

Supply Chain Management Analysis in Online Retailers and Logistics

Siddhant Changkakati, Shubhank Singh Chauhan, Shivam Verma, Dr. N Yuvraj
Mechanical Engineering,
Delhi Technological University

Abstract:- The world is changing, with invasion of the novel corona virus there has been a complete shift in humanity. The pattern in which society functions has been completely altered. This has had a great impact in the day to day businesses. This paper that we have researched might help normal businesses find their solutions to adopt with the incoming changes and challenges that came along with the onset of the following decade of 2020s. There is acute trend and a prediction that has been observed that online retailers are thriving these changing times. Sooner or later most businesses have to adapt to these changing times. This paper is going to study the aspect of logistics and supply chains of various online retailers that have succeeded in bring a level of success in their business. Tangible and particle solutions will be provided. Different strategies and techniques are studied to bring out best possible solutions are being highlighted in this paper. Through our knowledge in supply chain management that we have gathered in our college education we have tried to give our solutions on various challenges faced by businesses.

Key Words - Supply Chain Management (SCM), logistics, online retailer

I. INTRODUCTION

Supply chain management is an interesting subject. Physical shopping will be lessening in the coming decade. There is a greater need to make the product and service available to the consumers to their door steps. To make this process a success requires an intricate design of the supply chain. This paper is written in such a way as to guide the reviewer/reader to make a proper conclusion that will help their businesses thrive in online platforms. Before we start we would like to make you aware of the topics of supply chain that will help to progress further with the paper.

A. SCM TOPICS

- Facility Location:- This involves with the strategic placement of various facility locations. There are number factors that determines the locations of various facilities like proximity to the market, business climate, labor etc. the various ways of analysis of optimization of facility location are-
 - i. transportation method
 - ii. Centroidal method
 - iii. Cost-volume-profit ratio/ break- even analysis
 - iv. Factor rating method

- Plant Layout:- This involves with arrangement of the facility in order to have the maximum amount of productivity. There are different types of plant layout structures such as process layout, product layout group layout etc. various ways that are used to analyze and optimize are:-
 - i. systematic layout planning
 - ii. Block diagram
 - iii. Assembly line balancing
- Aggregate planning:- It deals with the subject of employment and manufacture and management of the product depending on the on the demand, supply and need of work force. It basically deals with the optimization of the workforce and product management based on the demand and supply.
 - i. Work force level in industries ii. Subcontracting
 - ii. Overtime
 - iii. Hiring and firing
- Inventory control:- To meet the demand in the market certain level of stock of the item is kept. It is classified according to the time it is required to sell of and the availability of the item. Thus it is classified into fast moving, slow moving, non moving and scarce, difficult, easy. There are various EOQ (Economic Order Quantity) models used to calculate the inventory.
- Forecasting:- Inventory management, manufacturing requires an amount of forecasting. This is done using the data of past experiences. There are two methods of forecasting quantitative and qualitative methods.

II. METHODOLOGY

A. Literature review

According to a paper published in iraj journal in 2014 by Ashu Nagpal and Bineet Singha the major challenges faces by retailer in Delhi NCR where highlighted. A survey was conducted on the various problems faced by the retailers. Lack of infrastructure and logistics had a mean rating of 3.91, inefficiency of supply chain had a mean rating of 3.94, and completion from e retailers had a mean ration of 3.49.

It is observed that in India the majority of the retailer are unorganized retailers. The retail industry in India is 200 billion US dollar industry. Organized retailers have a share of 3 percent of it which is 6.4 billion US dollars. The major problem faced by retailer in India is mostly related to supply chain and logistics requirement.

According to a paper published in IJRECT by Tanjeet Singh there is a big booming of the ecommerce industry. The facility of the internet has been used by various industries. It expands the market in national and international level. It improves the brand image of the company. Mode of transaction of money becomes easier. It reduces the exposure to outside environment. The customers are able to better review the product. But the main remain obstacle why retailers don't go for e-commerce platform is because they the basic idea and the knowledge and the expertise to venture into such platforms.

More than 60 percent of the workforces in India is in the agricultural sector. A paper was published in the journal research gate by M. Balakrishnan, B. Ganesh Kumar, Ch. Srinivasa Rao and S.K. Soam. This paper studies the aspects of agriculture and e-commerce. The main problems they face are lack of knowledge and literacy, the lack of electricity, lack of proper supply chain and lack of digital facilities.

One of the oldest and the largest manufacturing sector in India is the textile industry. It is also a vision of the government to digitalize India and to promote 'make in India'. The senerio of textile industries largely consist of handlooms.

The role of ecommerce in the clothing industry according to a paper published in researchgate by Ashok Kumar Panigrahi and Vijay Joshi in 2016 the benefits e-commerce can bring to clothing industry is generate employment, facilitate growth of allied industries, promote entrepreneurship, reduce transaction costs, easy access to consumer market.

