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ANALYZING SUPPLY CHAIN CONFIGURATION OF FOOD AND DRINK RETAIL COMPANY

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ABSTRACT

The decisions in supply chain are crucial and have far reaching effects as they often requires realignment of strategies of various partners of supply chain to get synergistic gains. The external environment plays a predominant role and limitation of the organizations to control it, makes decision making risky and complicated. Supply chain configuration is complex issue and much of flexibility, adoptability and performance depend upon how it is designed. In a chain of retail outlets of food and coffee company it is extremely important to maintain lead times with in control and at the same time to ensure high flexibility in supplies as demand is fluctuating and shelf life of many items is very less. Present study attempts to analyze alternative supply chain configuration of coffee and food Company which has geographical spread all over India and few outlets abroad also. Warehouse location, use of 3 PL providers and involvement of 4PL are few crucial decision factors which are considered and a comparison of alternatives based on 17 key parameters is done taking input from the managers of the supply chain department of the case company. A brief cost analysis is also carried out to evaluate potential benefit to the organization on implementation of most suitable alternative.

Keywords: Supply chain configuration, 3PL, food and drink supply chain, 4 PL.

Introduction

A supply chain is a network that includes vendors of raw materials, plants that transforms those materials into useful products and distribution centre of those products to customers, Simchi-Levi (2000). Interest in supply chain management, both in industry and in academia has grown very rapidly over the past decade. Major forces which contributed towards this trend include firstly, complete use of potential of reducing manufacturing costs, as much as practically possible, by companies and secondly, discovering the magnitude of savings that can be achieved by planning and managing their supply chains more effectively. Another reason is phenomenal development in information and communication technology, which have been widely implemented, resulting in speedy access to information and real time decision-making.

Christopher (1993) suggested that it is the supply chains of the future that will bring true competitive advantage to the companies. Supply chain management has risen high on the corporate agenda as companies recognize the potential that it offers for creating sustainable competitive advantage in an ever more turbulent business environment. Customers' requirements are becoming ever more stringent, companies aim to be increasingly customer focused, and it is often the supply chain that is able to provide the added value that customers are looking for.

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Christopher (1993) has defined the supply chain as a network of organizations that are involved through upstream and downstream linkages in the different processes and activities that produce value in the form of products and services in the hand of ultimate customer. Food and drink supply chain has been a linear relationship involving the primary producers, or farmers, the manufacturers or processors who “fabricate” the food for table, and the retailers who gather a range of such products and sell them to consumers. The food and drink supply chain can be sub-divided into a number of sectors. Agriculture, horticulture, fisheries and aquaculture are the “primary producers”, the manufacturers who process the food into products ready for the table or further cooking, together with the packaging companies, are intermediate stages, and the wholesalers, retailers and caterers are the end stages of the supply chain. At each stage in the chain the food is passed into a new ownership and ‘value’ is added to allow for the cost of journey, and also to provide a small margin of profit. The farmers and the fishing industry being the primary producers sent the raw material after harvest, or slaughter to the manufacturers for some sort of processing. This will range from milling grain into flour, malting of grain for alcohol production, grading, trimming and packaging of vegetables, to a variety of processes ending in cooking and packaging. The processed products are then either sent directly to the retailers or to wholesalers for distribution to the smaller retailers, or in case of catering, to specialist wholesalers for onward sale to caterers. In each case the consumer is end customer.

At each stage in the food chain “value” is added, this means that the additional costs of processing, packaging and distribution, together with profits are added on. The costs of unwanted or waste products are also covered at these stages. There is a general “rule of thumb” that only 15 % of the final retail cost of any product will reflect the cost the original agricultural raw material, the balance reflecting “value added” at various stages, and representing the degree of processing that it has received, Eastham et al (2002). The retailing of food and drink is essentially a “pull” type of system where customer demand triggers the whole process of supply. It works in “Just In Time” environment and high rate of perishability of food items poses challenges and complexity for maintaining the seamless supply. The supply chain management deals with the various issues, throughout the chain, from their source to the customer, and is concerned about ensuring quality, continuity of supply, the control of costs, customer service, and the increase in profits. In essence, SCM is managing flows across departments, sites and often companies for which a high degree of management integration is needed.

