

Group- 10

Analysing Dell Inc.'s Adoption of Just-in-Time
Manufacturing.

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Summary

This report we have depicted detailly about how the organisation which we choose (which is Dell Inc) has implemented JIT model in their organisations. This report also illustrates the necessity of JIT in the firm, JIT elements that the firm has used with explanation, before and after the implementation of JIT method, pros, and cons of the JIT method in firm, and issues across the firm due to external factors like COVID-19 in the JIT method.

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CHAPTER 1:

Name of the Product:

We have selected the DELL Inc. to proceed our project. In this report our team have defined how Dell Inc have implemented the JIT system.

Product:

Our team have specifically selected monitor from the DELL Inc product to pursue with this report.

CHAPTER 2: Necessity of Implementing JIT in DELL Inc:

Dell Inc. was started in 1984 by Michael Dell. Since from 1984, Dell Inc had evolved dramatically in providing computing solution to its consumers. The main ideology of dell is to understand the requirement of consumers and provide it with a tailored computing solution in more efficiently. Despite the successful growth, Dell has faced fall in the market due to competitor organisations like Acer Inc, HP Technologies, Lenovo Inc, Apple Inc, and other organizations and it made the Dell Inc to implement the JIT systems.

Though Dell has a dominance among the large number of corporate users, it had faced a forced fall behind in market by the rival company Acer Inc which offered low-cost net books and computers at a reducing operating margin. Moreover, the rivalry got more intense by the other competitors, which caused Dell to reduce its vast global network suppliers. As a result, dell had to enter new global market like China, which now had to face the competitors from both domestic and overseas like Sony, Lenovo, HP, Apple, and other organisations. Moreover, many firms were so predominant in replicating Dell strategies. Peculiarly, Lenovo was poaching many managers and staff from Dell and had taken a great effort to replicate Dell's strategies.

Therefore, to tackle this prevailing competition, Dell has updated its existing strategy with implementing Just in Time system (JIT system) in its firm. Even after implementing the JIT system, firms have tried to imitate its strategy, yet enterprises end up unsuccessful. Dell has tailored its JIT system very thoughtful and has integrated a very good supplier integration. This implementation of JIT system had favoured Dell to concise the inventory cost and to minimise the lead time in serving the customers' orders.

Even still, Lenovo had still tried to replicate strategies like direct business model and supply chain management system from Dell. Neither like other manufacturers, Lenovo doesn't imitate the strategies but, it was focused on learning the advanced supply chain management system, this result Lenovo to configure huger areas of development. In result Lenovo has dramatically reduced the lead time and the level of inventory control. Despite learning the strategy of Dell, still Lenovo couldn't use the strategies successful than the DELL. The inventory hours of Dell had remained 18 days lesser than Lenovo with 90% of higher efficiency.

After a result of incorporating JIT system like linear manufacturing, vendor managed inventories, demand or pull scheduling, outsourcing to manufacturers in countries like Taiwan, where these manufactures have strong manufacturing capabilities, and which can manufacture at competitive prices. Therefore, Dell Inc has pioneered the Just in Time and had gained very successful productions in the global market.

CHAPTER 3: Five elements of JIT implemented at DELL Inc:

Dell Inc is known to be the first computer hardware company to implement the Just in Time model. It has known to be a pioneer in JIT system by its own JIT element strategies. Some of the successful JIT elements used by Dell Inc are:

- **Direct Sales Model:**

This direct model method is used by dell which annihilate the intermediaries and delas direct to the customers through internet, telephone, face-to-face interactions.

- **Built to Order:**

Dell Inc have implemented JIT element called build to order, which allows the customer to customise the requirements of the device and place order through internet or calling to a toll-free number and their product will be delivered directly to the customer. This reduces the inventory costs, retail locations and can increase the sales.

- **Vendor Managed Inventory:**

It is collaborative inventory management between buyer and seller, to optimise the availability of products at a minimal cost. Once an order is placed, it is processed and tested, and packed.