B. Market scenario

Types of retailers in India

- a) Itinerant retailers
 - i. Hawkers and Peddlers
 - ii. Market traders
 - iii. Street trader
 - iv. Cheap jack

- b) Fixed small shop retailers
 - i. General store
 - ii. Specialty store
 - iii. Second hand goods shops
 - iv. Seconds store
 - v. Single line stores
- c) Fixed shop large retailer
 - i. Departmental stores
 - ii. Multiple shops chains stores
 - iii. Mail order retailing
 - iv. Consumer Co-operative store
 - v. Super markets

C. Different sectors of Indian economy

- Agriculture and forestry
- Auto components
- Automobile
- Aviation
- Fintech and financial service
- Biotechnology
- Capital goods
- Chemical
- Construction
- Defense manufacturing
- Electronic systems
- Food Processing
- Healthcare
- IT (Information Technology)and BPM (Business Process management)
- Leather
- Media
- Medical Devices
- Metal Mining
- Oil and Gas
- Pharmaceuticals
- Ports and shipping
- Railways
- Renewable energy
- Retails and e-commerece
- Roads and highways
- Telecom
- Textiles and Apparels
- Thermal Power
- Tourism and hospitality

D. Supply chain models of companies

1. Amazon

The goal of the company is to create the best customer centric country. The chain of events that takes place after a customer places an order from Amazon are as follows

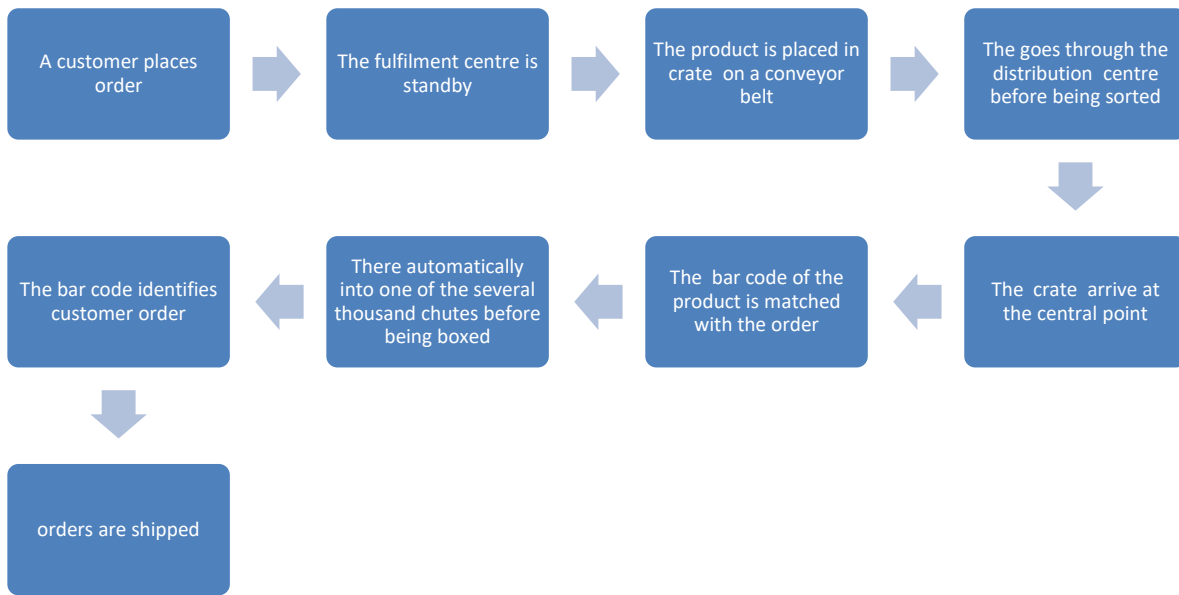


Fig 1:- SCM flow of amazon

There are six crucial elements that come into play for the logistics of supply chains in amazon

[i]. Warehousing
 This is a critical part of amazon supply chain. It has around 175 fulfillment centers across the globe. These fulfillment centers are very sophisticated inventory to meet the demand across the globe. In amazon efficiency is very important so to maximize efficiency it divided into 5 unique storage area.

[ii]. Delivery
 On time and fast delivery is one of the main focus of amazon.

Amazon offers a host of delivery options:

- Prime (1-2 hours, Same Day, One-Day and Two-Day Options)
- Hub & Locker Delivery
- Amazon Key (In-Home / In-Car / In-Garage Options)
- Amazon Scout Robot (Currently in test mode)
- Hub Counter with local retail partners
- Designated Day Delivery (to group orders together)
- No-Rush Shipping (6-day shipping with a discount incentive)
- Release Date Deliveries (Pre-order Option)

[iii]. Technology
 One of the main reason for the success of amazon is the lavish use of technology. Amazon extensively uses robots in it fulfillment centres for various activities. Right amazon drone delivery system is being tested for 30 minutes delivery

time. This would require an amazon landing mat and close distance to amazon delivery centres



Fig 2 :- process flow of amazon delivery services

Amazon seller
 There is a service called Amazon seller in which you can create an account on Amazon and sell your products on Amazon. This process requires four steps.

Step1:- create an account an Amazon seller central account in sell.amazon.com. There are two types of account you can make in Amazon seller account. Professional and individual account. Professional account will cost \$39.99 per month and \$0.99per item for individual account. Individual account is much more basic account

which lets you sell your own manufactured products but the professional account has benefits like fulfillment by Amazon, customize shipping rates, advertising, deals and coupon, automated pricing tools, Amazon sell coach, market place web services.

Step 2 :- The products must be listed on Amazon. you can either resell already existing products or sell your own products on Amazon. To sell a new product on Amazon you will need a product identifier that is a bar code – UPC, GTIN, ISBN or EAN.