3PL Defined

The logistics outsourcing is in practice for many years but it was often confined to serve a single logistics function such as transportation or warehousing. Now, the 3PL providers have consolidated their capabilities to support some other services such as inventory management and fleet management. The 3PL arrangements involve long-term commitments often with multiple function or process management, Hertz et al (2003). The outsourcing of logistics activities to logistics service provider has started gaining importance in India as more and more large scale and medium scale firms are opting for it. It is largely based on the needs of the organizations to concentrate on core competencies and minimization of the total cost, Lieb et al (1993). The outsourced activities include transportation, integrated warehousing, distribution, and information management, Rabinovich et al (1999). Third party logistics is simply the use of an outside company to perform all or part of the firm’s materials management and product distribution function. 3PL relationships are typically more complex than traditional logistics supplier relationships actually they are true strategic alliances, Simchi-Levi (2000). Development in IT and communication facilities has totally changed the operations of logistics provider and

services like e-tracking, e-linking, collection-on-delivery are become possible. Bar coding has provided unique identity to each and every pack of consignment and with the help of global positioning system and internet one can track status of one's consignment almost any time. Better highway facilities and improvement in condition of roads are other factors for the rapid growth of 3PL industry.

According to Simchi-Levi (2000), following are few benefits of employing 3PL in an organization:

- Focus on core strength: Use of 3PL provider allows a company to focus on its core competencies. With corporate resources becoming increasingly limited, it is often difficult to be an expert in every facet of business. Logistics outsourcers provide a company with the opportunity to focus on that company's particular area of expertise, leaving the logistics expertise to the logistics company.
- Provides technological flexibility: Better 3PL providers constantly update their information technology and equipments with changes in technology and technology advancements. Often individual companies do not have the time, resources, or expertise to constantly update their technology. 3PL provider can provide quicker and cost-effective solutions to the company's problems.
- Provides other flexibilities: Including flexibilities in geographical locations, service offerings, and in resource utilization and workforce size etc.
- The selection of 3PL provider is multi-attribute decision involving many parameters, which are context specific.

4 PL Defined

In 1996, Accenture first coined the term 4PL (Fourth Party Logistics Provider) and defined it as a 'Supply chain integrator that assembles and manages the resources, capabilities, and technology of its own organization with those of complementary service providers to deliver a comprehensive supply chain solution'. A lot of emphasis was placed on the 4PL provider being a single point of contact for the shipper, whilst becoming an integrated part of their business to the point of representing their Logistics department.

This is why Frost & Sullivan believes that 4PLs have to be extremely flexible in coming forward to meet their customers' requirements as it is the scope of the engagement with them which will determine how the two parties will work together. The scope of the 4PL deal will also be the result of the respective capabilities of suppliers and shippers.

In general, the 4PL concept very much focuses on working together with client on transformation efficiencies, thus redesigning not only the supply chain but sometimes also the overall business process and internal organization.

In conclusion, Frost & Sullivan believes that the Logistics Industry in Europe is being too cautious in its forecasts for the 4PL market. Some people still claim that this is a very good theoretical concept, which is just not feasible in practical terms. But the reality is that similarly to the 3PL market, which has grown despite negative forecasts, the 4PL market will take off. A number of companies are already offering these types of services and an equal number are considering them as business options. As this concept becomes more of a market reality, companies will just not want-and will not be able to afford- to miss out on it.

ABC Coffee Company: An Introduction

ABC coffee company limited, south Asia's largest retailer of fine specialty coffees, was established in Feb.2000 to recreate the ambience and experience of the typical Italian neighborhood Espresso Bars. ABC coffee aims to provide a comfortable place for people to relax and unwind over a cup of coffee.

ABC coffee company was established by Turner Morrison group as specialty coffee retailer offering fine espresso based beverages. It places strong emphasis on the quality of coffee beans and the process of preparing, rich aromatic coffee. This 100% Arabica coffee is sourced from Tata coffee's plantations in Karnataka, India. The Tata coffee company is in strategic alliance with ABC with 34.3 % stakes in the company. TCL is currently exclusive supplier of coffee blends to ABC for its entire range of offerings. This alliance has given TCL access to the value added market through ABC's expanding consumer base while ABC is benefited by access to TCL's technical and blend experience on specialty coffee. The other coffee retailers in India are Café Coffee Days and Qwikey. Café coffee days has around 145 outlets with annual turn over around Rs. 200 crores.

Following points are highlighted to get first hand introduction of ABC coffee company.