- **Push and Pull Strategy:**

The push strategy means the manufacture produces their products maximum and let the dealers to sell it. The pull strategy means the customer places the order according to the requirements and the manufactures produces the product according to the demand and delivers it to the customer.

- **Cash on hand:**

In this method the deposited amount or paper bills from a firm bank account is converted into cash in short period of time which increases the organisations cash flow efficiency.

CHAPTER 4: Explain how each element works:

Direct sales model:

Dell Inc uses direct sales model to sell their products directly to the customer without any intermediaries. The customer can contact Dell Inc directly through internet, phone, or face-to-face and orders the product with customized specification. After placing the order, Dell Inc delivers directly to the customer without any mediator. This improves the firms profit and customer satisfaction.

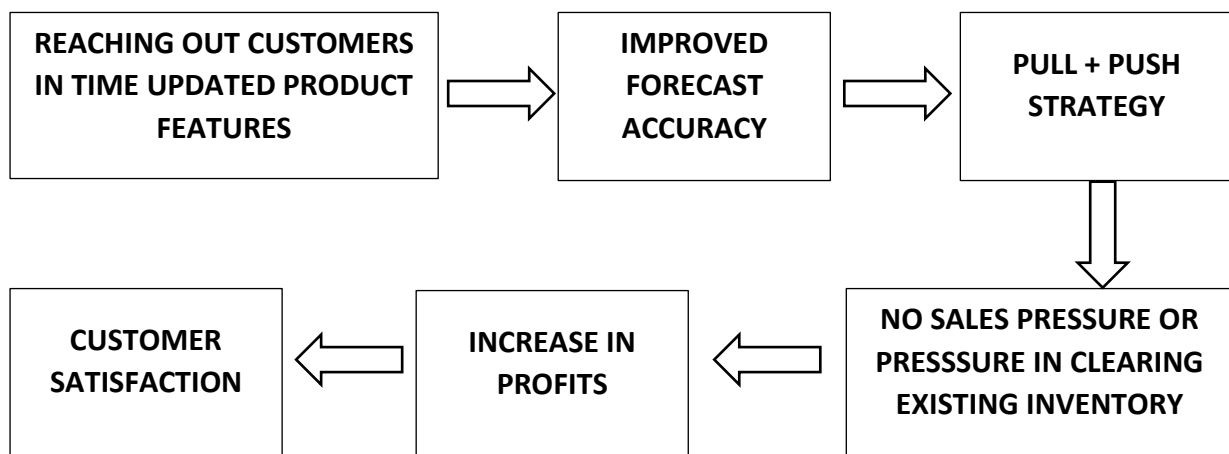


Figure 01: Direct Sales Model Procedure

Built to order:

With the build to order JIT element the firm Dell Inc reduces the inventory cost and labour cost. The product won't be manufactured unless a customer places a product order. The customer can directly contact dell through toll free number or internet and can place the order with the customised requirement. Then, Dell Inc manufactures the product according to the customers demand, then the product is tested. After the inspecting the ordered product, it is then delivered to the customer. This JIT model reduces the inventory cost and labour costs of Dell Inc.

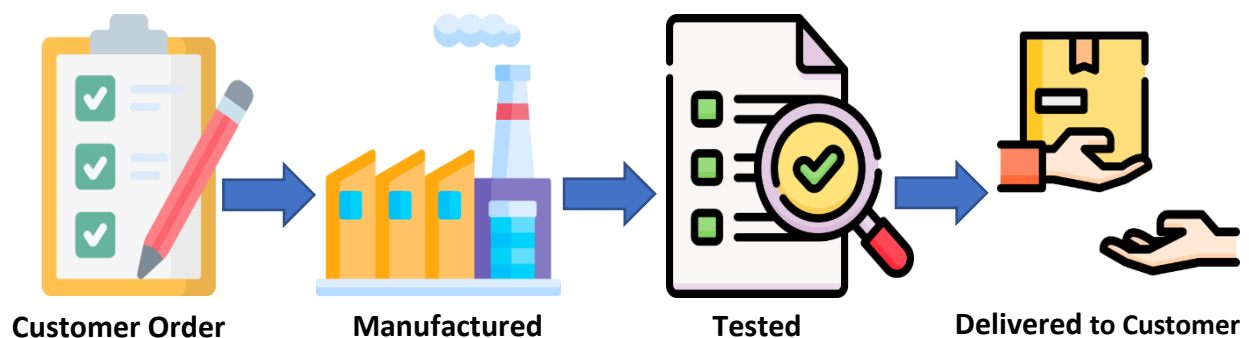


Figure 02: Build to Order Procedure

Push-Pull method:

To limit inventory level and offers unmatched pricing to customer for customised product, dell focuses more on push-pull strategy. With the push strategy the products are manufactured and had done promotional campaign which pushes the product to sale to the customer. Whereas the Pull strategy the firm receives the order from the customer and product is manufactured and sale it to the customer. Dell holds the core product in warehouse and waiting for the customers requirement to assemble them.

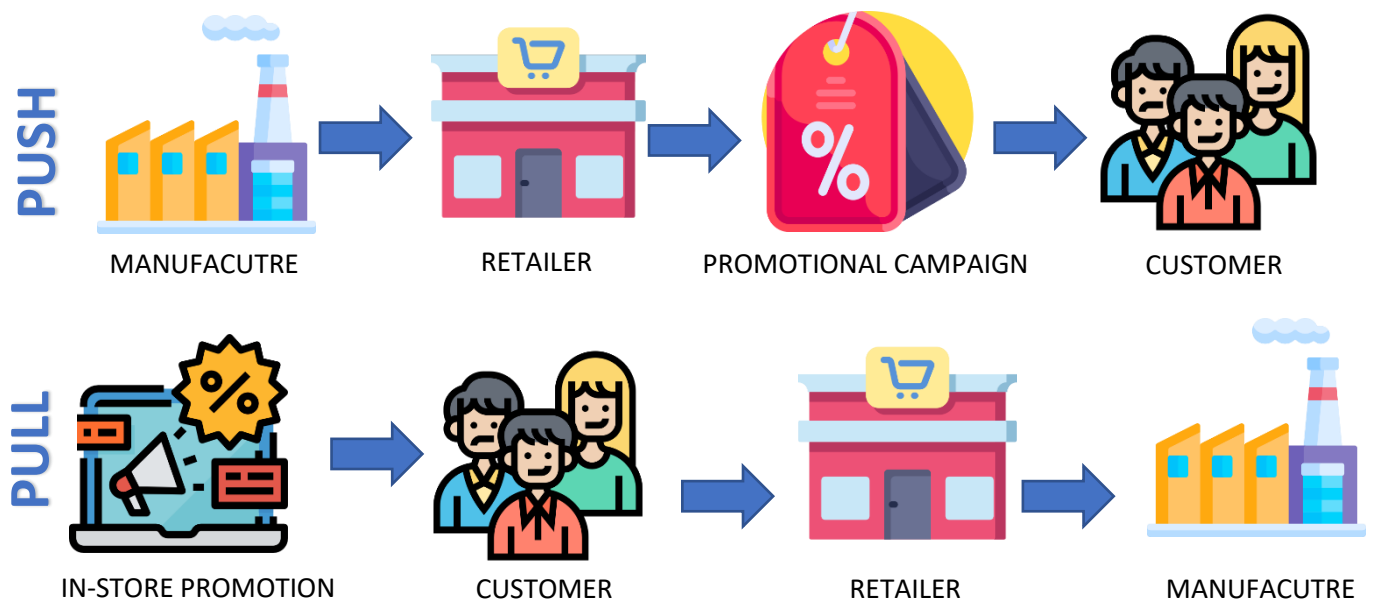


Figure 03: Push and Pull Model Procedure

Vendor Managed Inventory:

It is collaborative inventory management between buyer and seller, to optimise the availability of products at a minimal cost. Once an order is placed, it is processed and tested, and packed within 8 hours in Austin, Texas. Most of the suppliers are from southeast Asia and their shipping time to Austin ranges from 7 to 30 days, to reduce this lead time, suppliers will send parts to revolving inventory management two to three times in a week maintained by them which are few miles from Dell's assembly plant.

