



KALINGA UNIVERSITY RAIPUR

Department of mathematics: MSc MATHEMATICS

Statistical analysis of flipkart supply chain analysis

SUPERVISION

by

MR. SATPAL PANIKA

RAJAN SAHU

Abstract: - The e-commerce business has gained momentum in the Indian markets. The popularity among the young generation to go for e-commerce has increased over a period of time because of the wide variety of products available at a very competitive price. Flipkart, Amazon, Snapdeal and many other have come up in the market and are able to sustain the local retailers because of the wide variety that they offer in the online stores. The biggest challenge of the online stores is managing their supply at distinct location and making it available to the consumer within the committed period. All this requires a strong supply chain management system in place. The research paper deals with developing an understanding of supply chain management system of ecommerce business with special reference to Flipkart.

Keywords: - Supply Chain Management, Consumer, E-commerce, Flipkart.

Introduction The concept of e-commerce is accepted very rapidly by the Indian consumer. The biggest drivers for online shopping are shortage of time, availability of a variety of products at a very competitive prices and retailers facing challenge in accommodating variety of stock for the consumers, thus prompting them to resort to e-retailers. A quick overview of India's Internet penetration shows a user base of approximately 692.0 million rounding nearly to **48.7** of the population. The spread, and subsequent adoption of e-commerce, thus, only seems logical. With several reputed brick-and-mortar retailers also offering online services, it seems natural the trend of shopping remotely will scale up substantially. As there is competitive environment in this sector, online retailers try to provide various services such as flexible payment methods, warranties for electronic goods and free home delivery with very competitive prices.

Objectives of the study:

1. To know about the growth of the online businesses.
2. To understand the inventory management system by online retailers.
3. To understand the relation between efficient supply chain management and pricing of the product leading to increased turnover and margin.

Methodology: - The methodology adopted to study the objectives of the research is the case study method which is based on secondary data collected through various books, journals and internet.

Scope of the Study: The method adopted is the case study method. The company selected is Flipkart which will help the new business man to understand the importance and development of efficient supply chain management for successful business. The case study also intends to highlight how the low inventory cost leads to low price.

Limitation of the study: - The conclusion will be based only on the research of single online store, hence the conclusion drawn cannot be generalise to all the online retailers. More over in the global competitive and dynamic market it is always necessary to identify different strategies to lead a successful business of which supply chain management system is only one factor. Researcher can identify different factors on which the sustainability and growth of the business is dependent on. History of Flipkart was founded in 2007 by Sachin Bansal and Binny Bansal, both alumni of the Indian Institute of Technology Delhi. They worked for Amazon.com, and left to create their new company incorporated in October 2007 as Flipkart Online Services Pvt. Ltd. The first product they sold was the book Leaving Microsoft to Change the World to a customer from Hyderabad. Flipkart now employs more than 30 ,000 people. Flipkart allows payment methods such as cash on delivery, Pay later, credit or debit card transactions, net banking, e-gift voucher and card swipe on delivery. After failure of its 2014 Big Billion Sale, Flipkart recently completed the second edition of Big Billion Sale held between 13 and 17 October where it is reported that they saw a business turnover of \$300 million in gross merchandise volume. Supply Chain Management of Flipkart the company structure of Flipkart is divided into three broad categories. First is Product and Technology which is the core team of the company, second is Business Development which is related to sales and third is Operations which deals with the supply chain management of the company.

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

Product and Technology Team: - The product and technology team is the core strength of the company. The team manage the entire process right from listing of item to search engine optimization to maintenance of website.

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. Bn

Logistics: - Logistics is one of the most important facets of any successful ecommerce venture. Flipkart ships more than 100000 items a day which makes management of the logistic 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 known as „eKart“ (EKL).

The e-commerce company created eKart as a separate brand to serve WS- Retail, the B2C side of Flipkart, in April 2013 and currently reaches consumers in about 1800 cities. eKart currently offers services such as delivery logistics, reverse logistics, net banking and pay on delivery. It also offers customer support and technology integration for order tracking, customer notifications, reporting and analysis, billing etc. In March 2014, Flipkart began to deliver packages for its competitors, as the company's logistics arm; eKart Logistics opens services for other e-tail ventures. While more than 90% of the Cash on delivery (COD) shipments and about 60-70% of the overall shipments are delivered by the EKL 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 EKL. In case of EKL, 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 couriers 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. Developing its in-house logistics has helped Flipkart save commissions“ worth than 2% that would have been otherwise paid to courier firms. It is also easily able to accept cash on delivery, which make up about 60 percent of its orders. It can also track packages more

accurately. And because labour costs are relatively low in India, its delivery cost is a modest ₹65 a package. 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. EKL is presently available in major tier 2 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 EKL primarily because of the higher delivery time. Moreover, India Post orders are of prepaid nature only. The delivery time varies between 1 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 1 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.