- In all there are 130 outlets and corners in India and abroad.
- Expected annual turnover of Rs. 60 crores, an increase of 25 % over last year.
- Average footfalls of 1.2 millions a month.
- Wholly owned outlets in India and franchise model for Lanka and Dubai outlets.
- It has tie-ups with brands such as Planet M, Crossword and Taj hotels to open espresso corners in their premises.
- With ABN AMRO, ABC has launched a unique concept called "Bancafe"- A café in a bank.
- Concentrating on core competence of specialty coffee and hence outsourcing food items, which are available at stores as fusion food with coffee.
- Numerous varieties of hot and cold beverages like coffee, tea, soft drinks etc and food items of more than 30 varieties.
- Around 500 employees with emphasis on specialists and professionals.
- Expansion plan in south Asian countries like China, Malaysia, Singapore, Thailand, Hong Kong, and UAE.
- Presently Turner Morrison has sold it's stocks to Sterling group which now commands 60% stake, Tata has 34.4 % and remaining are with employees.
- ABC is in top 15 coffee companies in the world.
- ABC plans to be second largest player in retail coffee outlets after Starbucks of USA with more than 6000 outlets.
- ABC has joint venture arrangement with JEWELX Trading Ltd. of Sri Lanka and has set up ABC coffee Lanka Pvt. Ltd.
- International sales account for almost 10% of ABC's business at present.

Supply Chain of ABC

Supply chain operations of ABC are of paramount importance as geographical differences and distances among various retail outlets are very high. India, with its diversity and cultural

Analyzing Supply Chain Configuration of Food and Drink Retail Company

differences, is not comparable to any other country of the world. Here every few hundred kilometers, there is change in language, traditions, habits, taste and behavioural patterns. ABC has its outlets in all major cities of India like Delhi, Mumbai, Kolkata, Chennai, Bangalore, Hyderabad, Chandigarh, Goa, Pune, Ahmedabad, Lucknow, Kanpur, Shimla, Ludhiana, Baroda, Jaipur and Dehradun. It has its international operations at Lanka and Dubai.

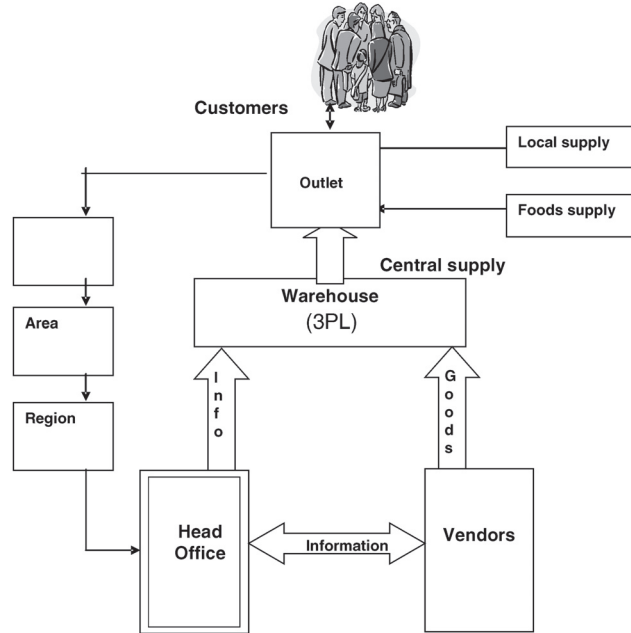


Figure 1: Supply chain of ABC Coffee Company

We can broadly classify operations of ABC's supply chain into three categories.

1. Central supply chain
2. Local supply chain.
3. Foods supply chain.

Central Supply Chain

ABC has 4 regional offices at Delhi, Mumbai, Bangalore and Kolkata. There is a centralized supply chain for dry items, which have sufficient shelf life. ABC head office at Delhi manages supply of 134 items comprising of raw materials, paper and packing items, cleaning material, crockery/cutlery, stationery and uniform, merchandising items etc. However there are few vendors who have the capability of supplying directly to the regional centers and an understanding to affect this has been evolved, still the bulk of material movement occurs from Delhi. The vendors for these materials are mostly located around Delhi and there are more than 100 vendors presently.

Company has 3PL arrangement for all its logistics needs including warehousing, record keeping, consolidating, transporting and distributing various items of centralized supply chain. For this purpose 1-year contract has been signed with Safexpress Pvt. Ltd. Safexpress is among the topmost 3PL providers in the country with Rs. 300 crore turnover and a fleet of

2500 dedicated vehicles. The Safex also controls the distribution to various outlets from warehouse. The various details of this supply chain are discussed under sub heading of “mapping of current procedure”.

Local Supply Chain

Perishable items like milk, cream, ice cream, ice cubes and other milk-based products are sourced locally and each city has its own supplier base. In case of more than one outlet in a city, all are sourcing from same vendors to get economies of means.