Cash on Hand:

Dell Inc uses the cash on hand element well, which makes the Dell Inc a cash-rich company. Dell Inc converts the credits into cash within third day of the transaction period. When a customer purchases a product from Dell, the transaction can be done through paper bills or credit/debit cards payment this credit in the account is then converted into cash.

CHAPTER 5: Before and after the implementation of the JIT elements:

Before implementing Just in time production technique, the cost and time required for production was high. The total time required for production is high because the production was not streamlined and too many complications in attaining the outputs. Since the time taken for production increased the cost involved in production also increased in this case.

Production Time:

After Just in time implementation the production time decreased which has increased the total production which increased the profit of organization by reducing the total cost involved in production. The cost includes the inventory cost required for storing the material until it is assembled completely and time in production spent decreased which has reduced the total working hours of production unit leads to cost savings.

Lead Time:

Commitment to customer regarding the lead time was not accurate before implementing the just in time production since the process flow was not streamlined and there are too many parts to be manufactured in same line which increases the setup time for production of certain parts.

YEARS	Q1	Q2	Q3	Q4	TOTAL
2012	4.9	4.97	4.82	4.67	19.36
2013	4.45	5.01	4.85	4.97	19.28
2014	5.03	5.01	5.09	5.16	20.29
2015	4.65	5.03	5.01	5.16	19.85
2016	4.93	5.22	5.31	5.44	20.9
2017	5.4	5.57	6.01	6.13	23.11
2018	6.22	6.4	6.5	6.78	25.9
2019	6.3	6.4	6.48	7.24	26.42
2020	6.7	6.37	6.36	7.69	27.12
2021	7.06	7.55	7.67	8.24	30.52

Table 01: Before and After Sales with Implementing JIT Elements
(Values are in Million)

Finished goods been delivered to customers in time which has improved the production efficiency and attained customer satisfaction in market. The company has only assembly units required for production since major components are outsourced from vendors. The setup time for assembling each product been reduced and the process flow been streamlined which attains the confidence of production team.

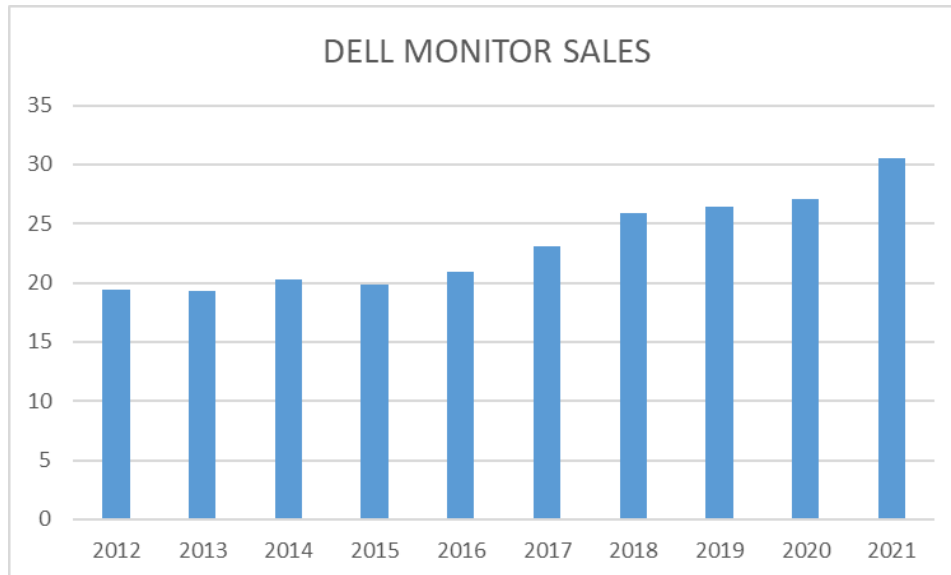


Figure 04: Dell Monitor Sales after Implementing JIT Elements

Just in time has not only improved the total production it has reduced the total cost which increased the profit it has reduced the total time required for production the total lead time in production been decreased. In this the management the production team, the vendor by paying in time and getting continuous stable orders and the end customer are satisfied.