Reverse logistics / returns processing the returns for Flipkart are 2.6%. It follows a 30-day return policy. This policy which is primarily aimed to build trust with the consumers, has led to many customers duping Flipkart. For example, there have been several incidents when a customer buys a book only to read it and then return it within 30 days. Similar incidents have been observed with mobile phones as well. Flipkart, through its data management systems, has tried to identify such frauds. Return of a product to Flipkart can happen if the 3rd party cannot deliver to the address or the customer does not accept the product. Some orders are cancelled while the delivery is being processed by the courier company. Such orders are not recalled but delivered to the address and then cancelled. Customers can call the customer support and courier back the product to Flipkart. The delivery cost is borne by Flipkart.

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

1. Replacement: - Flipkart returns the product to the supplier and obtains a replacement that is delivered to the customer.
2. Store credit: - If the customer is not satisfied with the product, he or she is given store credit of the same amount.
3. Actual cash: - back: Given out as cash for cash-on-delivery payment or refunded for online payment.
4. pay later: - This Pay Later option is a small-ticket loan that permits offline and online purchases when making instant payments

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. Later this was discontinued and inventory was purchased to ensure superior delivery times and customer satisfaction. But with foreign direct investment (FDI) favouring the marketplace model in April 2013, Flipkart changed its business model to marketplace model. With a marketplace model, Flipkart no longer has an inventory of its own, rather buyers can deal with sellers directly and the delivery will be done by Flipkart. The model is similar to eBay India and Amazon.in At present, the entire inventory of Flipkart is being managed by WS Retail which is flipkart's pet project. While WS Retail will continue to be one of the sellers, Flipkart has added more than 45% sellers to its list.

Procurement of items could be for: -

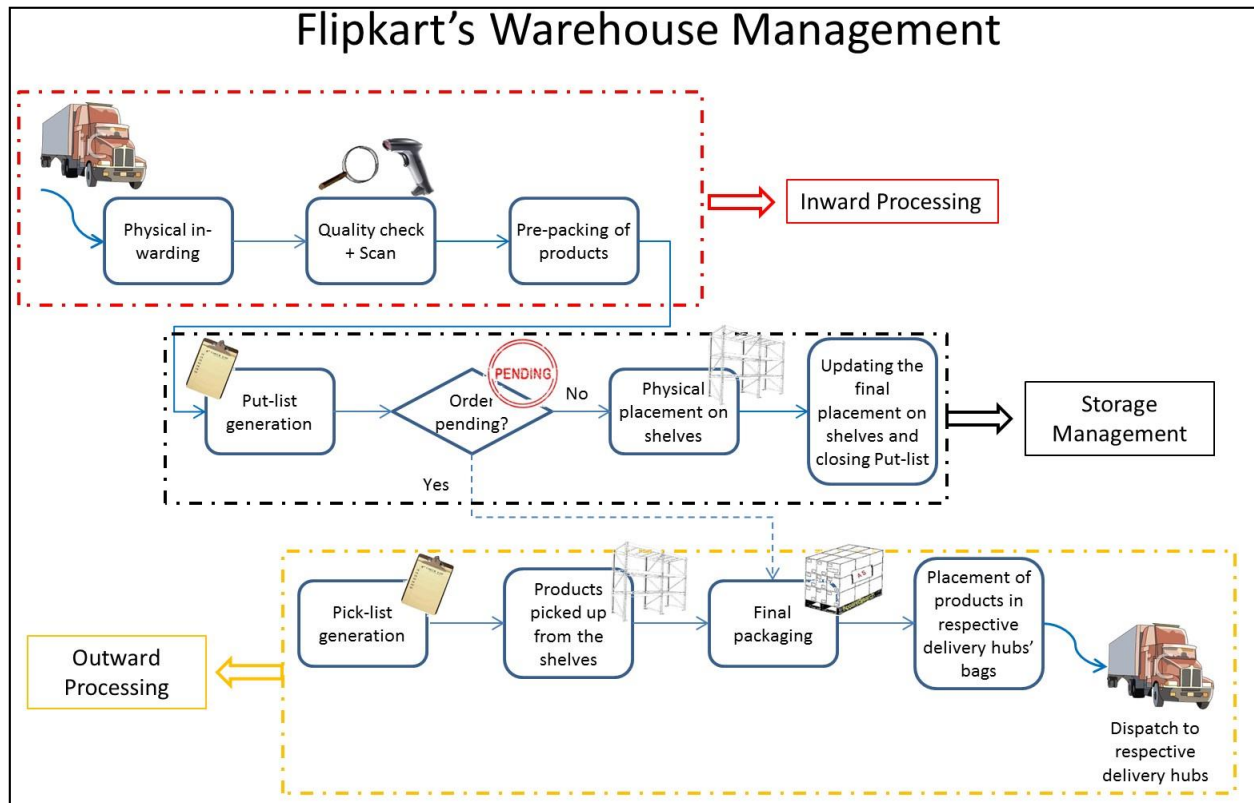
Inventory: - These items are pre-ordered based on previous sales data to stock as inventory. This category includes items with relatively low demand elasticity, fast selling items and items with relatively long shelf life.

