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STUDENT NAME

SOUMYA BRATA KAR

REGD. NO.- 2006258198
MBA 3RD SEMESTER
BIITM, BBSR

FACULTY GUIDE NAME

DR. GOBINDA CHANDRA PANDA

A PROJECT REPORT ON

"A STUDY ON SUPPLY CHAIN MANAGEMENT OF FLIPKART"

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SUBMITTED BY

SOUMYA BRATA KAR

BPUT REGD. NO- 2006258198

UNDER THE GUIDANCE OF

PROF. DR. GOBINDA CHANDRA PANDA

PROF. (OPERATION) BIITM, BBSR

BIJU PATNAIK INSTITUTE OF IT & MANAGEMENT STUDIES

(Recognized by AICTE, New Delhi & Affiliated to BPUT, Rourkela, Odisha)

BHUBANESWAR, ODISHA

CERTIFICATE

Flipkart Big Box Haringhata (RDC)

NH12, Gayeshpur, Ayespur, West Bengal- 741249, India

Main Office- Devarabeesanahalli, Bellandur Buildings Alyssa, Begonia & Clove Embassy Tech Village, Outer Ring Rd, Bengaluru, Karnataka- 560103, India

DECLARATION

I hereby declare that the project work titled **"A STUDY ON SUPPLY CHAIN MANAGEMENT OF FLIPKART"**, submitted to BIJU PATNAIK INSTITUTE OF IT & MANAGEMENT STUDIES (BIITM), is a record of an original work done by me under the guidance of Asst. Prof. Dr. Gobinda Chandra Panda, Operation Department, BIITM, BBSR and this project work is submitted in the partial fulfillment of the requirements for the award of the degree of Master of Business Administration (MBA).

The results embodied in this report have not been submitted to any other University or Institute for the award of any degree.

Place- Bhubaneswar

Date-

Name- **Soumya Brata Kar**

Regd. No- **2006258198**

BIJU PATNAIK INSTITUTE OF IT & MANAGEMENT STUDIES (BIITM)

Patia, Bhubaneswar-751024, Odisha

E-mail:- info@biitm.ac.in

INTERNAL GUIDE CERTIFICATE

This is to certify that the project report entitled **"A STUDY ON SUPPLY CHAIN MANAGEMENT OF FLIPKART"**, has been prepared by Soumya Brata Kar under my supervision and guidance for the fulfillment of the requirements for the award of the degree of Master of Business Administration (MBA).

His project work is Satisfactory.

(Signature)

Date-

Dr. Gobinda Chandra Panda

Place- Bhubaneswar

Asst. Prof. Operation Department

BIITM, BBSR

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Date-
Place- Bhubaneswar

SOUMYA BRATA KAR
Regd. No.- 2006258198

SUMMARY

The concept of e-commerce is downloading at a fairly rapid pace in the psyche of the Indian consumer. In the metros, shortage of time is a big driver for online shopping. On the other hand, accessibility to a variety of products makes audiences from smaller towns and cities opt for the online route. Major retailers face challenges in stocking their stores adequately. Often, customers are unable to purchase items of their choice, thus prompting them to resort to e-retailers.

Flipkart has accorded a lot of importance in trust building exercise that is why it has a strong Customer Support Team which helps the customers with the website guidance and resolving issues.

Flipkart uses its in-house logistics (FKL) as well as third party logistics (3PL) services as the logistics is one of the most important for a success of any ecommerce venture. Along with the logistics, reverse logistics of Flipkart is also well developed with a 30-day return policy and flipkart bearing courier charges for returned products.

Flipkart when it started employed the consignment model of procurement as it was the most risk free way to operate but then they changed to Inventory model to ensure superior delivery times. But with foreign direct investment (FDI) favoring the marketplace model in April 2013, Flipkart changed its business model to marketplace model.

WS Retail a pet project of Flipkart now handles the inventory and warehouse management. Flipkart has continued to fare very well in terms of the delivery time because of their developed supply chain management and dedicated customer support team to ensure customer delight. This causes them to build a lot of slack into their existing systems causing higher costs at several points in the supply chain. How they address this challenge is what will determine their future success.

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Introduction

INTRODUCTION

Things are easier said than done! To realize our dreams and that also in such a grand manner is really a tough task. The founders of Flipkart have probably conquered their dreams with the amazing success of Flipkart. Flipkart is something which has really opened up the Indian e-commerce market and that also in a big way.

Fig. Sachin Bansal & Binny Bansal

Flipkart was co-founded by Sachin Bansal and Binny Bansal in Oct 2007. Both are graduates from IIT-Delhi and have prior work experience in Amazon.com They both were solid coders and wanted to open a portal that compared different e-commerce websites, but there were hardly any such sites in India and they decided to give birth to their own e-commerce venture - www.Flipkart.com

Thus was born Flipkart in Oct 2007 with an initial investment of 4 lacs (co-founders savings). It was never going to be easy since India has bad past experiences with e-commerce trading. It was not an easy segment to break into, people were very particular in paying money for something which they had not seen and received. The trust was missing in the Indian customers. So what Flipkart had to do was to instill trust and faith in their customers. And they did exactly the same, will discuss more on how they did so later in the post.

Flipkart began with selling books, since books are easy to procure, target market which reads books is in abundance, books provide more margin, are easy to pack and deliver, do not get damaged in transit and most importantly books are not very expensive, so the amount of money a customer has to spend to try out one's service for one time is very minimal. Flipkart sold only books for the first two years.

Flipkart started with the consignment model (procurement based on demand) i.e. they had ties with 2 distributors in Bangalore, whenever a customer ordered a book, they used to personally procure the book from the dealer, pack the book in their office and then courier the same.

In the initial months the founder's personal cell numbers used to be the customer support numbers. So, in the start they tried their best to provide good service, focus on the website - easy to browse and order and hassle-free, and strove hard to resolve any customer issues. Since there were not any established players in the market, this allowed them a lot of space to grow, and they did in fact grew very rapidly.

Flipkart had a revenue of 4 crores in FY 2008 - 2009, 20 crores in FY 2009 - 2010, 75 crores in FY 2010 - 2011, and the revenue for FY 2011 - 2012 which ends on 31 Mar 2012 is expected to be 500 crores. This is indeed a massive growth. The company targets revenues of 5000 crores by 2015.

The company started from 2 employees and now has around 4500 employees. Flipkart started with consignment model as discussed above, since most of the customer issues like delivery delays etc. result from procurement model, the company started opening its own warehouses as it started getting more investments.

The company opened its first warehouse in Bangalore and later on opened warehouses in Delhi, Kolkata and Mumbai. Today the company works with more than 500 suppliers. As on date more than 80% orders of Flipkart are handled via warehouses which help in quick and efficient service.

A humble beginning from books, Flipkart now has a gamut of products ranging from: Cell phones, laptops, computers, cameras, games, music, audio players, TV's, healthcare products, washing machines etc. etc. Still, Flipkart derives around 50% of its revenue from selling books online. Flipkart is the Indian market leader in selling books both offline and online, it enjoys an online share of around 80%. The electronic items have a large number of players like

Naaptol, Letsbuy, Indiaplaza, Tradus, Infibeam, Yebhi etc. The electronic market share is distributed among them in different unknown proportions.

India has around 13.5 crore internet users today where as the number of homes with Cable and Satellite (C&S) television is 10.5 crore. The expected internet users will reach a figure of 30 crores by 2014 and C&S homes are expected to be 14 crores by 2014.

Thus India has a tremendous internet growth and with the customers getting accustomed to e-commerce, the future of e-commerce sector is definitely rosy. An approximated 25 lac people have transacted online this year; the number is all set to increase with time.

Also to mention most of the Flipkart customers use internet from PC's/Laptops to order goods. The use of mobile internet is very less at the moment, but with the advent of smart phones the use of mobile internet for e-commerce transactions will soar with time. India has 8 crore mobile net users at the moment, the number is expected to swell to 22.5 crore by 2014.

METHODOLOGY

We started with secondary research of the internet retail industry and the major players through news articles, industry reports and databases. This helped us to get an overall idea of the working of the industry and understand it’s dynamics. Then we went on to do extensive secondary research on Flipkart, its business model and all elements of its supply chain. Then we did primary research in the form of interviews of Mr. Shini Patel, and Mr. Pavan Raghuveer both Managers-Operations and in-charge of SCM and Delivery. With their inputs on procurement, logistics, order processing, supplier management and customer support and secondary research we formulated a draft. However, we identified certain gaps and interviewed the two gentlemen again along with Ex-Flipkart employee Ms. Shuchi Shukla and our batch mates who interned at Flipkart. With the second round of inputs, we were able to understand and analyze Flipkart's supply chain.

RESEARCH OBJECTIVES

- To learn Inbound and Outbound Process
- To gain different skills in Supply Chain Management
- To maximize the profit during peak times.

Chapter- 2

Company Structure

COMPANY STRUCTURE

The entire organizational structure of Flipkart is organized in three broad teams as depicted below.

Product and Technology	Business Development	Operations
Website Management **ERP System**	**Vendor Management** **Sales Management** **Pricing Strategies**	**Procurement** **Warehouse** **Logistics** **Customer Support**

PRODUCT AND TECHNOLOGY TEAM

The product and technology team is the core strength of the company. The team is responsible for the management of the website as well as the ERP system. It has developed a state of art system in-house using open source software. Website is a backbone of any online retail shop and Flipkart's website is also managed by this team only. The team manage the entire process right from listing of item to search engine optimization.

BUSINESS DEVELOPMENT TEAM

Business development team is responsible for all the activities related to sales including vendor management to pricing and discount strategy.

OPERATIONS TEAM

Operations team deals with all the supply chain aspects of the company right from procurement and warehouse management till customer support. The team support the customers both online via telephone as well as offline via email.

CUSTOMER SUPPORT TEAM

Flipkart has a strong focus on customer service with customer delight as the top most priority. And to fulfil it the company guarantees a 24/7 full customer support and to cater this facility it has a dedicated customer support team which offers both inbound and outbound support. There are two prime responsibilities of support team:

- **Website Guidance:** The team basically provide guidance to new users of the website on how to navigate through it. It also handles order processing functions like order verification calls, payment related queries etc.

- **Resolution of Issues:** This includes intimation to customer about issues such as any delay in delivery as well as resolution of complaints both pre-purchase and post purchase.

TOTAL REVENUE

Flipkart India revenue grew 12% to Rs 34,610 cr in FY20

Walmart-owned e-commerce major Flipkart has reported a revenue of Rs 34,610 crore for the financial year 2019-20 – an increase of 12 per cent over the previous year. The company's net loss during the year, at Rs 3,150 crore, dropped 18 per cent from 2018-19, showed regulatory documents sourced from business intelligence platform Tofler.

During FY20, the company allotted total equity shares worth Rs 4,455 crore to Flipkart Private Limited Singapore and its total expenses for the financial year stood at Rs 37,760 crore.

Experts said that Flipkart's future revenues were going to improve, as the Covid-19 pandemic had accelerated a shift to e-commerce, with an increasing number of consumers shopping online at a higher frequency. Flipkart and its rival Amazon, besides others, witnessed blockbuster festive-season sales this year.

India's online festive sale in one month (during October-November) stood at $8.3 billion in gross sales, including for brands and sellers – up 65 per cent year-on-year – exceeding forecasts, according to a report by consulting firm RedSeer. The festive season this year saw 88 per cent customer growth from last year, driven mainly by about 40 million shoppers from Tier-II cities and beyond.

Flipkart's flagship festive sale Big Billion Days saw at least 40 per cent growth over last year, said people in the know. The firm achieved its sales target for the week-long event which ended last month in just three days. This year, marketplace sellers witnessed in just two days of BBD the growth level they had seen during six days last year.

Walmart International, which includes the retail giant's operations outside the US, recently reported a 1.3 per cent rise in net sales in the third quarter of 2020, led by e-commerce firm Flipkart, Canada, and Walmex (Walmart de Mexico).

Excluding the currency factor, net sales were $30.6 billion, an increase of 5 per cent. It said strong growth in net sales at Flipkart was helped by a record number of monthly active customers.

BASIC OF SUPPLY CHAIN MANAGEMENT:

- A supply chain is the alignment of firms that bring products or services to market.

- Supply Chain Management can be defined as the management of flow of products and services, which begins from the origin of products and ends at the product's consumption. It also comprises movement and storage of raw materials that are involved in work in progress, inventory and fully furnished goods.

- The main objective of supply chain management is to monitor and relate production, distribution, and shipment of products and services. This can be done by companies with a very good and tight hold over internal inventories, production, distribution, internal productions and sales.

- A supply chain consists of all stages involved, directly or indirectly, in fulfilling a customer request. The supply chain not only includes the manufacturer and suppliers, but also transporters, warehouses, retailers, and customers themselves.

- Supply chain management is the coordination of production, inventory, location, and transportation among the participants in a supply chain to achieve the best mix of responsiveness and efficiency for the market being served.