Food Supply Chain

To focus on core competence of providing specialty coffee, ABC has no kitchen in its outlets. All eatables like sandwiches, tikka, pasta, rolls, desserts and ice creams etc. are sourced from outside. For this purpose local suppliers are identified and contracts are signed. For example in case of Delhi, Care caterers and Taj Tacs are supplying sandwiches, fusion meals and desserts, snacks respectively. A cold supply chain with temperature ranging between 4 and 6 degree centigrade is maintained for daily supply of these items, which have shelf life of 24-36 hours. In case of few outlets, which run all around the clock, there is second supply of food items in the evening. The outlets pass on the daily sales data to Head Office electronically using e-mail.

The ABC coffee company has two strategic decisions to make which are crucial for it's supply chain policy. One is related to basic configuration of the supply chain and other is related to selection of appropriate 3PL provider. Given the size of the company and geographical spread of operation, managing all it's logistics requirements on its own is neither feasible nor economical. Use of 3PL provider is inevitable but what all functions are to be outsourced is prime concern. The company is sourcing around 134 items from more than 100 vendors and after consolidation and mixing of inventory at the warehouse it is distributing them to it's 130 outlets through 4 regional warehouses located at Delhi, Mumbai, Bangalore and Calcutta. Presently ABC coffee company has employed 3PL policy and the 3PL provider of the company looks after warehousing, sorting, picking, packing, and transportation functions. The first problem is related to selection of the appropriate procurement and distribution model, which will result in minimum cost, least lead-time, greater flexibility and higher service levels. The limited storage space at outlets and uncertainty of demand puts pressure to supply in small quantity and with shorter lead times. Safety regulations related to food items are stringent and demand high standards of hygiene and preservation. However it is not possible to achieve these goals simultaneously as they may be contradictory to each other.

Central Supply Chain Configuration

Presently Company is using hub and spoke type distribution system for all its requirements and in this system the 3PL provider is responsible for warehousing and distribution function. Warehouse is essentially an inbound consolidation warehouse where small lot inbound goods are collected from many vendors at a central point and then according to orders from outlets, picking and consolidation is done. Here the bulk load shipment is done to other cities and intra-city shipment is done in small vehicles to achieve economy. The purchasing function is under control of supply chain department of ABC Coffee Company and all suppliers directly supply to the warehouse. However there are suppliers who have capability to supply to regional warehouses directly and this has been encouraged as it results in avoidance of duplication of material handling.

In order to optimize on above mentioned goals the company is looking forward to various

alternatives for its supply chain configuration.

Alternatives

Following three alternatives are feasible and require comparative analysis.

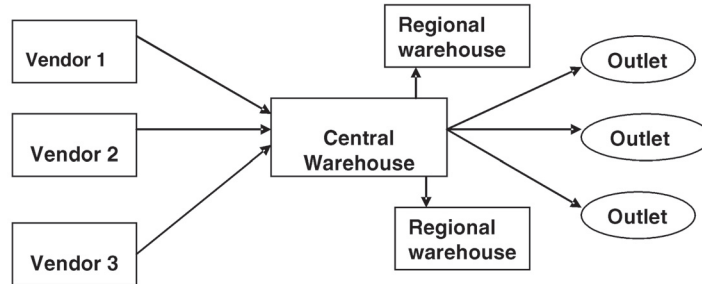


Figure 2: Typical Hub and Spoke warehousing and distribution system

ALT1: 3PL provider with warehousing facility

This is existing system with 1-year contract with 3PL provider agency, which is further extendable. There is a central warehouse located at Delhi, which is hub centre for all retail outlets in north region. For western region there is hub warehouse at Mumbai and for eastern and southern region there are transit warehouses at Calcutta and Bangalore. All these warehouses are owned by 3PL provider but used exclusively for ABC Coffee Company. Apart from these, there are company owned capital warehouses at Delhi and Mumbai storing machines, equipments, furniture and other fitments. In present system few problems were observed over a period of time like communication gap, incompatibility of IT system, primitive warehousing facilities, lesser control over the processes and high cost. However this has certain benefits such as dedicated warehouse on rent thus less capital investment, no legal complications, less manpower on pay roll of company, less botheration, better coordination among different functions. Figure 3 shows the details of this system