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. 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 realised. 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 maximise 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 rationalisation of product line and choosing one's customers.

Sourcing at Flipkart is conducted at two levels: - Regional: By Regional Procurement Teams 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.

Warehouse Management System: -



Flipkart has 7 major warehouses spread across the country flipkart has added 66 new large-scale fulfilment 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 the some of the details regarding each of the sub-processes involved in the WMS

Inward Processing

Physical in awarding: - This is the area where physical delivery of goods from suppliers to the warehouse is taken.

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.

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

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 placement of products on shelves. This is called Put-list generation, which marks the place where the respective items need to be put.

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.

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.

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

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

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.

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.

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.

Issues 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 systems 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

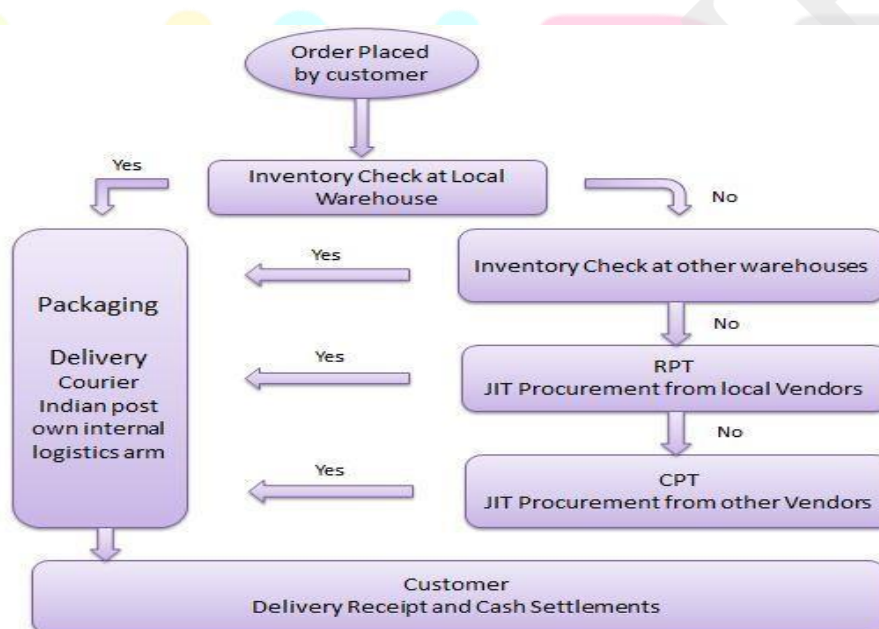
Flipkart uses its own ERP systems to process orders and track the details of all the transactions that need to be carried out. A typical order at Flipkart starts with the customer searching, selecting the required item and placing the order. This on an average takes around 8-10 clicks to

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). Flipkart launched its payments brand called Pay Zippy in July 2013 to provide safe and hassle-free payment option to its customers and online merchants.

Order Fulfillment

Customer orders are fulfilled either via Inventory or JIT procurement depending upon the



availability of the products.

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. 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 labelled 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/servicecenter. Flipkart varies between one day guaranteed delivery and three weeks depending on location and availability of product.

Inventory Management

The inventory stocks are replenished whenever it goes below Reorder point. 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 ad hoc 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 off 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:

It helps them to get better deals from the bigger manufacturers if they can order in larger quantities frequently enough.

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 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: -

Price considerations: – As mentioned before – credit lines and discount terms play an important part in selecting suppliers.

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.

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 customer loyalty.

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:

-Sales Assistance

General Enquiries Product/Shipping related enquiry

One of the major reasons for these calls is Indian consumers 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:

Pro-actively inform customers about any delay in deliveries.

Pro-actively check the status of refunds or returns.

Inform the user in case any delivery has not been successful due to the customer not being 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.

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 Pay Zippy 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.

References

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