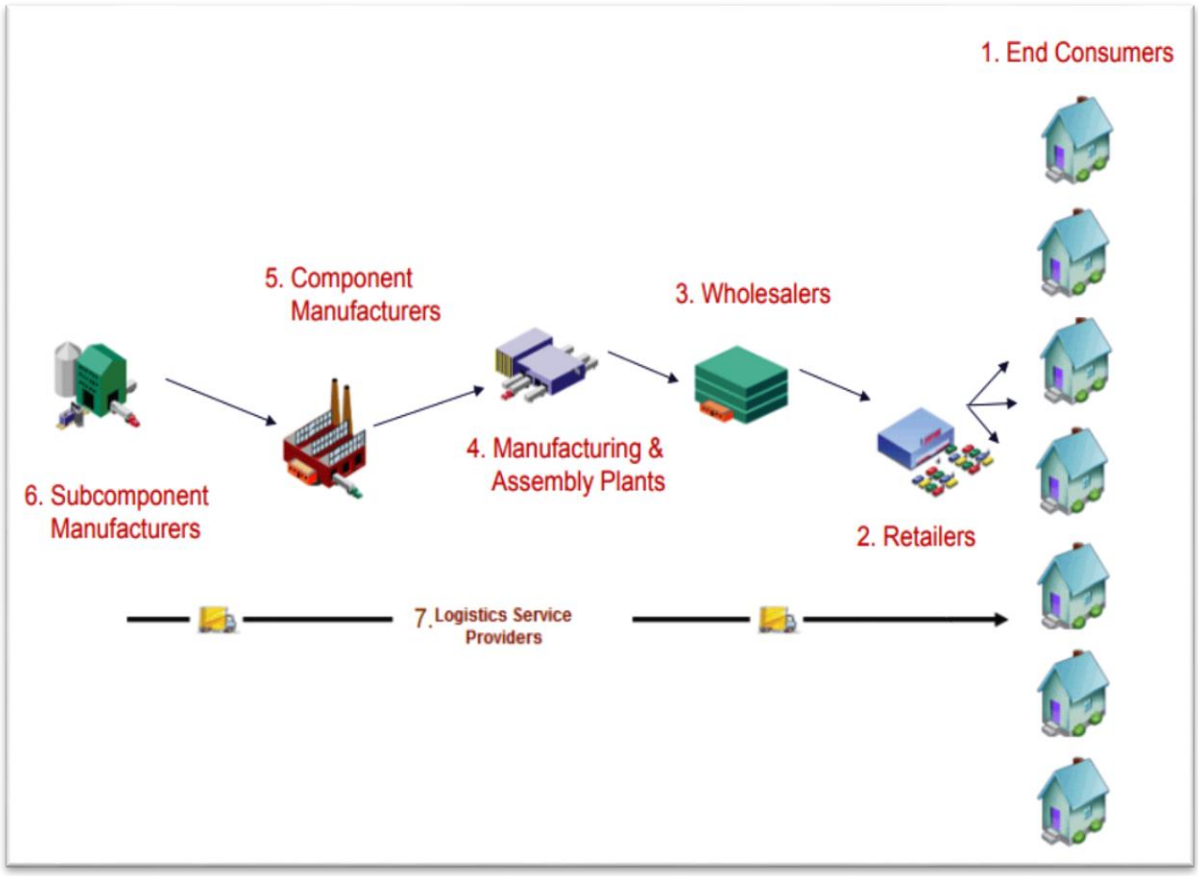


Figure: Supply Chain Management

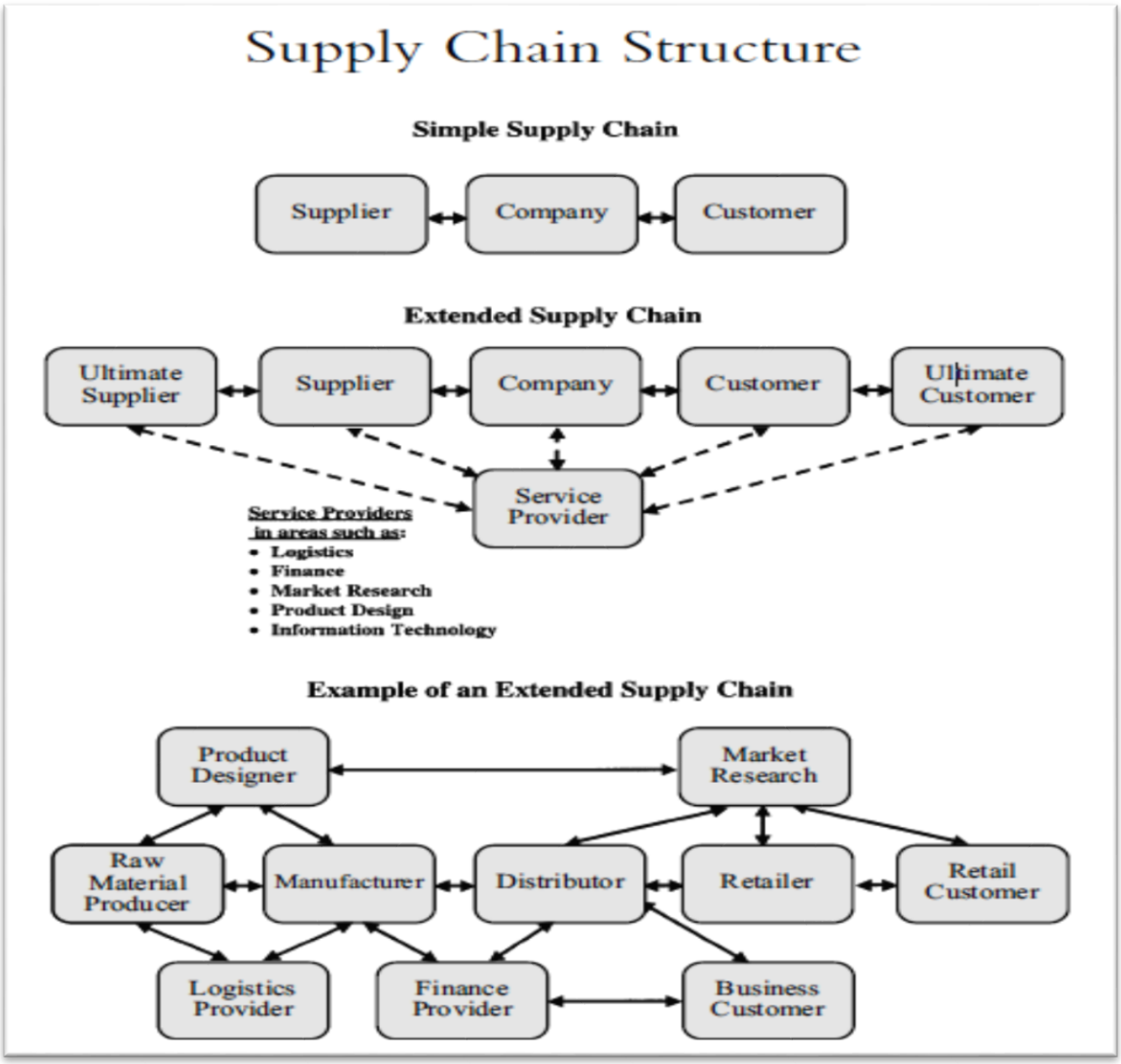
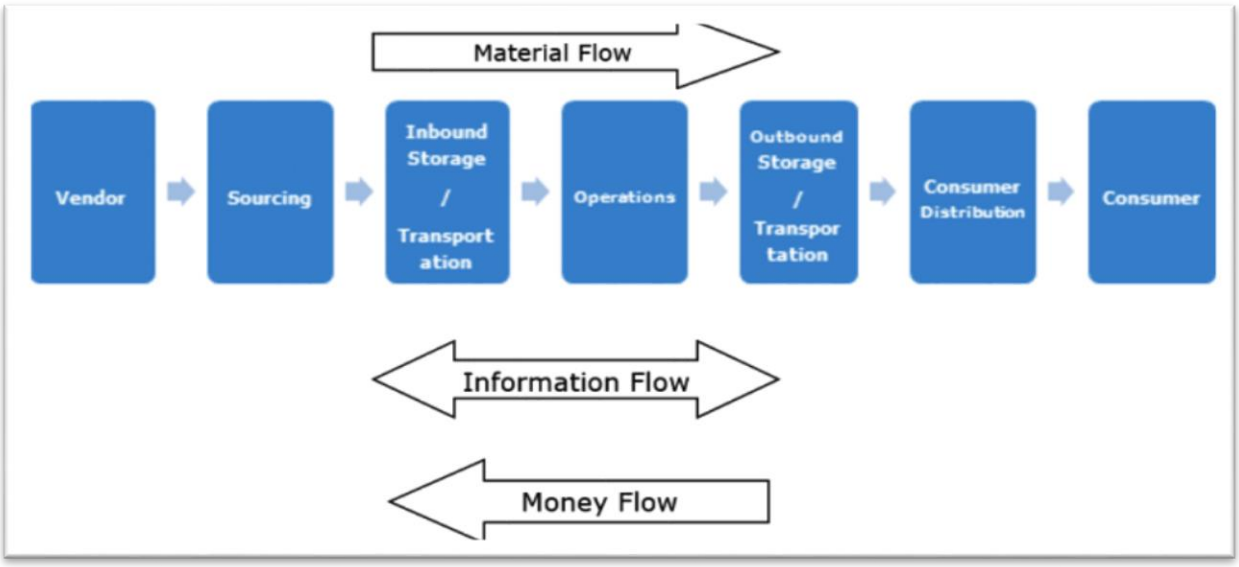


Figure: Supply Chain Structure

SUPPLY CHAIN MANAGEMENT – PROCESS FLOW:

Supply chain management can be defined as a systematic flow of materials, goods, and related information among suppliers, companies, retailers, and consumers. There are three different types of flow in supply chain management:

1) Material flow
2) Information/Data flow
3) Money flow



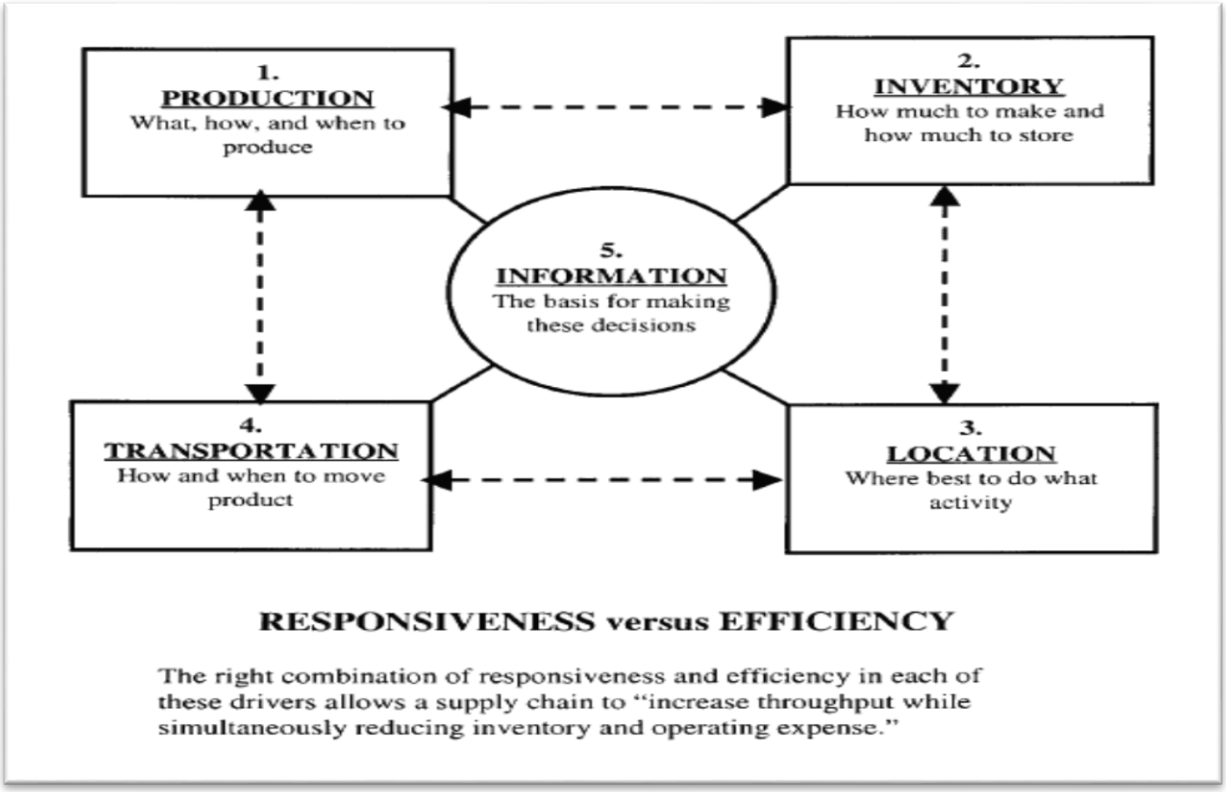


Figure: The Five Major Supply Chain Drivers

CENTRALIZED AND DECENTRALIZED SUPPLY CHAIN:

Centralize Supply Chain:

1) Centralize Supply Chain Processes are those that can be managed from a remote location, can serve multiple sites, and drive synergy by serving multiple sites.

2) They provide for less duplication of resources and provide efficiency and effectiveness by managing key processes centrally. In some cases, it can save money and bring economies of scale. Some examples of centralize supply chain processes that can be managed centrally are shown in below;

i. SIOP (Sales Inventory & Operations Planning) facilitation
ii. Forecasting
iii. Supplier replenishment planning
iv. Master schedule
v. Process design & deployment
vi. Council leadership
vii. Logistics management
viii. Item maintenance

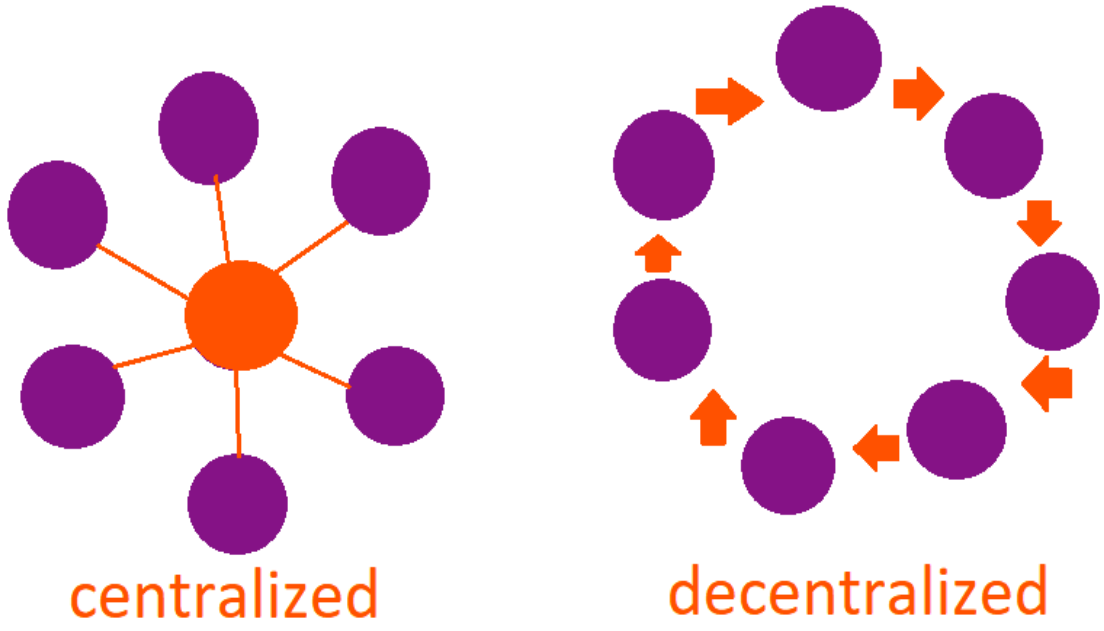


Figure: Centralized and Decentralized Supply Chain Management

Decentralize Supply Chain:

- Decentralize supply chain processes can be defined as processes that must be performed in the plant because they involve physical interaction with the material.
- There processes are the ones where the decision-making is 'localized'.
- It involves supply chain managers, planners, manufacturing teams, health and safety team and possibility trade management folks.
- Some examples of the example of decentralize supply chain processes that can be managed centrally are shown in below;

  i. Receiving/shipping
  ii. Assembly
  iii. Manufacturing
  iv. Material transaction
  v. 5**S**- visual (**S**ort-**S**et in Order-**S**hine-**S**tandardize-**S**ustain)
  vi. Plant for every part
  vii. Health & safety aspects
  viii. Audit & control Process
  ix. Trade Management