Scrap and poor waste management:

Before implementing JIT technique, the shop floor was not maintained properly which leads to contamination of waste produced from production. The total output from production also reduced. The team must concentrate in too many parts production which has to be produced there was no focused segment and no room for continuous improvement.

Audits: Series of audits been conducted from Dell side to check their suppliers are following procedures to ensure sustainability also ensuring reducing the waste generated. The waste disposal also been checked from Dell side. In this case after covid Dell aggressively implemented these techniques by taking advantages of Covid restrictions to strengthen their internal system also improved their suppliers' standards. More than 90% of issues been identified and out of which 65% of issues been sorted. In this drive a total of 407 suppliers participated in this with 1616 participants. Dell also audited that whether their trainings and standard operating procedures are followed by suppliers which has improved their efficiency towards the sustainability commitment.

The scrap disposal and increase in scrap count during production was major concern since the production was taking care of each material required for monitor to be produced in house which has consumed resources were the team was not focused on any material production. The production team were limited with resources in terms of waste disposals were the E waste and other were not segregated and which has caused many issues. Now after implementing the Just in time production the total waste from production been reduced since the parts production takes place at supplier end the wastes been eliminated.

Material Testing and Research time:

Before implementing JIT, the time spent in each line for checking the quality of product produced and the time taken for that testing was high which has increased the total lead time for production. The research to implement the process and optimising the product features was major investment now after implementing JIT the total time invested in all these areas reduced since the vendor will take care of testing, research, and development.

Materials are outsourced from suppliers in this case cost and time for material testing is reduced. Also, the research and development investment in optimising certain product features been reduced since the suppliers taking care of these processes.

Utilisation of resources:

Manpower was not effectively utilised before Just in time production and the raw material and other available resources were not utilised since there was not process flow followed there are chances of wasting time and increased scrap from production occurred. Effective utilization of resources been attained which has improved the production capability and the cost of production is also reduced.

S.no	Before JIT Implementation	After JIT Implemented
1	High Defect from Production	Low Defect from production
2	Poor Waste Management	High Waste Management
3	It Takes High Lead Time for Production	The Lead Time is Reduced
4	It Takes High Production Time	The production Time is Reduced
5	The Cost of Inventory was High	The Inventory Cost is Reduced
6	The Efficiency of Work Hours was Less	The Work Efficiency Hours is High
7	The Cash Flow was very Low	The Cash Flow Became Very High

Table 02: Before and After Implementing JIT Elements

CHAPTER 6: Any benefits/ advantages of implementing JIT in DELL Inc:

Reduced/ Lower Costs:

The main advantage of implementing Just in Time manufacturing gives the result of reduced costs and it cut down the capital tied up in investing the stock so that the company can use that huge sum of money in different platforms such as marketing and advertising.

Reducing Lead Time:

Reduced Lead Time is one of the benefits of JIT implemented in Dell INC, this shows that the time required to full fill a customer order has been tremendously simplified, which has facilitated the efficient flow of goods.

Reduced Working Capital: The working capital for total production will be decreases which increases the profit of organization. Sometimes the company can also increase or decrease their product cost which helps them to attain competitive position in market.

Reduced Inventory Cost and Space:

Total cost for inventory been reduced since the space, investment in inventory, manpower and holding cost are reduced by implementing Just in time production. Since the materials are outsourced from vendors the vendors will take care of inventory and the total holding time of finished goods are reduced since the product production been considered only when there is demand. No excess production takes place.

Customer Satisfaction by meeting demand in time: Finished goods been dispatched immediately to customers. Since the production involves only assembly and major components required for production are from the suppliers the total time of production been reduced.