STEP 3 :- The seller have to find a way to fulfill customer orders. They can use to fulfill their order. The customer using Amazon fulfillment by Amazon service will be given delivery, customer services, and distribution by Amazon. The customers selling on their own have to deliver return and distribute orders on their own.

Step4 :- Amazon will pay you on every 2 weeks of the month on eligible sales proceeds. The seller should become familiar with Amazon fee schedule.

2. Myntra

Myntra is an online shopping retailer selling fashion brands and casual life style products. It is

the retailer which popularized coupon. It is currently doing 8000 transactions daily and over 4 lakh visits and the network has expanded to over 1,200 towns and cities across India endorsing over 350 national and international brands. It is operational in 12 major cities and has a plan of serving over 70 of its customer via their own logistics.

Some of the facilities myntra provides.

- It offers 24 hours delivery in most cities and free shipping within India. It can also deliver internationally to all major countries.
- Myntra invest heavily on IT sector to have a good customer experience. Plus it has a good digital marketing strategy.
- As myntra deals with merchandising procurement is important for them. Finished goods received from various brands are stored at warehouses and then they delivered to the customers.

Myntra uses third party couriers to outbond their logistics. It is the company's responsibilities to the third party courier which will help it track its lead time and try and reduce it

The sourcing details of the company goes as follows

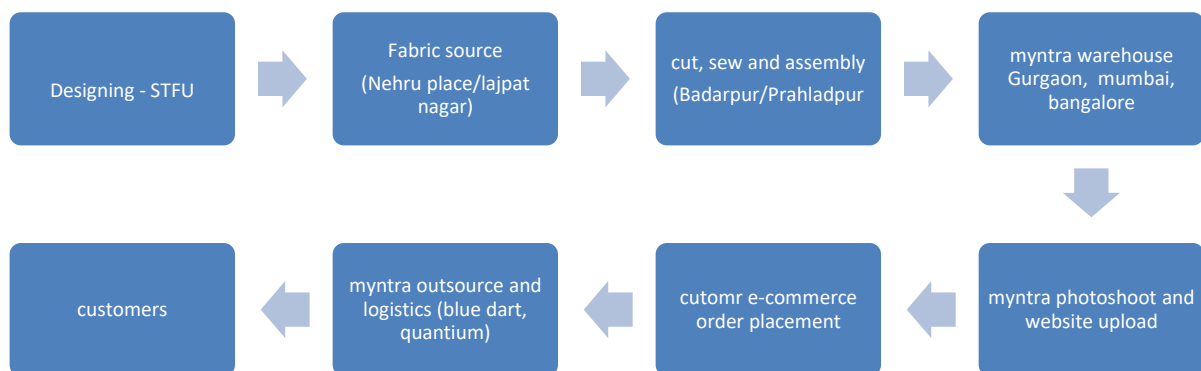


Fig 3:- Myntra supply chain flow chart

model.

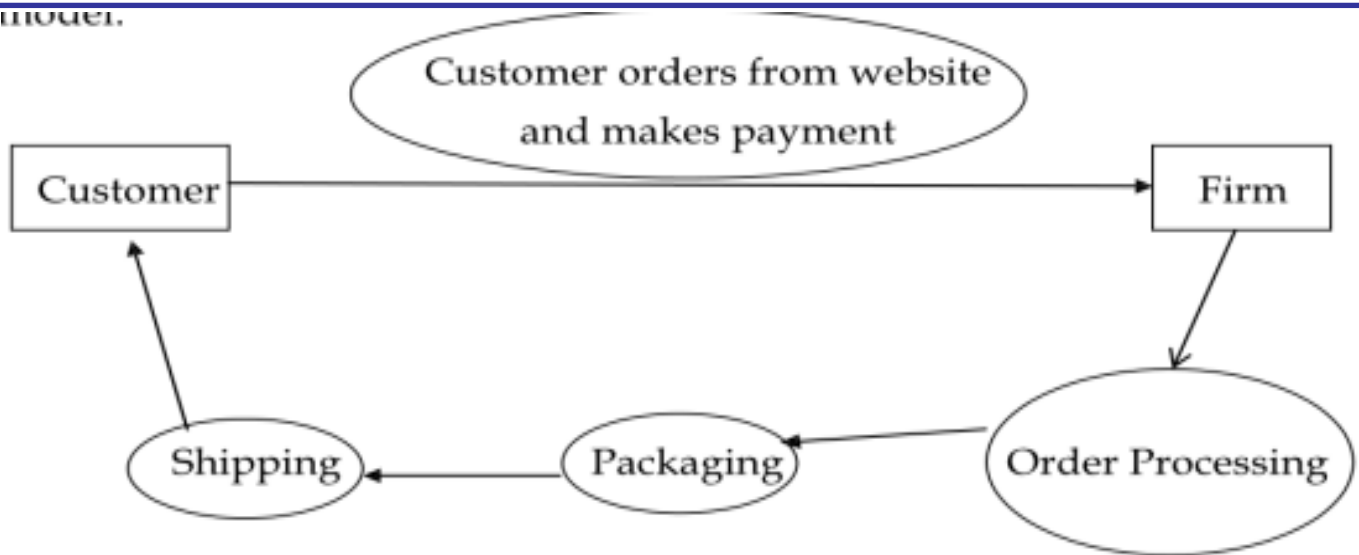


Fig 4:- Value chain analysis of myntra

3. Flipkart

Flipkart Advantage Shipment (FA)- available at flipkart fulfillment center

Non Flipkart Advantage- products ordered are available at marketplace sellers registered with flipkart.