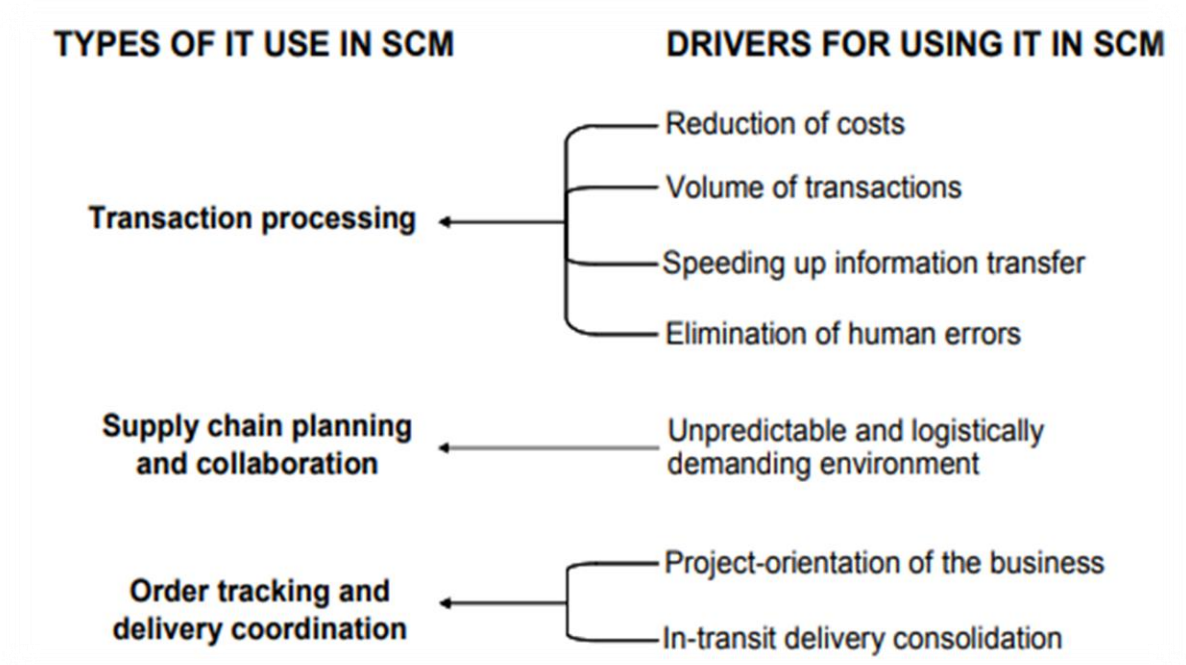
USE OF IT FOR TRACKING IN SUPPLY CHAIN:

The use of information technology (IT) is considered a prerequisite for the effective control of today's complex supply chains. The objectives of IT in SCM are:

- providing information availability and visibility;
- enabling a single point of contact for data;
- allowing decisions based on total supply chain information; and
- enabling collaboration with partners

The use of IT for SCM purposes can be divided into-

1) Transaction processing,
2) Supply chain planning and collaboration,
3) Order tracking and delivery coordination.



The first type of IT use, **transaction processing** stands for the use of IT for increasing the efficiency of repetitive information exchanges between supply chain partners. In this type of IT use the exchanged information is typically related to such tasks as order processing, billing, delivery verification, generating and sending dispatch advices, and producing order quotes.

The second type of IT use, **supply chain planning and collaboration**, represents the use of IT for sharing planning-related information such as demand forecasts and other demand information, inventory information, and production capacity information, with the intention of increasing the effectiveness of the supply chain.

Finally, the third type of IT use in SCM, **order tracking and delivery coordination**, refers to the monitoring of individual orders or shipments, which may consist of components or final products, with the aim of coordinating their delivery or conveying timely information of their location.

Information sharing between partners in the supply chain is also crucial and these integration attempts are accompanied by IT initiatives. Such IT initiatives include:

- Use of bar-coding in logistics systems
- Use of EDI (Electronic Data Interchange) to communicate between

branches

- Use of Material Requirements Planning (MRP)
- Enterprise Solutions like ERP
- Internet and Web Services for communication between partners

LOGISTICS

Logistics is one of the most important facets of any successful ecommerce venture. Flipkart ships more than 30000 items a day which makes management of the logistics a cumbersome task for the company. Furthermore, the cost of the delivery is born by the company itself making logistics a financially complex issue also. Hence in order to successfully manage logistics Flipkart uses its in-house logistics (FKL) as well as third party logistics (3PL) services.

While more than 90% of the Cash on delivery (COD shipments and about 60-70% of the overall shipments are delivered by the FKL the rest of shipments are catered by 3PL service providers. Moreover, if there are more than 100 deliveries for a particular destination the company uses FKL. In case of FKL, the shipment is first transported to Mother hub and then to delivery hub and subsequently from delivery hub the last mile delivery is done using suitable mode of transport such as two-wheelers, bicycles, or on foot.

The company has tie-ups with more than 15 courier companies like Blue Dart, First Flight etc. to deliver their products and Indian post for areas where courier do not reach. And to manage the 3PL providers efficiently the company allocates time slots to different logistics partners and they can pick up deliveries on specified time slots only.

For delivering the items the logistics service among the three is decided based on the area where the item needs to be delivered as well as product type and payment method. FKL is presently available in major tier 1 cities including metros only.

The company uses India Post only in case if the shipment location is not serviced by any of the 3PL as well as FKL primarily because of the higher delivery time. Moreover, India Post orders are of prepaid nature only. The delivery time varies between 3 days to 3 weeks depending on the location and availability of the product.

For example, imported products take about 3 weeks' time to get delivered to the customers whereas if product is available in local warehouse it gets deliver within 3 days. The mode of transportation is also dependent on the location. For example, the inter-city, trans-zone deliveries are made using air cargo whereas satellite cities and others in close proximity;

products are transported overnight by train or truck. For the local parts of the cities where the warehouses of the company exist products are delivered using two-wheelers, bicycles, or on foot depending upon the proximity of the place.

LOGISTICS MANAGEMENT:

The management process which integrates the movement of goods, services, information and capital, right from the sourcing of raw material, till it reaches its end consumer is known as Logistics Management. The objective behind this process is to provide the right product with the right quality at the right time in the right place at the right price to the ultimate customer. The logistic activities are divided into two broad categories they are:

Inbound Logistics: The activities which are concerned with procurement of material, handling, storage and transportation.

Outbound Logistics: The activities which are concerned with the collection, maintenance and distribution or delivery to the final consumer.

Apart from these, other activities are warehousing, protective packing, order fulfillment, stock control, maintaining equilibrium between demand and supply, stock management. This will result in savings in cost and time, high quality products etc.

LOGISTICS COMPONENTS:

The management of logistics can involve some or all of the following business functions, including:

- Inbound transportation
- Outbound transportation
- Fleet management
- Warehousing
- Materials handling
- Order fulfillment
- Inventory management
- Demand planning

WHY LOGISTICS IS IMPORTANT?

Although many small businesses focus on the design and production of their products and services to best meet customer needs, if those products cannot reach customers, the business will fail. That's the major role that logistics plays. But logistics also impacts other aspects of the business, too.

The more efficiently raw materials can be purchased, transported, and stored until used, the more profitable the business can be. Coordinating resources to allow for timely delivery and use of materials can make or break a company. And on the customer side, if products cannot be produced and shipped in a timely manner, customer satisfaction can decline, also negatively impacting a company's profitability and long-term viability.

Types of logistics:

1) ***Procurement logistics*–** the process of providing the enterprise with material resources, the allocation of resources in the warehouses of the enterprise, storage and delivery into production.

2) ***Industrial Logistics* –** Materials Management, while passing through its production units, moving from the primary source of raw materials to finished products.

3) ***Distribution logistics* –** a complex of interrelated functions included in the distribution of material flow between the various wholesale purchases, ie in the wholesale trade.

4) ***Transport logistics* –** management of cargo transportation.

5) ***Information logistics* –** the part of logistics, which is the link between supply, production and marketing of products and organizes the data flow, which accompany the material flow in the process of being relocate

GREEN LOGISTICS:

- Green Logistics is defined as "efforts to measure and minimize the environmental impact of logistics activities, these activities include a proactive design for disassembly".

- Green logistics is a form of logistics which is calculated to be environmentally and often socially friendly in addition to economically functional. It describes all attempts to measure and minimize the ecological impact of logistics activities. This includes all activities of the forward and reverse flows of products, information and services between the point of origin and the point of consumption. It is the aim to create a sustainable company value using a

balance of economic and environmental efficiency.

- Green logistics describes all attempts to measure and minimize the ecological impact of logistics activities. This includes all activities of the forward and reverse flows of products, information and services between the point of origin and the point of consumption. It is the aim to create a sustainable company value using a balance of economic and environmental efficiency. Green logistics has its origin in the mid-1980s and was a concept to characterize logistics systems and approaches that use advanced technology and equipment to minimize environmental damage during operations.

- Green logistics is the process of minimizing damage to the environment due to the logistics operations of an organization. Logistics includes transportation and resource intensive processes such as procurement, inventory management, warehousing, order fulfillment and distribution. It also includes processes such as reverse logistics and disposal logistics that concern reuse, recycling and waste disposal. The following are common examples of green logistics.

- ***Transport:*** Minimizing the emissions and energy consumption of transportation. For example, a telecom company that moves to electric vehicles for field service.
- ***Reuse:*** Reuse such as a process of reusing durable packaging in your supply chain.
- ***Efficiency:*** Reducing waste to improve operational efficiency. For example, an ecommerce

company that fits each order into a reasonable size of box without wasted space.

- ***Design for Logistics:*** Designing things to be easier to transport. For example, furniture that requires minor assembly but fits into an efficient standard size box.
- ***Proximity:*** Reducing transport by doing things closer to the customer. For example, local sourcing of parts.
- ***Sourcing:*** Sourcing from environmental responsible partners and implementing controls and audits to continually validate their environmental practices.
- ***Reverse Logistics:*** Reselling, refurbishing, remanufacturing, reusing and recycling items that are returned by the customer.
- ***Returns Avoidance:*** Preventing returns with techniques such as digital tools to make sure clothing fits the customer before shipping it.
- ***Quality of Life:*** Working to improve quality of life in the communities where you operate. For example, improving the safety of transport.
- ***Waste is Food:*** The principle that business processes don't release anything into the environment that couldn't be safely consumed by an organism. For example, a hydrogen powered vehicle that emits water as a waste product. Related to the idea of a circular economy.

REVERSE LOGISTICS

Figure: Concept of Reverse Logistics

Reverse Logistics is "the process of planning, implementing, and controlling the efficient, cost effective flow of raw materials, in-process inventory, finished goods and related information from the point of consumption to the point of origin for the purpose of recapturing value or proper disposal."

Product returns arise out of day-to-day sales in a business. They are a necessary evil for consumers and a bad news for producers and retailers**.** Even today, many businesses do not follow a structured product returns policy. In order to decide the right fit of policy for a business, sellers should keep in mind the type of returns – *Controllable returns* (those returns that can be avoided or controlled) and *Uncontrollable returns* (those returns that cannot be controlled in the short term).

For instance, frequent product returns of damaged goods would suggest that a company can install better packaging and delivery processes in its supply chain.

Most companies still fail to realize the benefits of reverse logistics even though it is one of the most significant aspect of the operational life-cycle. It is one of biggest operational challenges for e-commerce companies given the huge volumes and high costs associated with processing returns and the subsequent exchanges or refunds.

As per a statistic from a leading publication, the volume of returns for companies can range from 5% to as high as 50% of total shipments. Also, processing returns can be more expensive than forward or outbound shipments.

According to Jupiter research, over 40% of online shoppers don't make purchases online because of lack of clarity about returns.

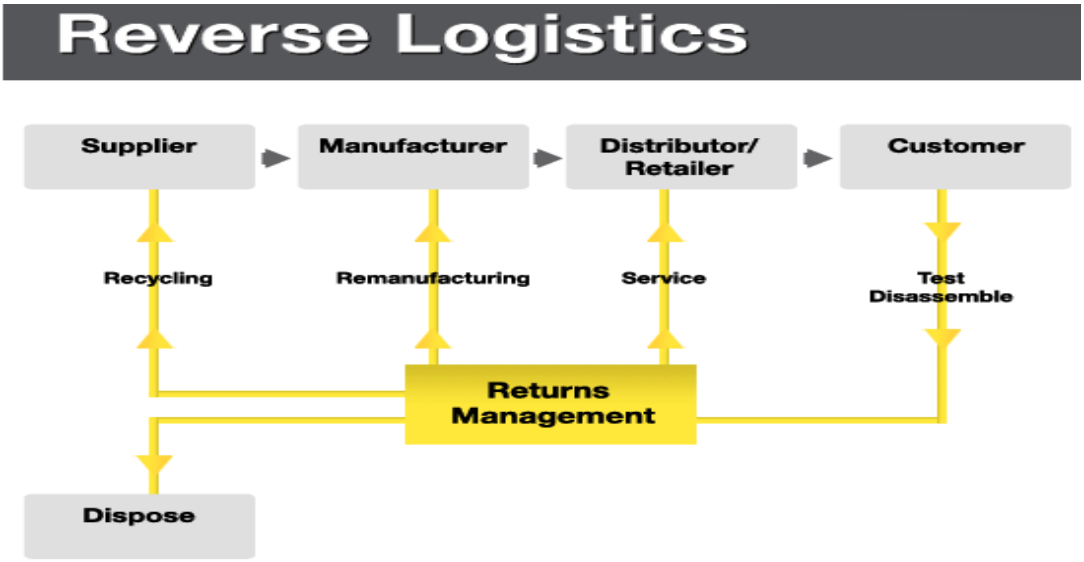


Figure: Reverse Logistics

When a customer requests return of a product, there are 3 paths this request can take:

- **Replacement:** Flipkart returns the product to the supplier and obtains a replacement that is delivered to the customer.
- **Store credit:** If the customer is not satisfied with the product, he or she is given store credit of the same amount.
- **Actual cash-back:** Given out as cash for cash-on-delivery payment or refunded for online payment.

STAGES IN THE PRODUCT RETURNS PROCESS

The product returns process occurs when a consumer has returned an item to a store or has sent it back to a catalogue or an internet company. The process typically comprises 5 steps:

1. **Receive**: The process begins by providing a returns acknowledgement to the consumer. Also many researchers argue that, right at this stage only, the company must make critical decisions about getting value from the returned item – Whether it will be refurbished/reworked or sold as scrap, whether it will be resold to consumers etc.