Multivendor sourcing:

The major draw of just in time production will be the vendor management when a supplier fails to deliver their product in time this affects the entire production unit. This could stop the assembly for long time which will disturb entire production and supply processes. The multivendor policy helps Dell to keep an alternate ready in time so that even a vendor fails to deliver his commitment there will be an immediate alternate which could restore the production with required materials. Dell has pioneered in this technique by maintaining many qualified vendors who could be able to meet demand at any given point of time when there is demand.

CHAPTER 7: Any issues or problems or disadvantages of implementing the JIT elements to your Dell Inc:

- More planning required JIT inventory management requires companies to anticipate seasonal sales and ensures suppliers can meet the demand.
- Excessive cash required to implement JIT and to control the process is difficult.
- A natural disaster could result in disruption of the supply chain which leads to loss of material and increase the lead time for production which increases the cost and time for production.
- Difficult to meet the sudden surge in customer demand since the production follows make-to-order and less inventory maintenance techniques.
- Dependency on suppliers for production leads to disturbances, sometimes there are chances of that supplier might face some issues which might affect the production.

CHAPTER 8: Any recommendations that you might have for the implementation of JIT in DELL Inc:

Even though Dell has nearly eliminated the inventory system, by implementing the JIT model, the inventory system can be useful at certain period. Since the demand in a market is unpredictable, the customer demand could suddenly rise. To tackle these issues the inventory system could be a solution.

Though the direct model strategy is a success for Dell, it can have some flaws. This strategy might be benefit for the customer who has the knowledge to order the product with the required specification. But for the customers who doesn't have the enough knowledge about how to choose and customize the specification cannot place the order which can become a flaw. If Dell provides a few authorised retail services stores, the customers can contact the retailer with face-to-face interaction and can get product with required demand.

Dell Inc is known to be a successful firm with JIT model, yet in the international market its market share is less when compared to it rivals like HP, Acer, and other manufacturers. It's because, dell has higher market value in the markets like United States of America and other markets, but when it comes to European market it values becomes less. It's the case because, Dell Inc had lack to diversify it products internationally. Moreover, when compared to the other manufacturers, products of Dell Inc lacks the quality in the European market. Dell could resolve this issue and regains its market in Europe by improving the JIT process and diversify it internationally. Moreover, it can provide service to accompany it products. Which can increase it market value in European markets as well.

CHAPTER 9: Any issues that arose with JIT practices within your selected organisation during the COVID-19 pandemic:

Government regulations and Lockdowns:

Pandemic affected many businesses Dell also faced closure of production facility and there are some losses of lives in their team. In addition to that there are closures of production facilities. After first wave once government lifted lockdown there were covid regulations in place to maintain social distance. During this time manufacturing facilities ran with half of human resources and with limited shifts because of strict regulations imposed by governments because of Covid.

Supplier Issues:

Materials required for production are not reached in time since major suppliers failed to meet their target because of working hours limitations and global outbreak of Covid. Many suppliers faced supply chain issues the goods transfer has been completely blocked by government to make a green channel for the medicines in many countries and the port and hubs were completely busy because of production took place at once from all the ends which has affected the assembling process. In this case there was series lock down one after other since the suppliers are from different countries the entire supply chain was affected during the outbreak.

Supply chain disturbance:

The total supply chain management was collapsed the materials imported from other countries were stuck at many places like at port, in containers while transporting by through road and some dispatches were stuck in warehouses of suppliers. Even after the port clearance there was complete demand in finding the vehicles to transport the goods and there were certain restrictions in terms of total working hours and total number of vehicles to be used.

Documentation Delay:

For local movement of goods and for the manpower many countries imposed a regulation for which the suppliers and manufacturers to spend lot of time in getting the approval from the government regarding the transportation. The port clearances were delayed because of documentation delays. Lot of documents been converted in electronic modes which made certain delay in validation of original documents and increased the approval time.