ORDERS AT FA- After the order, the availability of the product is checked at the inventory.

Picklist with the detail of the product and its location is created and assigned to the associate. Product is packed as per the guidelines, the bill and label is pasted on the product

ORDERS AT NON-FA- the seller receives the order request and packs the product for shipment, first mile team leader creates a trip sheet and assigns a first mile field executive who goes to the seller location and verifies, picks and brings the shipment to the first mile team leader.

He bags the shipments as local, zonal, third party logistics, surface and national.

The shipments are transferred to the nearest mother hub. Mother hub receives the FA shipment from fulfillment centers and Non-FA shipments from first mile hubs, here the shipments are segregated into- Primary Segregation and Secondary Segregation.

Primary Segregation- the shipments are scanned and segregated on the basis of station basis .

Delivery Partner- Ekart

Station wise Dangerous Goods Same day and Next day Delivery(SDD AND NDD)

Secondary Segregation- the shipments are segregated on the basis of Destination Hub/COC code wise

1. NDD/SDD Normal shipments to respective DH
2. DG Shipments to respective MH
3. Third party logistic shipments according to vendors

Shipments are then scanned, weighed and sealed in white bags and stuck with bills and details these bags are then shipped to the line haul. It hands over the bag to the transport center team.

Shipments at Delivery hub- shipments are segregated and sorted in pin code wise or group wise. Arun sheet is generated and assigned to the FE, FE leaves the hub and visits customer premises for delivery, completes the payments transaction if any, updates the run sheet in the app and hands over the shipment

4. DHL (Dalsey, Hillblom & Lynn)

DHL is one of the world’s leading delivery, supplier, packaging and Logistics Company of the world. DHL supplies compressive logistics solutions. They have four units of businesses they are :- DHL Express, Blue Dart express, DHL global forwarding, DHL supply chain. Even though DHL doesn’t have an elaborate online site the reason we are studying the principles of supply chain of this company is because of its success and experience in establishing a global supply chain and logistics Excellency.

This will also make the retailer aware about the products and services retailers can use in order to take the help of DHL further for their businesses

Here we shall analyze various aspects of the company that make up the DHL supply chain.

[i]. The products and express that DHL provides.

- DHL document express:- The good which doesn't need to go through customs.
- DHL worldwide package express:- goods with commercial value that might go through customs inspection.
- Jumbo box and jumbo junior:- jumbo box is goods under 25 kg and jumbo junior is goods under 10kg. this services delivers goods anywhere in the world with one fee
- Import express:- This service allows you to import any goods around the world. It is a single window solution for delivery
- Fashion first:- this service is specialized for textile industry which need easy custom clearance and quicker delivery time
- Fast forward:- this is a service for transferring heavy goods 20kg or heavier. It has an online platform called trade automated service (TAS) which provides comprehensive trade and customs information of various country.
- DHL airlines:- it provides airlines services with different bases around the world.

[ii]. Intergraded logistics

There is a flow of ownership of the goods from finished product to customer which involves a lot of intermediate flow. This is made success with proper inventory flow and information flow.

- Inventory flow:- it involves distribution and procurement. The goods are weight and checked for condition and depending on the type of delivery it is packed
- Information flow:- there has to be a good information flow of the packages in its flow of inventory. There are two major types of information flow DHL operates :-
Coordinate flow:- they try to match the location of the customer with the products and services to be performed and the estimated time it will require.
Operation flow:- this involves directing various operation from a centralized flow of information. Operational flow deals with order management, order processing, distribution operation, inventory management, transportation and shipping, procurement.
- Forecasting:- based on years of experience historical data about the time required and the operations performed forecasting is done.

[iii]. Supply chain

DHL manages an international supply chain. The characteristics of its supply chain is such that it give clear picture to an upstream supply chain for faster decision making, the supply chain is more flexible which reduces lead time and inventory cost.

[iv]. Logistics services offered by DHL

- Reverse logistics:- this service helps customers plan , implement and control the flow of materials and information for the best possible outcome for their businesses. It involves installation of finished products in customer site, managing products on return, exchange of products.
- Service logistics:- this service involves replacement part delivery to and from customer according to the conditions given in the warranty.
- Inbound manufacturing:- this is a complete end to end logistics service for the purpose of management of inventory and labor to facilitate flow of material.
- Distribution to store management:- this service helps in creating adaptable supply chain.

Extended supply chain services

DHL provides other supply chain services

- Order management
- Call centre management
- Global inventory management
- Consolidated billing service
- Freight and customs services

They also provide quality management and product management services.

DHL solutions:- they provide logistics and supply chain solutions for a whole network. It involves all the process from counseling and planning to administration and execution. This is for different retailers.

DHL supply chain corporate information solution:- this provides warehouse and transportation services along with whole supply chain for clients.

[v]. Warehouse infrastructure network

DHL provides completely integrated warehousing facilities with wide supply chain.

- There are multi-user centers which provide a network of multi-user warehouse
- There are strategic part centers (SPC) Offering 1,2 and 4 hour fulfillment time.
- There are express logistics centre (ELC) which offers order processing, out source repair facility, custom find assembly, knitting services.