2. **Sort and Stage**: A company must sort the returned products effectively to ship it out to the concerned department (Reworks/Scrap etc.). It can employ labeling cartons and sub-sorting processes to identify the returned goods throughout the Product returns process.

3. **Process**: In the third stage, Items move from the sort-and-stage area to the processing station(s). At these stations, the items can be processed in order of their receipt, according to the type of product, by customer type or location, by physical size of the items or some other combination. It is also at this stage that the paperwork received along with the returned product is verified with the electronic records of the company.

4. **Analyze**: Analysis of the returned item simply means making a disposition decision to determine the fate of that item and thereby chalking out a re-marketing strategy if the item is being resold for instance.

5. **Support:** At the final stage, the focus remains at speedy processing of returns that will reduce the amount of cash tied up in returns inventory, thereby increasing the profitability of the process.

PROCUREMENT

When Flipkart started its operations, they had employed the consignment model of procurement. In this model, the retailer (in this case Flipkart) holds the inventory owned by the supplier, and buys it from the supplier only when it is sold to the end consumer. Since the channel was new and unproven, this was the most risk-free way to operate. However, they have now discontinued this now and inventory now is purchased.

Procurement of items could be for:

- **Inventory:** These items are pre-ordered based on previous sales data to stock as inventory. This category includes items with relatively low demand elasticity, fast selling items and items with relatively long shelf life.

- **Just in-time:** Items procured just-in-time are used to serve immediate outstanding orders. Items with low or unpredictable demand are typically procured on an order-to-order basis. Just-in-time procurement is also used for expensive items or products that have seen slow sales growth.

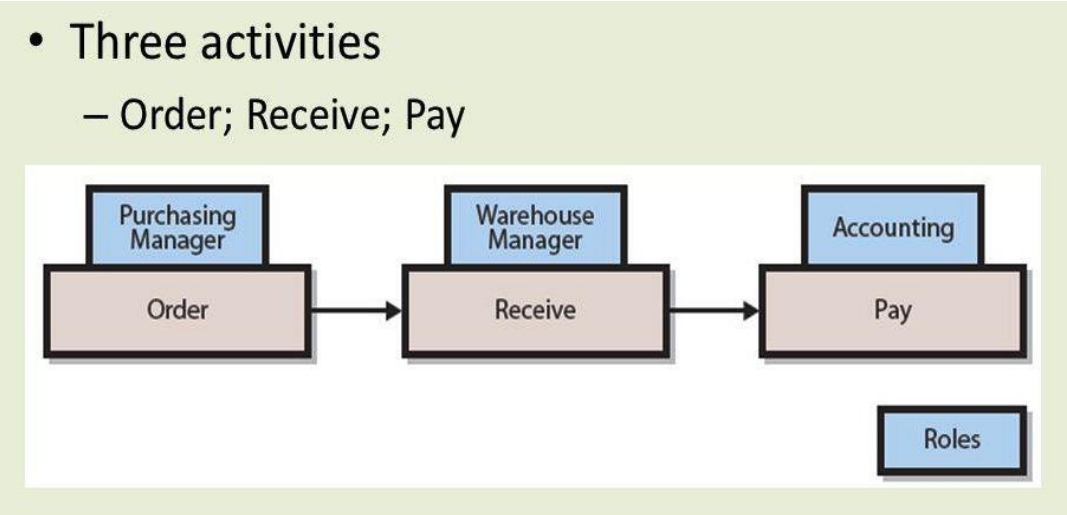


Figure: Fundamental Procurement Process and activities

As of now, the number of orders served from the inventory is roughly 75%, with 25% orders being served by procuring just-in-time. Procuring just-in-time is comparatively more expensive as the volumes for such orders are low, and the supplier discount offered therefore is considerably lower.

However, when ordering for inventory, bulk purchase is made and hence a much better price is realized. Therefore, the company would ideally like to move to a ratio of 9:1 ratio of orders served through inventory to those procured just-in-time.

As a caveat however, there is an inherent trade-off between the company's long term objective of reducing just-in-time procurement, and its motto of "Consumer Delight". This is because in order to maximize consumer delight, the company would have to strive to serve all types of consumer orders and provide them with the maximum possible variety of products, which would require just-in-time procurement since many products have limited demand and cannot be stored as inventory.

However, operational efficiency demands rationalization of product line and choosing one's customers.

Sourcing at Flipkart is conducted at two levels:

a) Regional: By Regional Procurement Teams
b) Centre: By the Central Procurement Team

Each regional procurement team has a network of local suppliers for made-to-stock as well as on on-demand (Just in-time) procurement. They also have visibility of the stock for different SKUs with these suppliers, as last updated on the procurement team's system by these suppliers. From Flipkart's perspective:

- **Stock out**: Defined as when the product is unavailable in the inventory (held in warehouses) as well as Flipkart's suppliers (as last updated)

The central procurement team has visibility of all the regional procurement teams" views, and therefore can monitor the stock levels for their suppliers all over the country. The central team's focus is on bigger suppliers with a country-wide reach.

SERVICE OVERVIEW OF PROCUREMENT LOGISTICS:

The processes and propose new strategies for procurement logistics in order to Improve Supply Chain Performance. The following tasks should be considered;

- Improving accuracy of demand forecasting by means of advanced methods.
- Selection of appropriate inventory models through simulation and optimization.
- Analysis of impact of different inventory policies on supply chain processes.
- Selection of type of supply (centralized / decentralized).
- Choice of supply strategies (direct replenishment, stocked flow, cross docking).
- Replenishment policy taking into account considerations of retail such as order days' management (Shelf connected supply chain).

FLIPKART'S WAREHOUSE MANAGEMENT SYSTEM

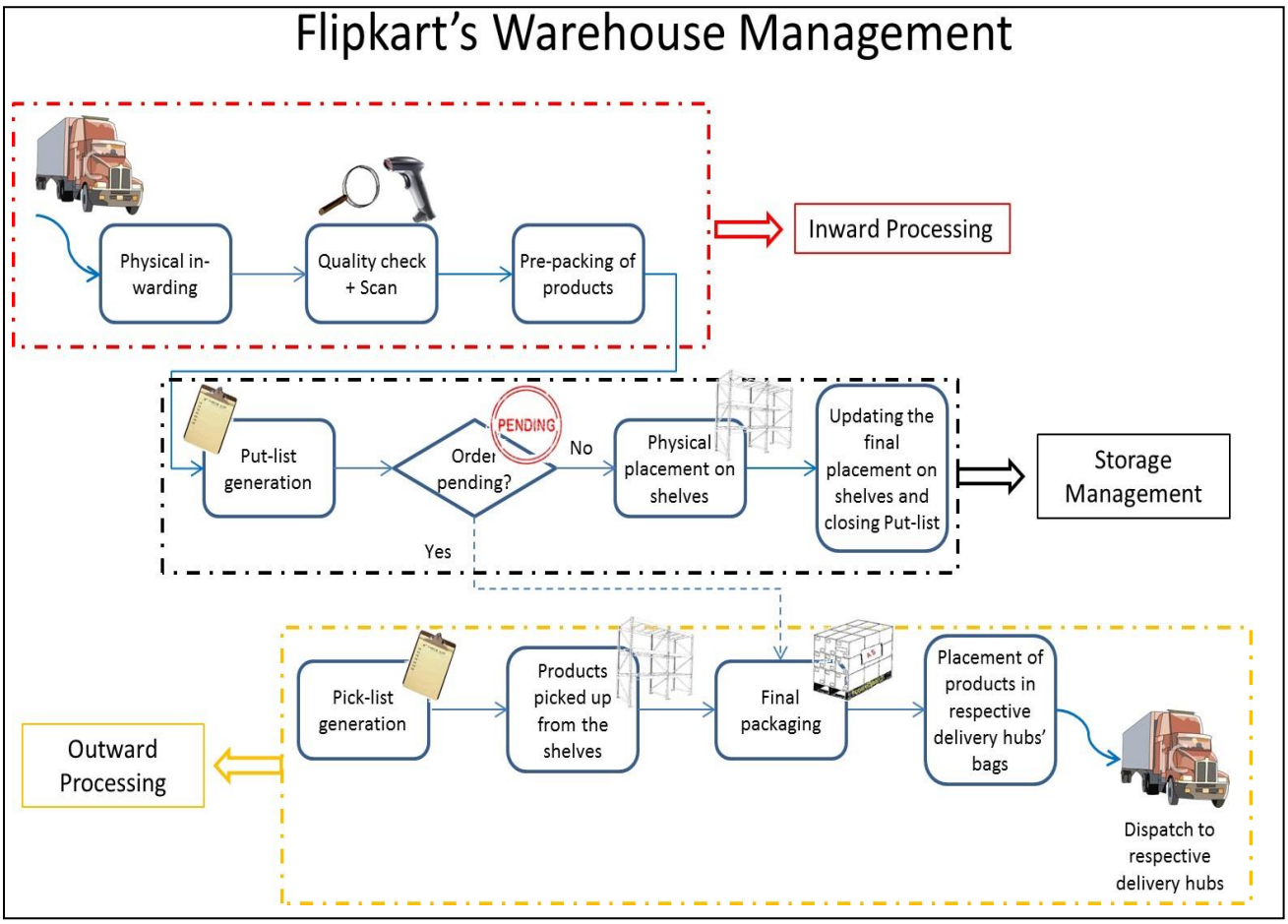


Figure: Flipkart's Warehouse Management System

Flipkart has 7 major warehouses spread across the country in Mumbai, Kolkata, Delhi, Noida, Pune, Chennai and Bangalore. They have smaller regional distribution centers at over 500 locations spread across Tier I and high volume Tier II cities.

In Flipkart's Warehouse Management System (WMS), there are three major segments namely, Inward Processing, Storage Management and Outward Processing. Discussed below are thesome of the details regarding each of the sub-processes involved in the WMS.

INWARD PROCESSING

1. ***Physical inwarding***: This is the area where physical delivery of goods from suppliers to the warehouse is taken.

2. ***Quality Check + Scan:*** As soon as the goods are received, they go through an initial quality check at this stage. After this, they are scanned to make an electronic entry to record the input of goods into the warehouse on the IT systems. This step of quality check is also undertaken at the supplier's premises depending on the contract that Flipkart has with them.

3. ***Pre-packing of products****:* At this stage, an initial packing of each of the products is done. This pre-packing varies according to product. For instance, a book-mark and think transparent film packing will be done for a book. Similarly, if there is a freebie attached to a product, then the two products will be packed together.

STORAGE MANAGEMENT

1. ***Put-list generation****:* When the input of all products is done on the IT systems, a system generated list of shelves corresponding to the products is generated to facilitate placementof products on shelves. This is called Put-list generation, which marks the place where the respective items need to be put.

2. ***Order pending check:*** As soon as the system gets the input of the incoming products, system checks if any of the orders for the incoming products are pending or not. If orders are pending, the respective product is sent directly to the Final Packaging Area for Outward Processing.

3. ***Physical placement on shelves:*** Based on the Put-list, the products are placed on the respective shelves. If the marked shelves are not empty, the product is put on an empty shelf, and the respective shelf number is updated on the Put-list.

4. ***Closing Put-list*****:** Once the product placement is done, Put-list is updated with the actual placement information and the list is Closed.

OUTWARD PROCESSING

1. ***Pick-list generation****:* Based on the orders to be delivered for the day, a Pick-list is generated by the IT system.

2. ***Pick-up from shelves:*** The respective products from the Pick-list are picked up from the shelves as per the IT system entries and gathered together to move towards Final Packaging Area.

3. ***Final packaging****:* The picked-up products are packed in Flipkart-branded boxes. At this stage, packaging is done according to the Category of the product, e.g., electronic items are packed differently from stationery.

4. ***Placement in respective delivery hubs' bags:*** After the final packaging, a product is placed in a specific bag which is dedicated for that destination area delivery hub. These bags are dispatched to their respective delivery hubs on a fixed timing during the day.

Some issues identified at the Warehouse Management level:

- All the scans while conducting inward processing for each of the products are done manually. There is some scope of automation at this stage.
- Due to packaging litter, there emerge chances of difficulty in mobility within the warehouse. Disposal of packing material may be addressed for better streamlining and ease of mobility.
- Currently, there are separate sections for separate categories in the storage area, e.g., in the Bangalore warehouse, a whole floor is dedicated to books, while the other floor is dedicated to other categories. With the increase in the number of SKUs that Flipkart is undertaking for sale, the Warehouse management system's complexity will increase and its scalability in the current form might come under question. Hence, pre-emptive efforts may be made to make sure that the systems and processes are scalable based on increasing variety and quantity of SKUs handled.

ORDER PROCESSING

Flipkart uses its own ERP systems to process orders and track the details of all the transactions that need to be carried out. A typical order at Flipkart starts with the customer searching, selecting the required item and placing the order. This on an overage takes around 8-10 clicks to get the order placed. The email Id is considered to be the unique identification of a customer and all the records are maintained with reference to this Id.

The payment can be made by using debit card, debit card, Net banking or COD (Cash on Delivery). The payment gateway used is powered by CC Avenue. Flipkart is working to have its own payment gateway which has not been possible so far because hosting a payment gateway requires fulfillment of Payment Card Industry Data Security Standards (PCI DSS).