ALT 2: Own warehousing with 3PL for distribution

In this a company owned central warehouse is proposed which will be responsible for inbound logistics from different vendors, storing, consolidation, picking, packing etc. and the distribution to regional warehouses and with in the city outlets will be done by 3PL provider with dedicated fleet of vehicles. In place of regional warehouse at Mumbai a small transit warehouse for deconsolidation and outlet wise repacking will be located and similarly a transit warehouse at Bangalore will cater to same requirement for the southern region. For east there will be direct supply from central warehouse as there are few outlets compared to other region. The expected benefits may range from increased control, lower inventory holding, lower cost and manpower role consolidation. However there will be certain bottlenecks like opposition from present 3PL provider, long change over time, high initial investment, resistance to change etc. It may result in to requirement of additional manpower. The proposed model is shown in Figure 4

ALT 3: Using 3PL with 4PL

In this proposed system the complete purchasing and procurement function is outsourced to 4PL provider who is responsible for sourcing desired quantity and quality of the items from different vendor base and supplies it to the warehouse of the 3PL provider for warehousing, storing, picking, packing and transportation as per the demand schedule. This system will

entail the complete responsibility of selection, development and rating of vendors to 4PL provider along with inspection, quality assurance, paper work, packing and transportation to warehouse of 3PL provider. This is the most advanced system and not many examples are seen in Indian market. The product development department of the ABC coffee company will mention the specifications of ingredients and desired quantity and demand schedule will be furnished by the supply chain department. Alternatively a single agency can provide both 3PL and 4PL requirements to reduce the cost by avoiding profit making at additional echelon. This system will offer lot of freedom to concentrate on core competency and operation and marketing of the business. The role of the supply chain department will be mainly of controlling and monitoring. Since no feasibility study is undertaken to assess the cost benefit of such a model it is difficult to give figurative details of model but a comparative analysis to figure out the expected benefits and bottlenecks can be done. In fact there is no such agency is earmarked which can take the responsibility of 4PL of a food and drink supply chain. However this assessment will be useful in time to come with expected growth of company to say 500 to 1000 outlets. Figure 5 shows the proposed model.

The Schematic diagrams of these alternatives are given in appendix A.

Comparison of Alternatives

A comparison of three alternatives is done on various parameters.

Table 1: Comparison of alternatives of supply chain configuration

S. No.	Attribute	ALT 1	ALT 2	ALT 3
1	Ease of implementation	Easy	Moderate	Difficult
2	Cost of implementation	Nil	Medium	High
3	Cost of operation	High	Low	High
4	Control over process	Medium	High	Low
5	Flexibility	Medium	High	Low
6	Adoptability in case of expansion	Medium	Low	High
7	Suitability for International operation	Medium	Low	High
8	Risk involved	Medium	Low	High
9	Inventory holding	Medium	High	Low
10	Manpower on company's payroll	Medium	High	Low
11	IT requirements	Medium	High	Low
12	Dependability	Medium	Low	High
13	Visibility of inventory	Medium	High	Low
14	Leakage of business secrets	Medium	Low	High
15	Legal complications	Medium	Low	High
16	Role of supply chain department	Controlling. Managing	Complete management	Monitoring
17	Ease of new product development	Easy	Easy	Difficult

Discussion

For alternative 1 and 2 cost comparison analysis is done. For analysis average material

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movement of last 6 months is taken. The intra city and intercity movement of dry stock is 44385 Kg. and 35106 Kg. with current cost of Rs.112440 and Rs.341227 respectively. The total cost is Rs. 453667. For food items total cost of logistics is Rs. 1123090 for all the regions put together. For proposed model that is alternative number 2 these costs are estimated to be Rs. 432898 and Rs. 1010781 respectively resulting in net savings of 5% and 10% in dry and food stock movement. There is significant savings of 38 % in the corporate cost, which comprises of manpower, communication and courier costs. The details of the study are not given here on request from the company. In alternative 2, as the central warehouse is directly responsible for supplies to outlets at all for region supply chain department can exercise better flexibility in terms of consolidation, inventory levels, picking and packing. Better control over the warehouse activities due to company owned warehouse will lead to quick decision making, better coordination , better understanding of the problem areas and better recourse utilization all adding towards greater flexibility. This will make installation of suitable and uniform IT platform all across the organization possible and better visibility with improved communication will lead to greater flexibility in terms of quantity and lead time. From management point of view this arrangement may require additional manpower on company's payroll but will ensure better control, coordination and cooperation, communication and cost effectiveness in totality.