[vi]. Warehousing solutions of DHL

Warehouse management system (WMS) :- this manages all the records, actions, receipt and all other things that are required for the functioning of the warehouse.

Strategic inventory management (SIM):- this is a solution create specially for urgent or faster orders within 2 or 4 hours.

Direct express inventory management (DEI):- This is a solution for customer so they can centralize their stocks in one warehouse and use express delivery components the next day.

Repair inventory management (RPI):- they provide a solution for the return, repair of the broken parts and moving them in and out of warehouse

Inventory optimization:- it basically focuses on the following things for the management of its industries :-

- Supplier management
- Expenditing
- Order replenishment
- Demand forecasting
- Safety stock setting
- Order pipeline monitoring
- Execess stock management

They use specialized softwares to carry out the above function

5. Assam Bio Refinery Private Limited (ABRPL)

ABRPL is in a joint venture with Numaligargh Refinery Limited, Chempolis OY and Fortum from Finland. This company aims to reduce the dependency on fossil fuel. So in order to produce petroleum there is a need of ethanol which is also a part of crude oil. As we know one of the biggest expenditure of the country is the importation of crude oil. Therefore this company aims to produce bio-ethanol, acetic acid and furfural alcohol from bamboo biomass. Bamboo is a product which naturally grows in states like Assam, Nagaland, Arunachal Pradesh and Meghalaya. So here is an example of a supply chain that

ABRPL is trying to establish with the help of local growers which will uplift the community of local farmers with help of a good app based supply chain. This will save millions of rupees and could potentially lower fuel price.

The stakeholders in this business are:

- a) Bamboo grower
- b) Harvesting and Interim Transporters
- c) Local Level Entrepreneurs (LLE) for chipping bamboo
- d) Transporter

[i]. Vendor registration system

Since the whole process is app based and to maintain the supply chain it is important to register all the bamboo growers, harvesters, LLE and transporter in the system.

There are different ways different vendors can register

- a. Bamboo grower
 - They can visit the nearest ABRPL authorized store with required documents
 - Through an app or website
 - Through kioks put up by ABRPL
- b. LLE
 - The responsibility of registration of LLE lies with ABRPL supply chain
 - They have to visit the nearest ABRPL authorized store with required documents.
 - The responsibility of registration of transporter lies with ABRPL supply chain
 - They have to visit the nearest ABRPL authorized store with required documents.
- c. Harvesting group cum interim transporters
 - The responsibility of registration of transporter lies with ABRPL supply chain
 - They have to visit the nearest ABRPL authorized store with required documents.

All these vendors will have to fill a form filling in required details and produce the required documents. Then a 10 digit alpha numeric code will be generated which will be specific to the vendor. They all will follow a specific protocol while verification.



Fig 5:- registration process

[ii]. Materials requirements planning

- ABRPL will have 14 days of chipped bamboo inventory in-house.
- Since ABRPL supply chain is Supply Constraint, material requirement planning will be done based on the plant production. There has to be good amount of information sharing between ABRPL and LLE. 3 months tentative demand must be shared at the fourth week of each month. The requirements are calculated based on minimum dispatch quantity of chip, bamboo cost, transportation cost and inventory visibility.

plan, in-house inventory and in-transit inventory

- Below the flow chart of material planning is given

There also has to information sharing between ABRPL and bamboo growers . the communication can take place with the help of the app. They need to confirm the supply mode.