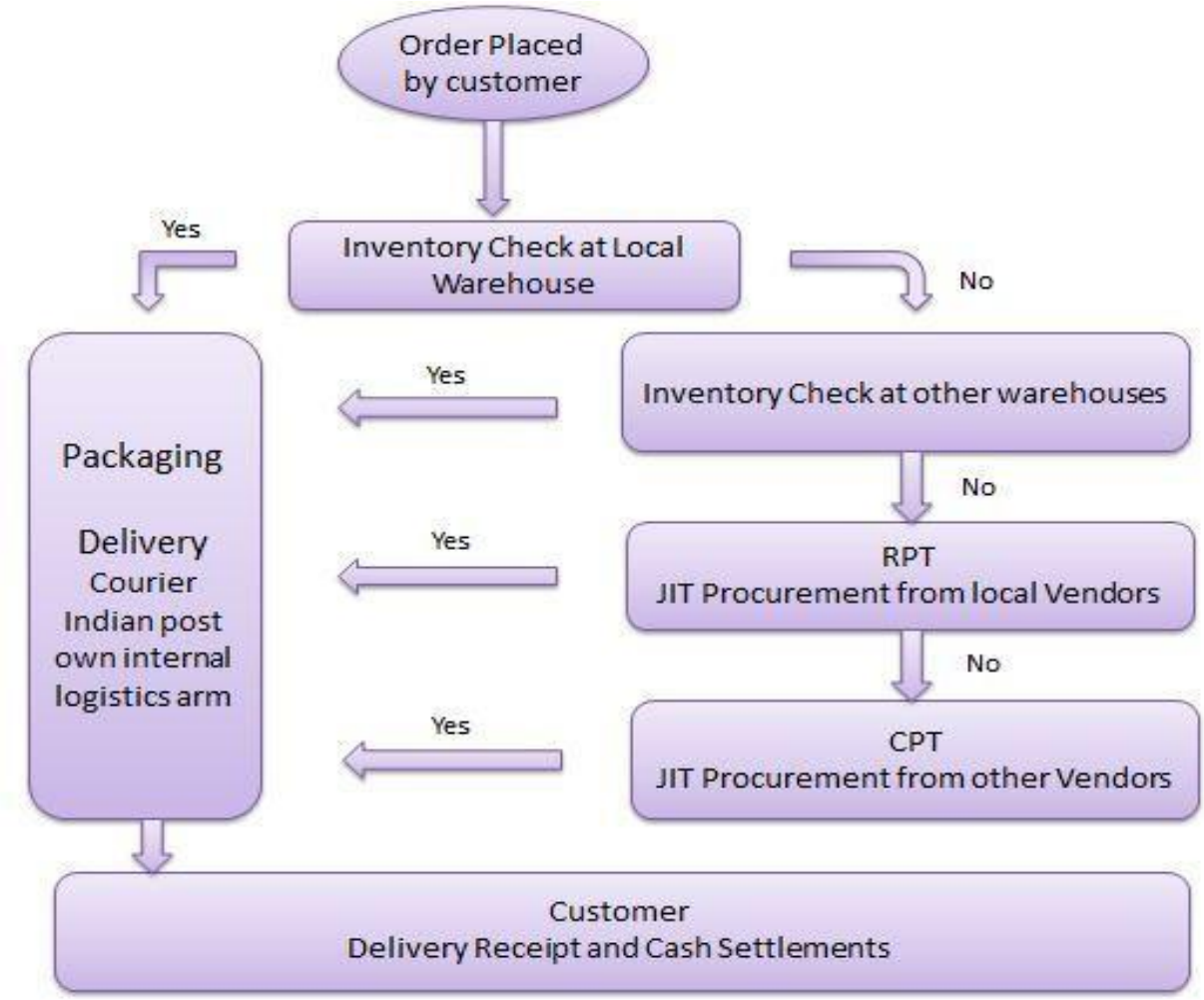


Figure: Order Processing

ORDER FULFILLMENT

Customer orders are fulfilled either via Inventory or JIT procurement depending upon the availability of the products.

1. As soon as the order is placed and approved, there is an inventory check done at the local warehouse. If the item is not found at the local warehouse, then the order goes to the nearest and then other warehouses. The product is then packaged and delivered to the customer.
2. If the item is not found in the inventory it is forwarded to the Regional Procurement Team (RPT) for JIT procurement from local vendors. If yet not possible, the order goes to the central procurement team (CPT)for the last option of procurement. After procuring from the vendor, the product is packaged and delivered to the customer via the most convenient warehouse. They have an understanding with their vendors for order

tracking, reconciliation and MIS (Management Information Systems).

As and when the item is found, it is packaged then and there and shipped to the customer via either courier, Indian post or its own internal logistics arm depending upon the area where the item need to be delivered.

The customer is kept updated on the status of his shipment via message, email and/or through website. An item is labeled out of stock only if it is not neither present in the warehouses nor with the vendors.

Flipkart, with its focus on customer delight, ensures an excellent after-sales service to its customers with regard to the delivery and/or addressing grievances related to any faulty or unsatisfactory products. The return of such items is done in an effective manner without any disputes.

This is possible given the understanding with the vendors. For example, in case of electronics, warranty and after-sales service is largely manufacturer's responsibility. Whenever required, Flipkart facilitates a smooth interaction between the customer and manufacturer/service center.

INVENTORY MANAGEMENT

The inventory stocks are replenished whenever it goes below Reorder point. In order to decideon reorder point and demand forecasting of each SKU, the company employs Holt's forecasting method. Holt's method is useful in cases where linear trends are present and requires separate smoothing constants for slope and intercept. The forecasted demand used at Flipkart using Holt'smethod is based on historic trend and seasonality in not accounted.

The company employs FIFO (First In First Out) method for its inventory management, under which for any shipment request to a particular warehouse the oldest inventory items are shipped first. This makes a lot of sense especially for the electronics items since the technology becomes obsolete very quickly.

With respect to determining what items to store in the warehouse and what items to be procured from vendors, Flipkart uses Long Tail Concept, which is nothing but selling a large number of unique items with relatively small quantities. Flipkart orders such items on adhoc basis and usually don't keep inventory of such items since the demand for such items is very less and thereby minimizing overall distribution and inventory costs.

SUPPLIER MANAGEMENT

Flipkart has always operated on the philosophy of starting out small and then scaling up as demand grows. It has been the same with selection of suppliers. For a new category, they generally start of by sourcing from local suppliers and distributors. Once there is enough demand generated, they approach the larger wholesalers or manufacturers directly. This serves two main purposes:

1. It helps them to get better deals from the bigger manufacturers if they can order in larger quantities frequently enough.
2. It avoids the channel conflict dilemma that large suppliers face when they agree to similar terms with a smaller volume online player like Flipkart as compared to an established offline distributor.

An example of this strategy mentioned by Pawan Raghuveer, Mgr. Flipkart Supply Chain Excellence Division, is that given that Flipkart is now India's largest online retailer of books and they are larger than many offline stores as well – most of Flipkart's books are sourced directly from publishers.

Across product categories, Flipkart works with over 500 suppliers including several international suppliers as well. Flipkart's steady rate of growth has allowed them to get the best credit lines from their suppliers. They signed their first international supplier deal with Ingram Books in 2008 and they prefer working with them due to high level of predictability.

In fact, considering that customer delight is Flipkart's primary motto, any delay in supply can lead to late deliveries to the end-customer. So Flipkart follows a grading system of its suppliers based on their fill-rate performance. Suppliers are grouped into A, B and C grades based on their past performance.

There are several other secondary considerations while placing an order with a supplier:

1. **Price considerations** – As mentioned before – credit lines and discount terms play an important part in selecting suppliers.
2. **Quality Check contract** – Depends on whether QC will be done at supplier's place and then product will be shipped to Flipkart's warehouses or if the QC has to be done at Flipkart's warehouses.

3. **Percentages of Returns Accepted** – Higher the percentage of returns accepted by a supplier, the better for Flipkart.

CUSTOMER SUPPORT

Customer Support function for an e-commerce website is one of the most important touch-points for the business in terms of building trust, customer acquisition and maintaining customerloyalty.

Flipkart's Customer Support team consists of call-center agents who handle in-bound and out- bound calls and also a team that handles e-mail queries. The entire team is based out of Bangalore and forms a core part of Flipkart's 6,000-strong employee base. Given that Flipkart tries to differentiate itself on superior shopping experience and customer service is an integral part of that – Flipkart prefers to train its own support staff rather than outsourcing the function to a BPO agency.

At present, a customer calls due to one of the below reasons:

1. Sales Assistance
2. General Enquiries
3. Product/Shipping related enquiry

One of the major reasons for these calls is Indian consumer's poor familiarity with online shopping protocols. It is important to note that Flipkart tries to ensure that any order is placed within 6 clicks on the website.

There is also an outbound call-center that performs the following tasks:

1. Pro-actively inform customers about any delay in deliveries.
2. Pro-actively check the status of refunds or returns.
3. Inform the user in case any delivery has not been successful due to the customer notbeing present at his address.

Despite all the good intentions of Flipkart in providing high-quality customer service, there are several internet blogs that suggest that their service quality has dipped in the last year or

so. A major reason for this could be the growth in number of customer service executives' not keeping pace with the increase in business volume. There could also be a problem of increased complexity in query handling due to increase in number of SKUs and product categories that would demand more rigorous training for the support staff.

ACQUISITIONS

2010:

WeRead, a social book discovery tool. The stated goal was to give Flipkart a social recommendation platform for buyers to make informed decisions based on recommendations from people within their social network.

2011:

Mime360, a digital content platform company.

2011:

Chakpak.com is a Bollywood news site that offers updates, news, photos and videos. Flipkart acquired the rights to Chakpak's digital catalogue which includes 40,000 filmographies, 10,000 movies and close to 50,000 ratings. Flipkart has categorically said that it will not be involved with the original site and will not use the brand name.

2012:

Letbuy.com is India 's second largest E-retailer in electronics. Flipkartbought the company for an estimated US$ 25 million.

2014:

Acquired Myntra.com in an estimated INR 2,000 crore deal.

2015:

Flipkart acquired Appiterate, a Delhi-based mobile marketing automation firm.

2016:

Flipkart acquired the online fashion retailer Jabong.com from Rocket Internet for $70 million and the UPI mobile payments startup PhonePe.

ACQUISITION BY WALMART

On 4 May 2018, it was reported that the US retail chain Walmart had won a bidding war with Amazon to acquire a majority stake in Flipkart for $15 billion. On 9 May 2018, Walmart officially announced its intent to acquire a 77% controlling stake in Flipkart for $16 billion. Following the purchase, Flipkart co-founder Sachin Bansal left the company.

The remaining management team now reports to Marc Lore, CEO of Walmart e-commerce US. Walmart president Doug McMillon cited the "attractiveness" of the market, explaining that their purchase "is an opportunity to partner with the company that is leading transformation of e-commerce in the market". Indian traders protested against the deal, considering the deal a threat to domestic business.

In a filing with the U. S. Securities and Exchange Commission on 11 May 2018, Walmart stated that a condition of the deal prescribed the possibility that Flipkart's current minority shareholders "may require Flipkart to effect an initial public offering following the fourth anniversary of the closing of the transactions at a valuation no less than that paid by Walmart".

Following the announcement of Walmart's deal, eBay announced that it would sell its stake in Flipkart back to the company for approximately $1.1 billion and relaunch its own Indian operations. The company stated that "there is the huge growth potential for e-commerce in India and significant opportunity for multiple players to succeed in India's diverse, domestic market." Softbank Group also sold its entire 20% stake to Walmart without disclosing terms of the sale.

The acquisition was completed on 18 August 2018. Walmart also provided $2 billion in equity funding to the company.

On 13 November 2018, Flipkart CEO Binny Bansal resigned after facing an allegation of "serious personal misconduct". Walmart stated that "while the investigation did not find evidence to corroborate the complainant's assertions against Binny, it did reveal other lapses in judgment, particularly a lack of transparency, related to how Binny responded to the situation."

SWOT ANALYSIS

Strength:

- ✓ Top Indian ecommerce portal
- ✓ Diversified into electronic goods
- ✓ Two VC investment to build its own delivery system thereby reduce delivery time
- ✓ Cash on delivery which is making 60% of its income
- ✓ Industry condition: very high potential
- ✓ Investor's trust
- ✓ Services and warehousing
- ✓ Payment options
- ✓ Established brand

Weakness:

- ✓ Coordination with suppliers and courier was tough
- ✓ Price biasing to maintain the margins (e.g. Low price for the best seller book and moreprice for the least wanted)
- ✓ 24/7 customer care, thus even mid night is to delivered within 24 hours
- ✓ Entry of international on-line competitors in Indian market
- ✓ Customers are not comfortable with online payment
- ✓ Not profitable operationally
- ✓ Time to build confidence among the customers
- ✓ Middle management retention issues.

Opportunities:

- ✓ Already working towards customer delight will obtain customer loyalty gradually
- ✓ Supplier database interface with flipkart website for JIT procurement
- ✓ Mobile internet usage is increasing there by chances of increase in sales through mobile shopping.
- ✓ Development of m-commerce in the e-market
- ✓ Increasing internet penetration
- ✓ Target social medias to reach young population
- ✓ High interest among VC/PE.

Threats:

- ✓ Small players and emerging competitor
- ✓ In capabilities to manage certain costs like delivery cost, bank charges
- ✓ High competition from major international online retailers
- ✓ Capture of alternative market by competitors
- ✓ Major players like Amazon

INDUSTRY ANALYSIS

POTERS 5 FORCES –

Bargain power of suppliers (low)

- The readers are reducing thus suppliers are in weak position
- Inventory turnover is lower, thus more inventory again flipkart is at the upper hand

Bargain of buyers (high)

- Not many buyers
- Best deals online
- Cash on delivery
- One stop solution
- Faster delivery with free shipping cost

Threat of New entries (High)

- Market potential for this industry is high
- Low entry barriers, but sustaining is tough

Threat of substitutes (Low)

- Diminishing brick and mortar model
- Increasing customer ease and customer satisfaction

Industry rivals (Medium)

- Many small players (Snap deal, Naaptol)
- Entry of International players like Amazon into India.

Chapter- 3

Competitor Analysis

MAJOR COMPETITIORS

Amazon.com is an American international electronic commerce company with headquarters in Seattle, Washington, United States. It is the world's largest internet company, based on revenue and number of employees.

Snapdeal.com is an online marketplace, headquartered in New Delhi, India. The company was started by Kunal Bahl and Rohit Bansal, in February 2010.

eBay Inc., is an American multinational corporation and e-commerce company, providing consumer-to-consumer sales services via Internet. It is headquartered in San Jose, California, United States.

HomeShop18 is an online and on-air retail and distribution venture of Network 18 Group, India. HomeShop18 was launched on 9 April 2008 as India's first 24-hour Home Shopping TV channel.

Yebhi.com is an Indian Online Shopping E-commerce portal for Home, Lifestyle & Fashion e- retailer, launched in the year 2009.

MARKET SEGMENTATION

The process of defining and subdividing a large homogenous market into clearly identifiable segments having similar needs, wants, or demand characteristics. Its objective is to design a marketing mix that precisely matches the expectations of customers in the targeted segment.

Few companies are big enough to supply the needs of an entire market; most must breakdown the total demand into segments and choose those that the company is best equipped to handle. The four basic market segmentation-strategies are based on

GEOGRAPHIC SEGMENTATION -

- CATERS TO TIER 1, TIER 2 AND TIER 3 CITIES

DEMOGRAPHIC SEGMENTATION -

- 75% of online users between the age group of 15-34 years.
- Flipkart targets mainly the youth of the country

BEHAVIOURAL SEGMENTATION –

- Web friendly people.