Conclusion

The present status of the company is close to alternative 1 and with present size and nature of operation the alternative 2 looks to be more promising but it will increase the responsibility of the supply chain department and probably an internal resistance may have to be overcome. There will be minimum two to three months implementation period and initial investment will be high. A detailed feasibility study may be undertaken to look in to the finer aspects of this alternative and involvement of top management is desired before actually implementing this strategic decision. Looking at the comparison table it is evident that alternative three is good option only when there is substantial increase in the volumes of purchase and large numbers of outlets are opened. We can say that this may be good option for the future and with the expansion of company within the country and out side the country this may be adopted. The time involved in growing to proposed level of operation will also give desired maturity to the concept of 4PL in Indian context.

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APPENDIX "A"

ALT 1: 3PL provider with warehousing facility

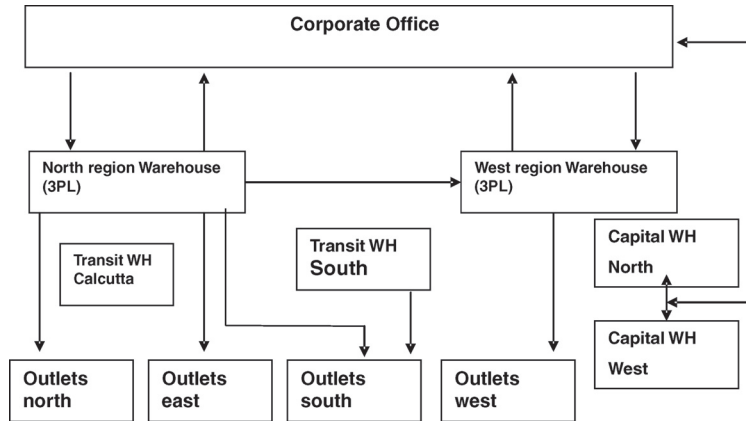


Figure 3: Existing system of distribution

ALT 2: Own warehousing with 3PL for distribution

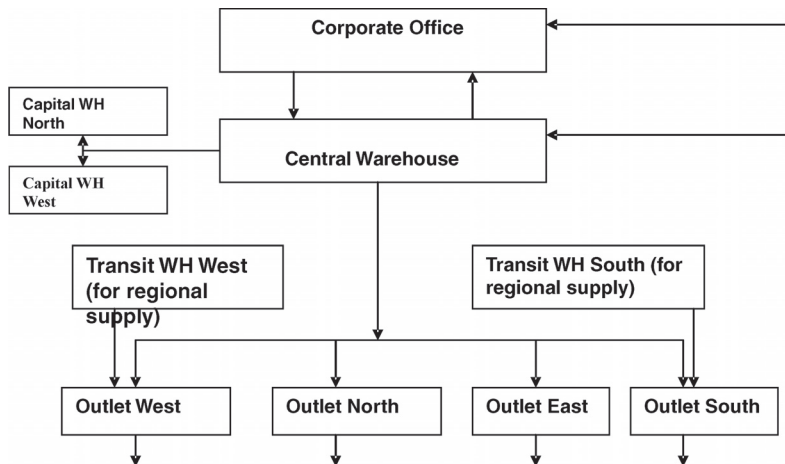


Figure 4: Proposed model with company owned central warehouse

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ALT 3: Using 3PL with 4PL

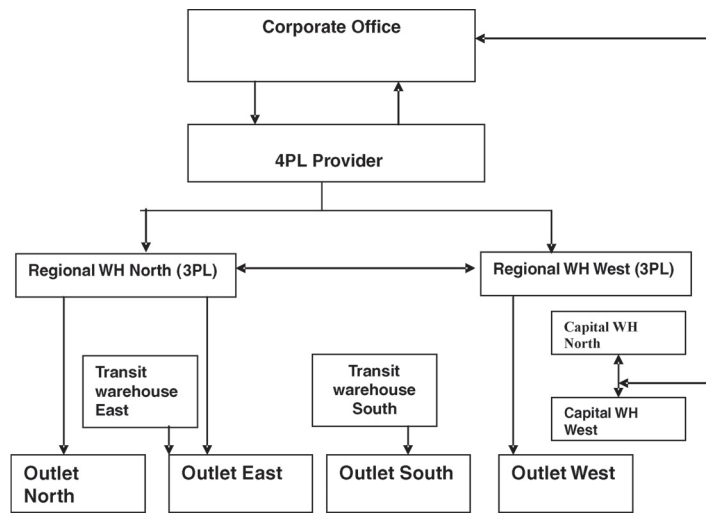


Figure 5: Proposed model with use of 3PL and 4PL providers