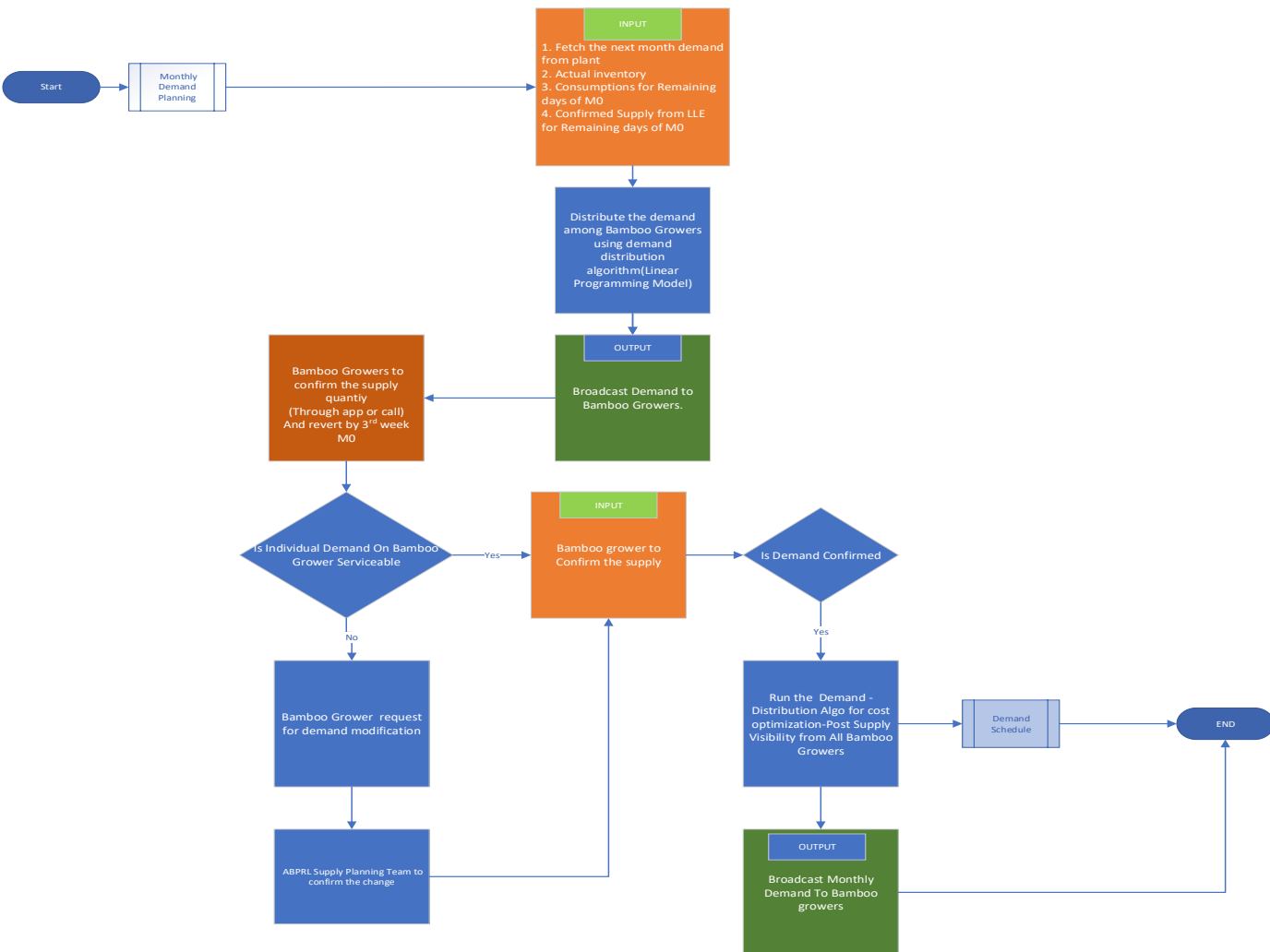


Fig 6:- Material management flow chart

[iii]. scheduling

a. Between ABRPL and LLE

Here weekly delivery plan has to be shared with LLE with delivery date which will depend on the frequency of material supply. LLE can confirm, reject propose within 2 days. On reaching ABRPL they will confirm the moisture content.

b. Between LLE and farmer

Material delivery can take place by collection through various harvesting group designed by LLE or a simple delivery to ABRPL. The delivery quantity, transporter will be confirmed by ABRPL, they would be informed by a call and text. Material will be received with sipping id and bamboo grower id. On reaching LLE

they shall confirm the moisture and weight and GR will be generated.

c. Bamboo growers and harvesting group

The harvesting group will confirm and pickup the harvest as and when directed by ABRPL. They shall feed all the information to the system. It will be confirmed by the bamboo growers ABRPL with information related to the weight and moisture content.

d. Direct supply to bamboo grower to ABRPL

It is possible for the bamboo growers to directly supply to ABRPL in the case of adversities. They have to request in the portal and on survey of the weight and moisture the bamboos will be accepted. GR receipt will be produced in the ABRPL gate.