PSYCHOGRAPHIC SEGMENTATION –

- Flipkart concentrates on more Psychographic, which helps in deciding where to displayads online
- They target online shoppers and people who don't online shop (thus TVC to encourage them)

SUPPLY CHAIN MANAGEMENT – PROCESS:

Supply chain management is a process used by companies to ensure that their supply chain is efficient and cost-effective. A supply chain is the collection of steps that a company takes to transform raw materials into a final product. The five basic components of supply chain management are discussed below:

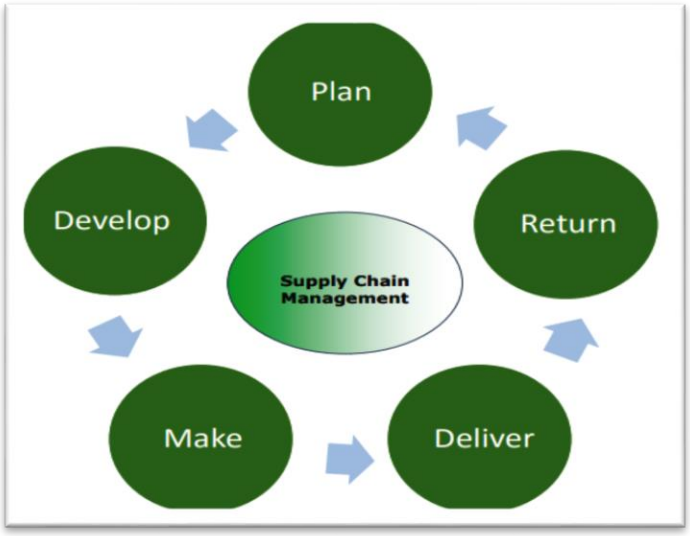


Figure: Supply Chain Management Process

- ***Plan:*** The initial stage of the supply chain process is the planning stage. We need to develop a plan or strategy in order to address how the products and services will satisfy the demands and necessities of the customers. In this stage, the planning should mainly focus on designing a strategy that yields maximum profit.

- ***Develop (Source):*** In this stage, we mainly concentrate on building a strong relationship with suppliers of the raw materials required for production. This involves not only identifying dependable suppliers but also determining different planning methods for shipping, delivery, and payment of the product. So in this stage, the supply chain managers need to construct a set of pricing, delivery and payment processes with suppliers and also create the metrics for controlling and improving the relationships.

- ***Make:*** The third step in the supply chain management process is the manufacturing or making of products that were demanded by the customer. In this stage, the products are designed, produced, tested, packaged, and synchronized for delivery. This stage is considered as the most metric-intensive unit of the supply chain, where firms can gauge the quality levels, production output and worker productivity.

- ***Deliver:*** The fourth stage is the delivery stage. Here the products are delivered to the customer at the destined location by the supplier. This stage is basically the logistics phase, where customer orders are accepted and delivery of the goods is planned.

- ***Return:*** The last and final stage of supply chain management is referred as the return. In the stage, defective or damaged goods are returned to the supplier by the customer. Here, the companies need to deal with customer queries and respond to their complaints etc.

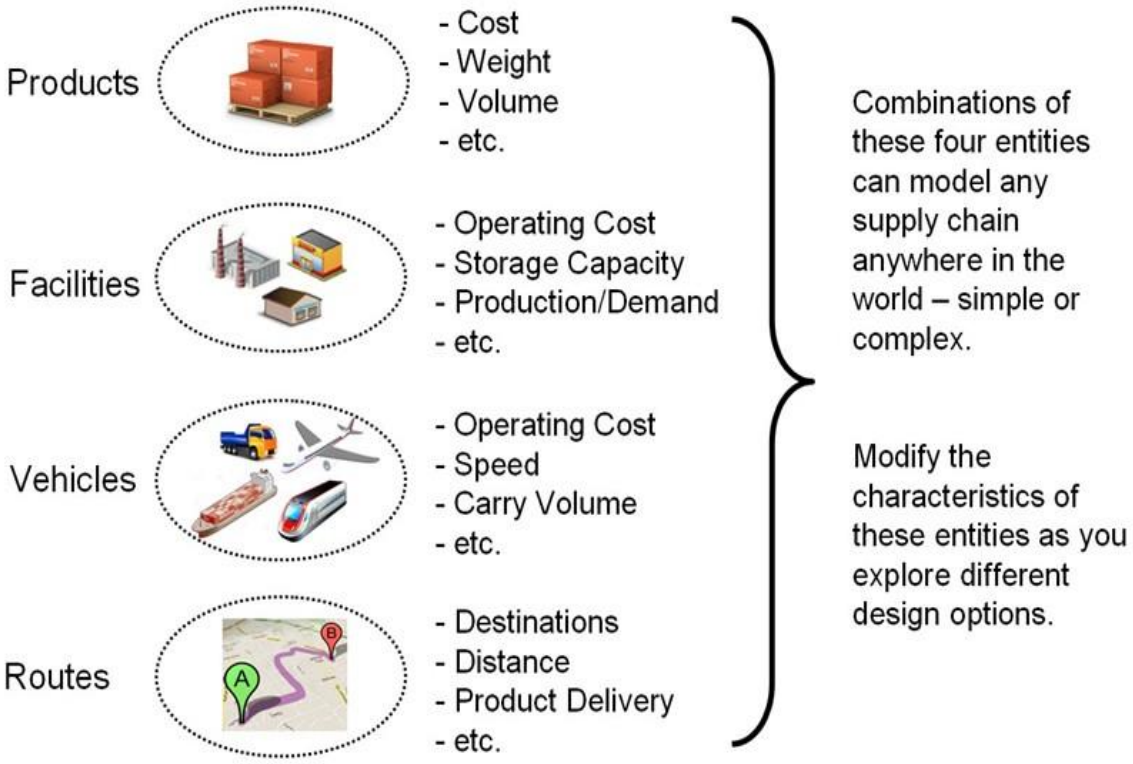
Chapter- 4

Customer Analysis

SUPPLY CHAIN AS A NETWORK OF ENTITIES:

A supply chain is a network between a company and its suppliers to produce and distribute a specific product to the final buyer. This network includes different activities, people, entities, information, and resources. The supply chain also represents the steps it takes to get the product or service from their original state to the customer. The entities in the supply chain include PRODUCTS; FACILITIES; VEHICLES; ROUTES. These entities relate to each other and their interactions are what drive supply operations and produce the simulation results.

1. **PRODUCTS:** things in demand at facilities
2. **FACILITIES:** places where products are made, stored or consumed
3. **VEHICLES:** mechanisms to move products between facilities to meet demand
4. **ROUTES:** paths taken by vehicles to move products between facilities.



Supply chain management is a conscious effort to run supply chains in the most efficient and effective way possible. Such strategies include product development, sourcing, production and logistics, each of which assists in creating quality products and coordinating their flow to the consumer. The supply chain exists in many different forms, but the most common structure contains four separate entities:

1. **Suppliers.** These entities provide the materials needed to create the product, whether they're raw materials or individual parts to a finished product. For example, Apple's iPad comes from a variety of suppliers: Samsung manufactures its processor chips, LG produces the touchscreen display, and Toshiba creates the flash memory.

2. **Manufacturers.** This stage of the supply chain entails bringing together all of the parts provided by suppliers to create the finished product. Apple would take each individual part from the suppliers and put them together to create a finished iPad for distribution.

3. **Distributors.** These entities store and sell the finished product, either at a physical storefront or through an online store. Locations like Apple stores and Walmart provide physical locations where consumers can buy an iPad, whereas online distributors ship the iPad directly to a consumer's door.

4. **Customers.** Consumers create demand for products and ultimately influence the quantity of products and the overall supply chain structure.

PACKAGING INNOVATION:

- As we all know, right packaging is essential for a product to be successful, as it is the first thing that is noticed by a customer.
- Therefore, innovation should be a priority when it comes to product packaging, as consumers' needs and wants are always changing.
- Packaging Innovation. Turning new concepts into packaging that consumers use, trust, and love.
- Innovation in packaging gives you an opportunity to appeal to people's feelings and emotions that lead to more impulsive buying decisions, as well as creates brand loyalty for existing customers.

Production Packaging Innovations:

Production Packaging Innovations (PPI) is geared towards providing solutions for your packaging needs. PPI focuses on meeting customer needs and offering solutions in efficient

and affordable ways. Every organization commitment to innovation with expertise, manufacturing ability and materials, aim to provide designs that deliver in every way.

Enhancing your product's appeal:

When your new product is ready to take on the competition, you need packaging which makes that possible. That's where we come in. We help boost your product's appeal with packaging which;

- ✓ Distinguishes your product
- ✓ Promotes branding
- ✓ Protects your product
- ✓ Advertises your range
- ✓ Improves and increases transport options
- ✓ Displays assembly instructions efficiently

The packaging which performs these functions doesn't appear from nowhere, that's why Production Packaging Innovations' experience is vital. These stages include;

- ❖ Conceptual sketches / discussions
- ❖ Technical drawings
- ❖ Samples and adjustments
- ❖ Approval
- ❖ Package production

LOGISTICS PACKAGING SOLUTIONS ACROSS INDUSTRIES:

The design engineers work towards producing safe, attractive and environmentally-friendly results for clients. So the designer uses a range of materials to create the best packages for customer requirements. To give an idea of what company provide, here are a few of logistics packaging solutions:

- Shipper cartons
- Protective packaging / inserts
- Customized solutions
- Heavy duty packaging
- Mailing packs

- Wine bottle shippers
- Timber products
- Moisture protection

Marketing through packaging – creating impressions:

At PPI, it recognizes how important marketing is. In many ways it's the most vital function of commercial packaging, so we know how crucial this is to success. You get one chance to make that first impression, so we'll help make it count. Packaging that strive to create promotes corporate values through graphics. It reflects the product's positioning through design. Types of marketing packaging which include:

- Display stands
- Counter displays
- Brochure stands
- Sample packaging
- Gift boxes
- Wine gift packs
- Window displays
- Polypropylene

Design facilities and a process that delivers:

The motto is 'design that delivers'. To back this, company's CAD design equipment, coupled with expertise, to help create designs which make a difference. From sketched idea to cardboard sample. Packaging options are endless, but time and money aren't, so the aim to create a solution which does what customer need. When in production, it considers the following:

- Item quantities to be manufactured
- Budgets
- Product endurance
- The best manufacturing route
- Alternatives and style

MODERN PACKAGING INNOVATION:

Asceptic Packaging:

Process in which a food product, such as ultra-high temperature (UHT) milk and its package is sterilized separately and then combined and sealed under sterilized atmosphere. It increases the shelf-life.

Vacuum Packaging:

It is a procedure in which air is drawn out of the package prior to sealing but no other gases are introduced. This technique has been used for many years for products such as cured meats and cheese.

Modified atmosphere packaging (MAP):

Modified atmosphere packaging (MAP) is a procedure which involves replacing air inside a package with a predetermined mixture of gases prior to sealing it. The gases involved in modified atmosphere packaging, as applied commercially today, are carbon dioxide, nitrogen and oxygen.

- Carbon dioxide reacts with water in the product to form carbonic acid which lowers the pH of the food. It also inhibits the growth of certain microorganisms, mainly moulds and some aerobic bacteria.
- Nitrogen inhibits the oxidation of fats.
- Oxygen is included in MAP packages of red meat to maintain the red colour, which is due to the oxygenation of the myoglobin pigments.

Active packaging:

Active packaging is an innovative concept that can be defined as a mode of packaging in which the package, the product and the environment interact to prolong shelf-life or enhance safety or sensory properties, while maintaining the quality of the product. It allows the active preservation of foods, according to their needs, by modification of the environment inside the package by removing undesired gases or by regulating the composition of the gas in the package headspace. Active systems can be classified according to their functionality as scavengers, regulators and emitters, and their action can be specific for several substances (O2,

CO_2, ethylene etc.). The internal atmosphere may be regulated by substances that absorb (scavenge) or release (emit) gases or vapors.

Edible Packaging:

Edible packaging is defined as a thin layer of edible material formed on a food as a coating or placed (preformed) on or between food components. Natural polymers have been studied extensively for the development of edible packaging. A variety of polysaccharides (starch and hydrocolloids), proteins (whey proteins, soybean proteins and fish proteins) and lipids have been used, either individually or in mixtures, to produce edible films.

Intelligent or Smart Packaging:

Intelligent or smart packaging is basically designed to monitor and communicate information about food quality. It is essentially an integrating method that deals with mechanical, chemical, electrical and/or electronically driven functions that enhance the usability or effectiveness of the food product in a proven way. Some common examples of intelligent packaging are Time–Temperature Indicators (TTIs), ripeness indicators, biosensors and radio frequency identification.

PACKAGING MATERIALS:

The major categories of materials used for food packaging are glass, metals, paper and paperboard, and plastics. There are many multilayered packaging materials containing either layers of different plastics or combinations of plastics with paper/board, metal or glass. In many cases, a packaging material with two layers is chosen.

Types of packaging materials:

Paper:

Paper and paperboard are sheet materials produced from an interlinked network of cellulose fibers derived from wood by using sulphate and sulphite. The fibers are then pulped, bleached,

and treated with chemicals and strengthening agents to produce the paper product. Example: Kraft paper, sulphite paper, grease proof paper.

- ***Paperboard:***

Paperboard is thicker than paper, with a higher weight per unit area, and is often made in multiple layers. It is commonly used to make containers for shipping, such as boxes, cartons and trays and is used for direct food contact. There are several different types of paperboard, including white board, solid board, fiber board and chipboard. Carton boxes, trays, egg tray, tetra pack.

- ***Glass:***

The production of glass containers involves heating a mixture of silica (the glass former), sodium carbonate (the melting agent), limestone or calcium carbonate and alumina (stabilizers) to high temperatures until the materials melt into a thick liquid mass, which is then transferred to molds.

Advantages: Glass possesses very good barrier properties, so it maintains product freshness for a long period of time without impairing the taste or flavor, visibility of product, the ability to withstand high processing temperatures.

Disadvantages*:* Brittle, heavy and non-degradable.

- ***Plastics:***

Plastics are synthesized by condensation, addition or crosslinking polymerization of monomer units. In condensation polymerization, the polymer chain grows by condensation reactions between molecules and is accompanied by the formation of water or alcohol. The thermal and mechanical properties can be partially modified in order to manufacture retortable packages with plastics that have a high melting point, or thermosealable packages making use of plastics with a low melting point and to develop very flexible structures (sachets and wrappings), semi rigid structures (trays and tubs) and rigid structures (bottles, closures and tanks).

Polypropylene, polyethene, polyesters, polyethylene terephthalate, polycarbonate, poly ethylene naphthalate.

- ***Metals:***

Metals are the most versatile of all forms of packaging. They offer the combination of excellent physical protection and barrier properties, formability, decorative potential, recyclability, and consumer acceptance. Metal containers are vacuum-sealed and thermally sterilized under low oxygen pressure. The decomposition of nutrients is kept to a minimum in metal containers, since metals are a perfect barrier to oxygen, light and moisture. The major limitations of metal containers are cost, the weight of the containers and the fact that they are difficult to crush. Aluminum and steel are the most predominantly used metals in food packaging. Example: Aluminum, tin etc.

