakhs tons due to increased productivity. In some years of excessive rains / scanty rains / delayed rains the crop gets affected and results in low production or sometimes even after good production, because of lack of storage facilities it gets spoilt and then prices shoot up beyond the reach of the common consumers. The 1997-98 year showed an unprecedented hike and onions had to be imported from various countries at a very high price. Hail storm and sudden drop in soil temperature affected the root activity and bulb formation and hence acute shortage of the product. Traditionally, onions are stored by conventional methods in various parts of the country. These include hanging bunches along with top, storage in various types of godowns. Some of these are provided with ventilation from side and bottom, so that heat generated is not accumulated in the godown. The losses in weight due to shrinkage varies from 10% to 35% due to drying, 10 to 12% by decay and 8 to 12% by sprouting depending upon RH and temperature during the rainy season. The total loss varies from 30% to as high as 56% depending on the type of storage construction used. Refrigerated cold storages for onions are almost non-existent, but efforts in that direction are being seriously now given.

Mangoes: Mango is the National Fruit of India. India is the largest producer of mangoes in the world with more than 12 million tonnes of production per annum. There are a number of various varieties-easily exceeding a thousand but the highest rated of them is the popular Alphonso from Ratnagiri in Maharashtra. The share of exports is less than 0.6 % of the global trade. The scene, however, is changing for the better. There is a growing realization about India's advantage as a Mango producing country and an increasing urge to use these advantages of high Quality, tastes and varieties, to capture the global markets. It accounts for more than 50% of world production.

Apples, Grapes, Oranges etc:India is a major producer of these as well. There is a growing need to develop a complete cold chain right from harvesting to exporting of these products. A large number of pre-cooling units with required temperature and high humidity are already in use for grapes. They reduce the shrinkage and weight loss to a mere 1% or less.

Retail: Retail is India's largest industry, accounting for over 10 per cent of the country's GDP. The businesses started with traditional corner stores and have emerged to supermarkets and modern retail stores.

Increasing Awareness

About 30% of the fruits and vegetables grown in India get wasted annually due lack of awareness about proper handling and storage requirements as well as poor infrastructure, insufficient cold storage capacity, unavailability of cold storages in close proximity to farms, poor transportation infrastructure, etc. As a result only 2% of products that should be temperature controlled are handled this way today- a figure that stands in stark contrast to the 15% in China, and 85% compliance with good cold chain practices found in Europe and North America. Even for Asia Pacific region as a whole the comparative figure is about 8% based on share of refrigerated transport in the entire transport market.

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