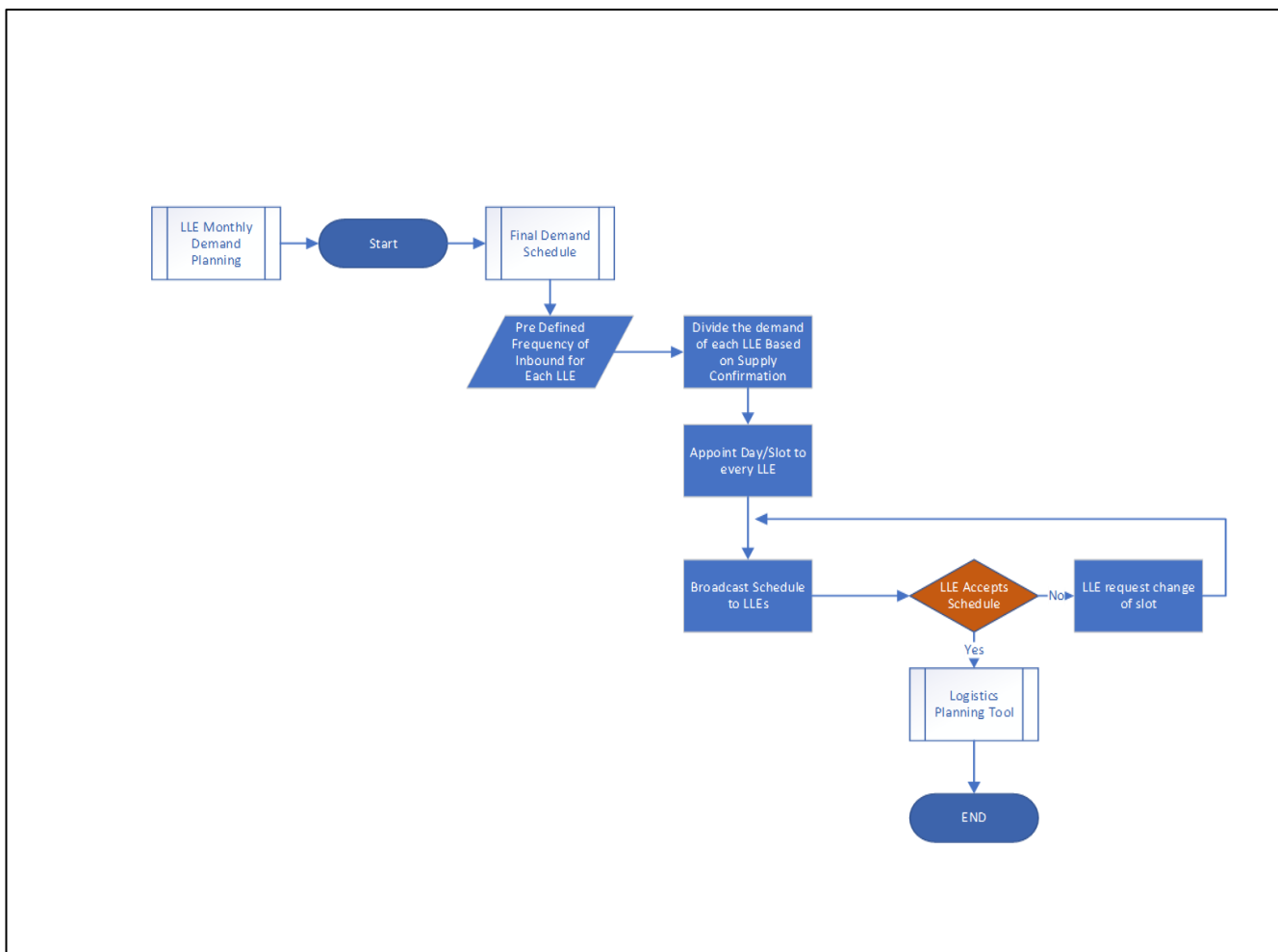
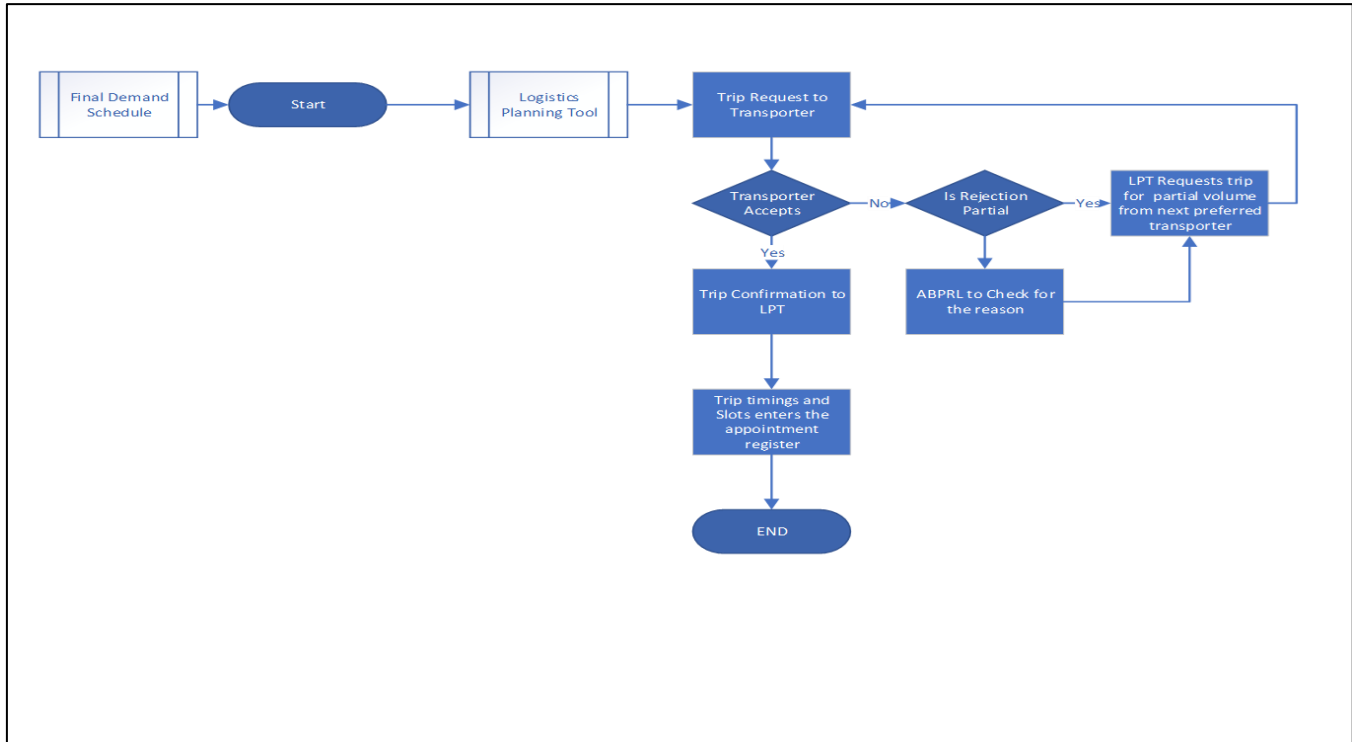


Fig 6:- Scheduling flow chart

[iv]. Logistics management
 a. Business distribution strategy will be done by ABRPL and the availability of the fleet, selection of transporter based on the agreed cost
 A database has to be maintained of the transporter route wise and with settled rates. ABRPL will be deciding the business distribution for the individual

routes. The selection of the transporter will be based on the rates and business distribution. Based on the weekly plan of the LLE, notification will be sent to the respective transporter. If the transporter accepts the request the shipping id will be shared to the LLE. If it is rejected it will be sent to the next preferred transporter.



b. Uber like model between routes where the fleet availability and demand is high
 An uber like app has to be developed showing the available transporter and once accepted it can be tracked using GPS and the available transporter is seen on the near vicinity. The trip will go to the transporter with the cheapest rates. If the transporter rejects it will go to the next nearest transporter.

c. Online bidding for selected routes
 There has to be a platform where the routes can be made available for bidding by ABRPL.