Functions of Packaging Materials:

Packaging materials have the four basic functions of providing protection, communication, convenience and containment. Traceability and tamper indication are said to be the secondary functions of increasing importance.

- ***Protection:*** One of the main objectives of the packaging of food is to protect it against spoilage or deterioration due to physical damage, chemical changes or biological damage.
- ***Communication:*** Any special instructions or information.
- ***Convenience:*** Ease of access, handling, and disposal; product visibility; reseal ability.
- ***Containment:*** Hold the contents and keep them secure until they are used.
- ***Traceability:*** Ability to track any food through all stages of production, processing and distribution.
- ***Tamper indication:*** Food tampering is the intentional contamination of a food product, with intent to cause harm to the consumer or to a private company. There are several measures to detect tampering, including banding, special membranes, breakaway closures, special printing on bottle liners or composite cans such as graphics or text that irreversibly changes upon opening and special printing that cannot be easily duplicated.

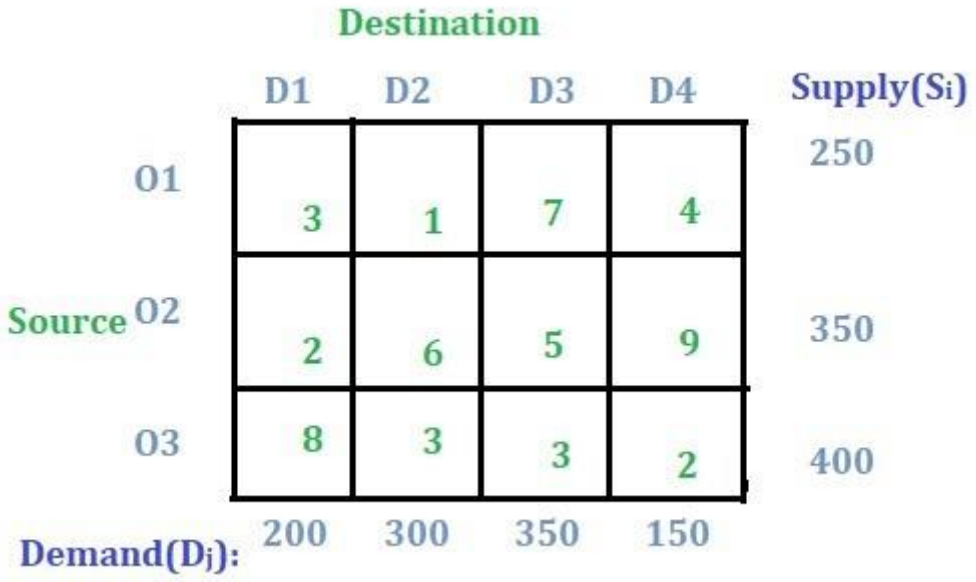
Chapter- 5

Actual Work done

TRANSPORTATION PROBLEM (MODI METHOD – UV METHOD)

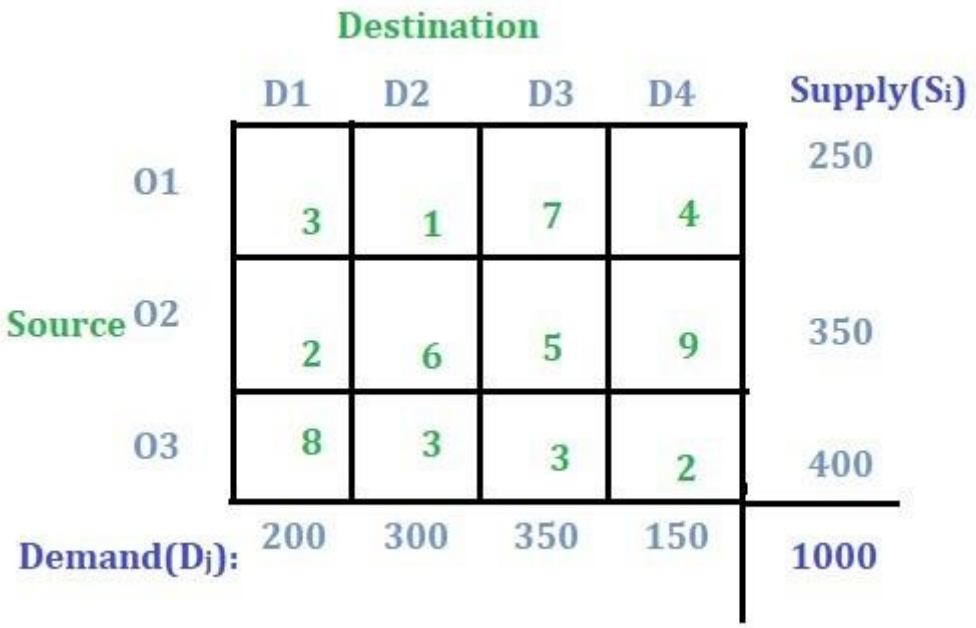
There are two phases to solve the transportation problem. In the first phase, the initial basic feasible solution has to be found and the second phase involves optimization of the initial basic feasible solution that was obtained in the first phase. There are three methods for finding an initial basic feasible solution.

1. NorthWest Corner Method
2. Least Cost Cell Method
3. Vogel's Approximation Method



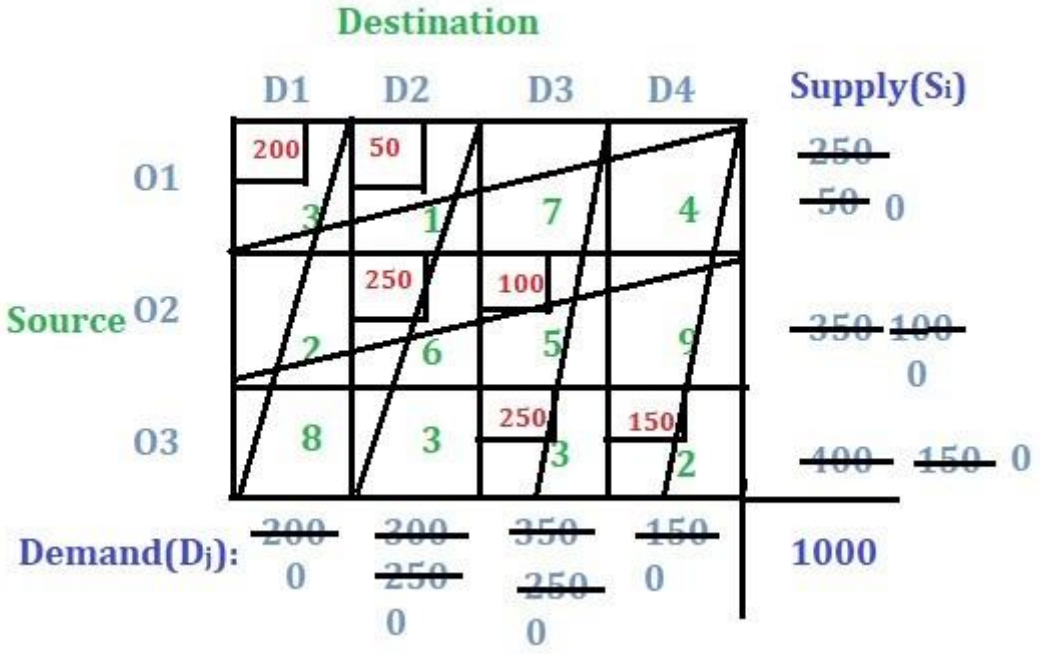
Solution:

Step 1: Check whether the problem is balanced or not.
If the total sum of all the supply from sources **O1**, **O2**, and **O3** is equal to the total sum of all the demands for destinations **D1**, **D2**, **D3** and **D4** then the transportation problem is a balanced transportation problem.



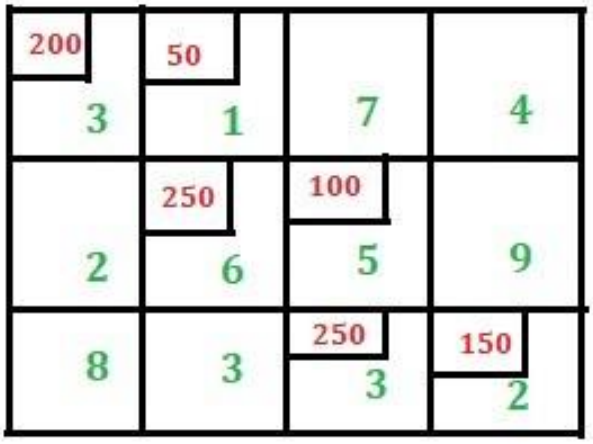
Note: If the problem is not unbalanced then the concept of a dummy row or a dummy column to transform the unbalanced problem to balanced.

Step 2: Finding the initial basic feasible solution.
Any of the three aforementioned methods can be used to find the initial basic feasible solution. Here, NorthWest Corner Method will be used. And according to the NorthWest Corner Method this is the final initial basic feasible solution:



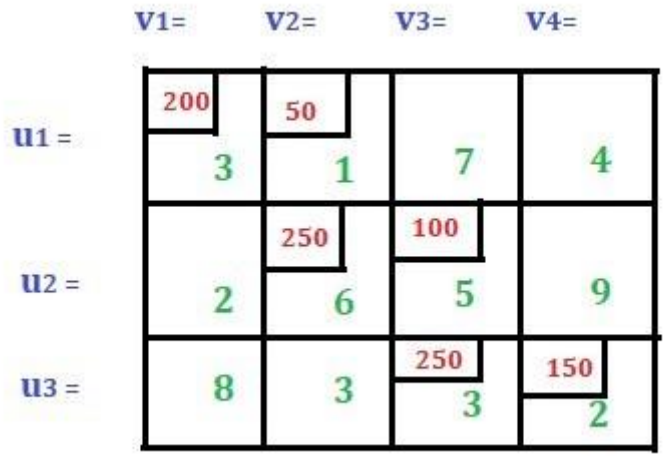
Now, the total cost of transportation will be **(200 * 3) + (50 * 1) + (250 * 6) + (100 * 5) + (250 * 3) + (150 * 2) = 3700**.

Step 3: U-V method to optimize the initial basic feasible solution. The following is the initial basic feasible solution:



– For U-V method the values $\mathbf{u_i}$ and $\mathbf{v_j}$ have to be found for the rows and the columns respectively. As there are three rows so three $\mathbf{u_i}$ values have to be found i.e. $\mathbf{u_1}$ for the first row, $\mathbf{u_2}$ for the second row and $\mathbf{u_3}$ for the third row.

Similarly, for four columns four $\mathbf{v_j}$ values have to be found i.e. $\mathbf{v_1}$, $\mathbf{v_2}$, $\mathbf{v_3}$ and $\mathbf{v_4}$. Check the image below:



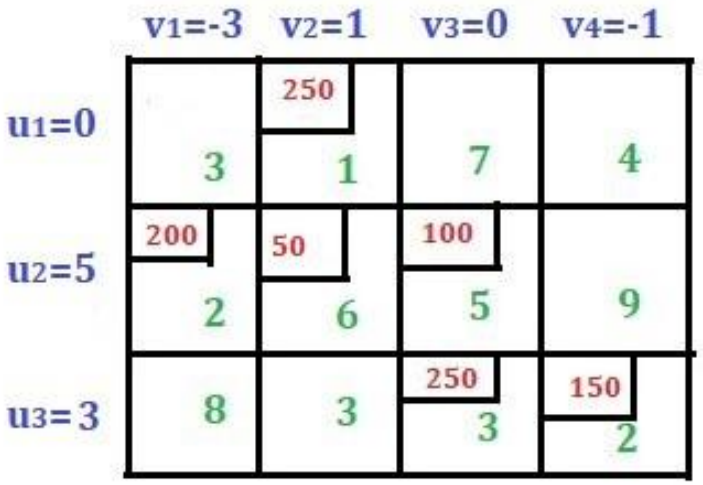
There is a separate formula to find $\mathbf{u_i}$ and $\mathbf{v_j}$, $\mathbf{u_i + v_j = C_{ij}}$

where $\mathbf{C_{ij}}$ is the cost value only for the allocated cell. Read more about it here.

Before applying the above formula, we need to check whether **m + n – 1 is equal to the total number of allocated cells** or not where **m** is the total number of rows and **n** is the total number of columns.

In this case m = 3, n = 4 and total number of allocated cells is 6 so m + n – 1 = 6. The case when m + n – 1 is not equal to the total number of allocated cells will be discussed in the later posts.

Now to find the value for u and v we assign any of the three u or any of the four v as 0. Let we assign $\mathbf{u_1 = 0}$ in this case. Then using the above formula, we will get $\mathbf{v_1 = 3}$ as $\mathbf{u_1 + v_1 = 3}$ (i.e. $\mathbf{C_{11}}$) and $\mathbf{v_2 = 1}$ as $\mathbf{u_1 + v_2 = 1}$ (i.e. $\mathbf{C_{12}}$). Similarly, we have got the value for $\mathbf{v_2 = 1}$ so we get the value for $\mathbf{u_2 = 5}$ which implies $\mathbf{v_3 = 0}$. From the value of $\mathbf{v_3 = 0}$ we get $\mathbf{u_3 = 3}$ which implies $\mathbf{v_4 = -1}$.



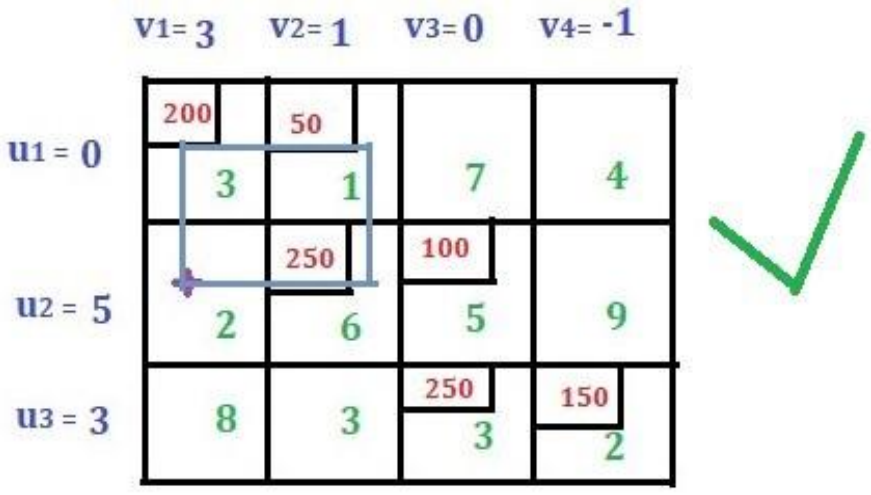
Now, compute penalties using the formula $\mathbf{P_{ij} = u_i + v_j – C_{ij}}$ only for unallocated cells. We have two unallocated cells in the first row, two in the second row and two in the third row. Let's compute this one by one.

1. For $\mathbf{C_{13}}$, $\mathbf{P_{13} = 0 + 0 – 7 = -7}$ (here $\mathbf{C_{13} = 7}$, $\mathbf{u_1 = 0}$ and $\mathbf{v_3 = 0}$)
2. For $\mathbf{C_{14}}$, $\mathbf{P_{14} = 0 + (-1) -4 = -5}$
3. For $\mathbf{C_{21}}$, $\mathbf{P_{21} = 5 + 3 – 2 = 6}$
4. For $\mathbf{C_{24}}$, $\mathbf{P_{24} = 5 + (-1) – 9 = -5}$
5. For $\mathbf{C_{31}}$, $\mathbf{P_{31} = 3 + 3 – 8 = -2}$
6. For $\mathbf{C_{32}}$, $\mathbf{P_{32} = 3 + 1 – 3 = 1}$

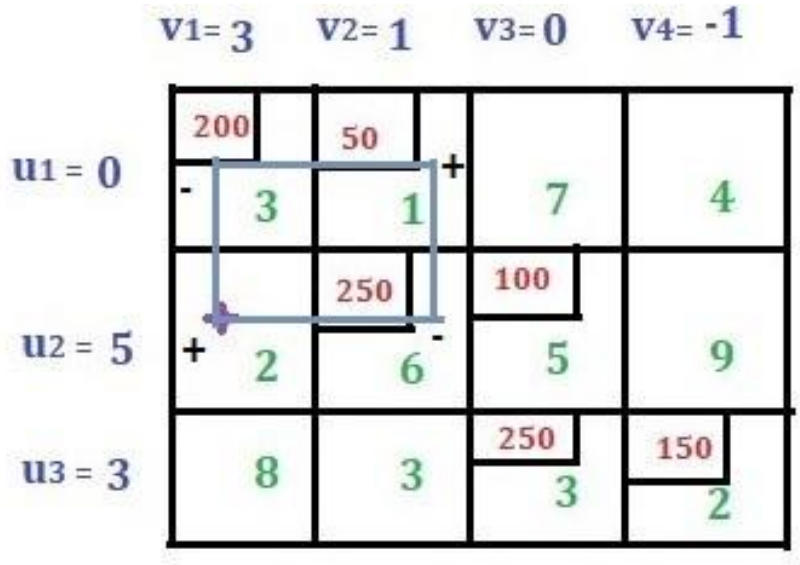
The Rule: If we get all the penalties value as zero or negative values that mean the optimality is reached and this answer is the final answer. But if we get any positive value means we need to proceed with the sum in the next step.

Now find the maximum positive penalty. Here the maximum value is 6 which corresponds to C_{21} cell. Now this cell is new basic cell. This cell will also be included in the solution.

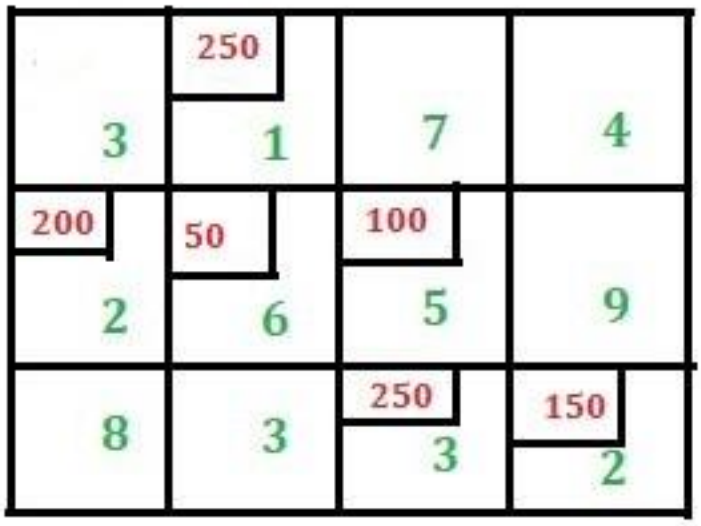
The rule for drawing closed-path or loop. Starting from the new basic cell draw a closed-path in such a way that the right angle turn is done only at the allocated cell or at the new basic cell.



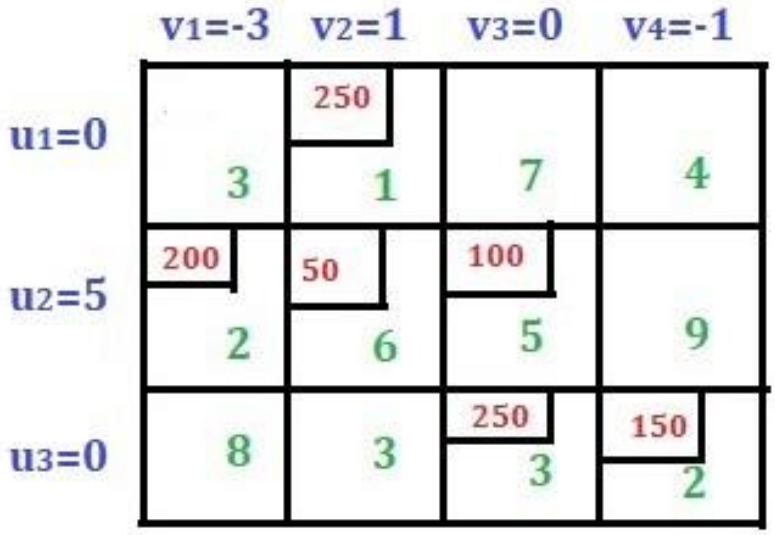
Assign alternate plus-minus sign to all the cells with right angle turn (or the corner) in the loop with plus sign assigned at the new basic cell.



Consider the cells with a negative sign. Compare the allocated value (i.e. 200 and 250 in this case) and select the minimum (i.e. select 200 in this case). Now subtract 200 from the cells with a minus sign and add 200 to the cells with a plus sign. And draw a new iteration. The work of the loop is over and the new solution looks as shown below.



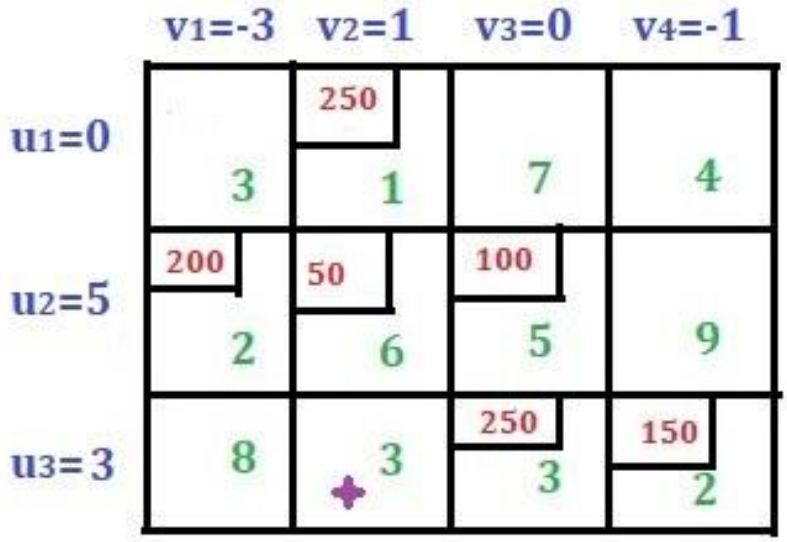
Check the total number of allocated cells is equal to (m + n – 1). Again find u values and v values using the formula $\mathbf{u_i + v_j = C_{ij}}$ where $\mathbf{C_{ij}}$ is the cost value only for allocated cell. Assign $\mathbf{u_1 = 0}$ then we get $\mathbf{v_2 = 1}$. Similarly, we will get following values for $\mathbf{u_i}$ and $\mathbf{v_j}$.



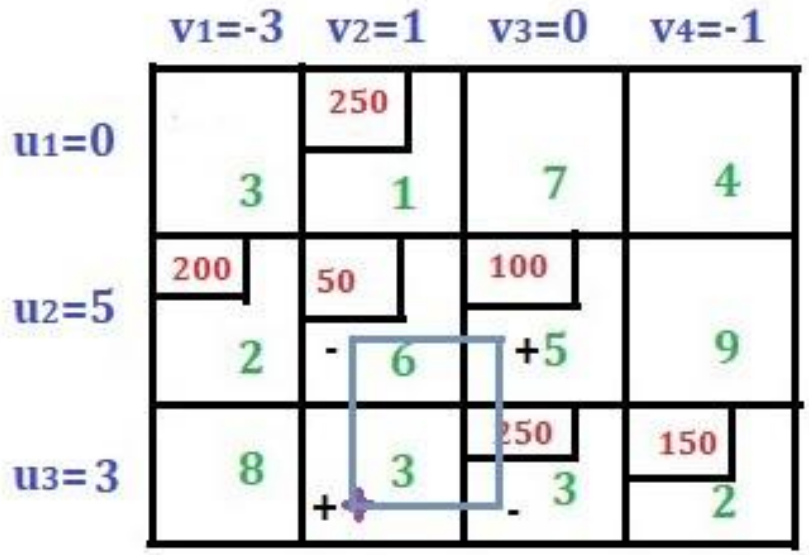
Find the penalties for all the unallocated cells using the formula $\mathbf{P_{ij} = u_i + v_j - C_{ij}}$.

1. For $\mathbf{C_{11}}$, $\mathbf{P_{11} = 0 + (-3) - 3 = -6}$
2. For $\mathbf{C_{13}}$, $\mathbf{P_{13} = 0 + 0 - 7 = -7}$
3. For $\mathbf{C_{14}}$, $\mathbf{P_{14} = 0 + (-1) - 4 = -5}$
4. For $\mathbf{C_{24}}$, $\mathbf{P_{24} = 5 + (-1) - 9 = -5}$
5. For $\mathbf{C_{31}}$, $\mathbf{P_{31} = 0 + (-3) - 8 = -11}$
6. For $\mathbf{C_{32}}$, $\mathbf{P_{32} = 3 + 1 - 3 = 1}$

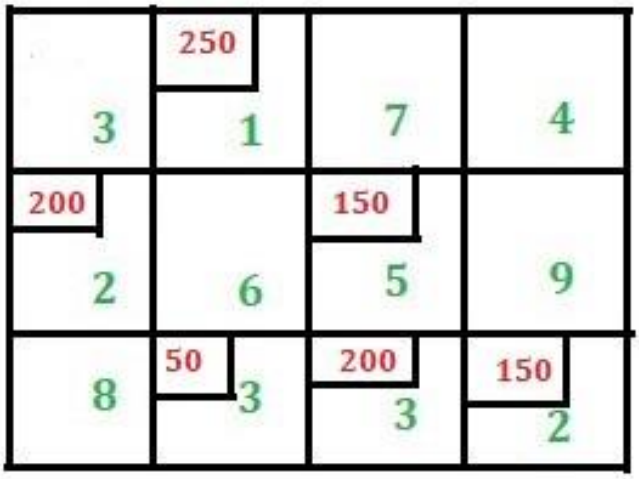
There is one positive value i.e. 1 for $\mathbf{C_{32}}$. Now this cell becomes new basic cell.



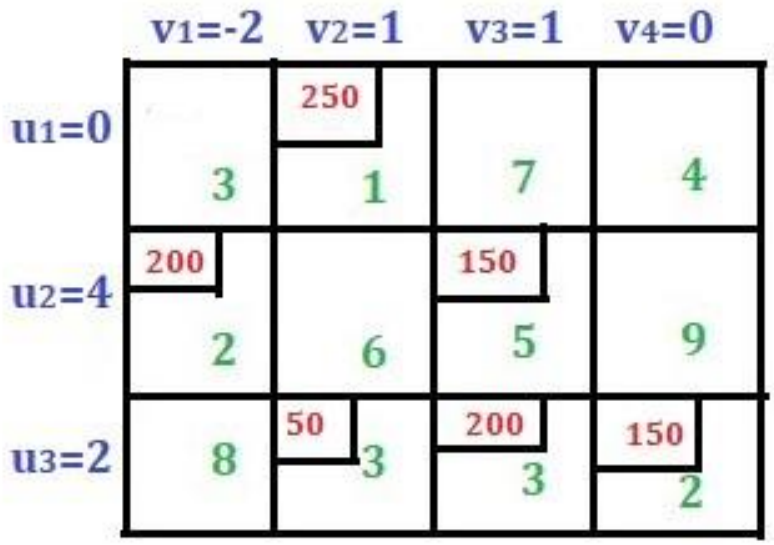
Now draw a loop starting from the new basic cell. Assign alternate plus and minus sign with new basic cell assigned as a plus sign.



Select the minimum value from allocated values to the cell with a minus sign. Subtract this value from the cell with a minus sign and add to the cell with a plus sign. Now the solution looks as shown in the image below:



Check if the total number of allocated cells is equal to (m + n – 1). Find u and v values as above.



Now again find the penalties for the unallocated cells as above.

1. For P_{11} = **0 + (-2) – 3 = -5**
2. For P_{13} = **0 + 1 – 7 = -6**
3. For P_{14}= **0 + 0 – 4 = -4**
4. For P_{22}= **4 + 1 – 6 = -1**
5. For P_{24}= **4 + 0 – 9 = -5**
6. For P_{31}= **2 + (-2) – 8 = -8**

All the penalty values are negative values. So the optimality is reached.

Now, find the total cost i.e. **(250 * 1) + (200 * 2) + (150 * 5) + (50 * 3) + (200 * 3) + (150 * 2) = 2450**

Chapter- 6

Conclusion

CONCLUSION

A credible rival can do wonders to an enterprise and Flipkart is no different. The entry of Amazon in India has enabled Flipkart develop a lot of in-house innovation and organically developed best-practices - that have now become the industry standard.

Flipkart began operations on the consignment model; goods were procured from suppliers on demand, based on the orders received through the website. Later, the books-to-electronics e-shop adopted the warehouse model. The company had its own warehouses, and maintained its own inventory. However, in July 2013, Flipkart launched its model of marketplace just one month after Amazon launched its marketplace in India.

It introduced payments brand PayZippy for online merchants and customers seeking fast, hassle- free and safe payment options. Some 70 per cent of its shipments are done by its own logistics company and about half of deliveries are on a cash-on-delivery basis.

Flipkart has recently introduced the next day guarantee delivery service and shopping from its own mobile application. Given the critical mass of transactions Flipkart controls - about 100,000 a day - the company is betting that it has the volumes to lay the foundation of what will be a profitable business.

Last but not the least; Flipkart has very clearly prioritized customer delight as its chief avenue for customer acquisition and retention. This causes them to build a lot of slack into their existing systems causing higher costs at several points in the supply chain. How they address this challenge is what will determine their future success.

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