Transporter can get route information and submit the bid

[v]. material management at LLE
 The harvest group will deliver the raw bamboo then they are weighted along with their shipping id and vendor code. Then they will be allotted a batch number pertaining to that day. Moisture content will be recorded and then FIFO will be maintained while chipping. Then the data will be stored by ABRPL against delivery id and respective LLE

[vi]. Payment system
 All payments has to be direct bank to bank transfer into designated account of ABRPL.

- Bamboo grower
 Payment will be provided in credit cycle by ABRPL. The weight and the moisture content will be recorded by video analytics. Payment will be paid as royalty component. The cost and rates will be decided by ABRPL. The bamboo growers will visit the bamboo growers as per schedule calculate the weight and moisture content and update it in the app.
 Weightment can also be done by LLE. Here all the weight should be taken by weightbridge and the data should be entered in the system.
- LLE
 Payment has to be provided within 7 days. System should have penalty and incentives. ABRPL should have the flexibility to change the payment cycles. The cost will depend on the processing cost agreed by ABRPL.

- Harvesting cum interim harvesting group
The payment will be processed in 7 days. The cost will be based on the harvesting cost and transportation cost.
- Transporter
The payment should be made within 7 days. The payment will be based on the video analytics made by the weighbridge. The rates will be fixed before hand.

III. RESULT

Our main objective of our research is to help the other retailers if they are willing to start e-retailing or if they wanted to get their products online and how to take help or establish a supply chain strategy which is going to aid or help in their business. In this paper we first search through the various kinds of retailers and markets existing in India. Then went through companies like myntra, Amazon, flipkart, DHL and ABRPL to take an example of how the supply chain works out for different companies. As a result we shall analyze the different supply chain strategies and try to bring out the best possible solutions for different businesses.

- Become a seller in Amazon. Amazon provides all the required facilities to sell products online, which is going to take care most of the supply chain needs if you a small retailer and creating and maintaining supply chain is not manageable by the retailer.
- If a retailer wants to outsource their supply chain they can refer to DHL supply chain which has excellent services in their supply chain which retailers can make use of to aid their business.
- The secret to the success of Amazon is the very sophisticated fulfillment centers. They have state of the art facilities in these fulfillment centers. They sort and distribute more a million packages per year. The use of robotic shelves, distribution tray. Their whole supply chain is customer focused which is one of the main reasons why it succeeded.
- The customer centric approach adopted by Amazon is one of their main reason why they succeeded. The question one should ask is why the customers would prefer shopping online. The answer will be cheaper price and less of hassle to go and shop outside. It has also been surveyed that customer sometimes doesn't prefer shopping online is slower delivery time. To which Amazon made two different supply chain for 24 hours delivery and 2 hour delivery time.
- Faster delivery time can be achieved by strategically placing the warehouses and the fulfillment centers.
- Once listed as an Amazon seller small retail shops will be able to deliver item according to Amazon prime now delivery supply chain.

- The use of technology has aided the smooth running of supply chain. For example the use of robots in fulfillment centers of Amazon
- The most important thing to start a business online is to have a dynamic fulfillment centre. In the case of flipkart all the items from individual sellers move into fulfillment centers.
- DHL is one the oldest and most fully equipped logistics company in the world. A lot of companies outsource their logistics and supply chain needs to DHL. It also provides supply chain solutions for smaller businesses. In thus paper we have seen the products that are available in DHL from logistics to transportations to inventory management and all other supply chain needs.
- ABRPL is excellent example of how a government company created a supply chain to fulfill it need and also uplift the farmers with a product which is produced from a locally grown plant-bamboo.
- One of the characteristics that you see common in all the supply chains and even DHL stretches heavily on it proper flow of information. This ensures the management of information in the supply chain.
- For transportation the companies with largest capital keep their own vehicles. Other that owning your fleet it is also possible to outsource it. Companies like DHL provide those services. We can also follow the model designed by ABRPL where we can register the vehicles to the company and through an app based we can request for a drop if the vehicle rejects the proposal it will go to the next nearest transporter in tis way we can reduce the cost of outsourcing and buy your own fleet.

IV. CONCLUSION

As our final year b-tech project we tried to research the market and their problems with supply chain and the current scenario status. We have survey the supply chain strategies and of four different companies who is trying to establish e commerce in various ways and government company which is trying to uplift the community along with creating solutions for the market. We have also studied the products of DHL which is an world renowned supply chain and logistics company. Many companies have the products and services of DHL as their third party logistic company. All these research was done with one aim in our mind and that to provide solutions for business which are planning on venturing into the e-retail business to keep up with the ever changing times.

V. ACKNOWLEDGEMENT

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The project has made us more knowledgeable, and the value of the knowledge we received from the project is beyond the grades.

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