Cost and time of production:

The cost of production and time of production increased. Even the finished products delivery was disturbed by this time. Raw material shortage was faced by suppliers where the raw materials demand has increased because of supply chain issues. This has increased the base price of products. Also, the inventory cost for the finished goods from supplier's side increased which has ended in conflict between Dell and the suppliers. There was disturbance in assembly units as well since the outbreak production facilities were not running effectively which has increased the total production cost. The time to complete the products also increased because of delay in procurement and supply from both supplier and manufacturer side.

Effective usage of working hours among suppliers:

Suppliers faced an issue in utilizing the manpower since the working hours were reduced and covid protocol been followed during shifts there was certain delays in shop floor. Workers were instructed to use personal protective equipment and to follow certain Covid protocols which has disturbed the total working and the efficiency of working been reduced. The major challenge during Covid was to ensure the productivity with covid regulations which has influenced the workers mentally.

Manpower shortage:

After the outbreak there was attrition across the department there was labour shortages both from supplier side and from the production unit side. The manpower shortage from the manufacturer side was the major influencer to implement Just in time production in shop floor for Dell. The migrants from different countries were also turning back to their home locations which has influenced the production process.

Sudden increase in demand:

There was sudden increase in demand for the monitors since people started working from home and the office setup must be done at their personal spaces for which there was 7 to 10% increase in demand which was not in limits to meet the demand from both suppliers and manufacturer end.

Additional planning requirements:

Planning was totally collapsed from all the departments. The production plan was completely disturbed followed by the demand and supply plan. There was series of interruptions because of the outbreak. Covid protocols in production disturbed Dell there were many immediate purchases of safety equipment needs to be taken place which has added pressure to the management.

Alternate suppliers:

Many suppliers failed to supply in time for which company faced series issues also they were finding it difficult to find the alternate suppliers for the existing production since the material need special manufacturing set up also the trained human resources. Because of this there was delay in production. For any product there is series of research and development activities need to be carried to attain their accuracy and to ensure proper utilisation of resources. In this case Covid affected entire business which has resulted in halt of supply from some suppliers which has affected the business. During this time Dell faced series of challenges in finding out the new supplier also it was challenging to do audits also to onboard a supplier which has made finding alternate suppliers a difficult task.

CHAPTER 10: Issues affect the Dell Inc:

Material Shortage:

Dell faced material shortage issues at suppliers end which has disturbed their production. Due to which there was decrease in production output. In addition to it the shop floor was forced to maintain the inventory of unfinished goods. The cost of material also increased in many areas which has delayed the production. Other side there was sudden hike in procurement of raw materials by suppliers in panic which has also caused the delay in supplies. Above all many of these suppliers were running out of manpower to send those materials to their vendors. Dell struggled because of material shortage issues.

Supply chain issues:

Supply chain is always a challenge for any company because it is dependent on external factors which cannot be controlled. Situations like Covid makes it even worse were the companies struggled to mobilise their dispatched material which was struck on their way to different places across globe. The traffic in all three ways of transport was bad. The air traffic was less since many airlines announced their cancellations which has forced companies to go for road and sea ways. The Port clearance in many ports took time and there was increase in traffic because of increased inbound and outbound activities.

Increased Production Cost:

Production cost increased for monitor because of increase in operational costs for production. Because of delay in supplies and increase in man material and machinery cost the cost of production increased. Company faced short term losses during this time. Until the total production been restored the product cost was increasing over period. Due to increase in cost the capital investment required for production also increased during this time which has disturbed in management.

Competitor Benchmarking:

For any company competitor is threat for their market size also companies need to change their strategy and policies often to ensure that they are ahead of competitors in terms of launching new products to the markets. In this case there were series of update coming up from the competitors, but Dell took time in changing their product features which has affected business in some international markets.

Research and Development:

The Research and development activities been totally stopped for some time which has affected the product development processes. This is due to lack of resources because of which some unpredictable circumstances like Covid or earthquakes. Research and development are always a major concern since it predicts the future also it ensures the companies existence in a competitor market. Even the market is monopolistic it is always important to have a strong research and development source.

CHAPTER 11: How did DELL Inc adjust to these problems:

Dell able to utilise 60 hours of working time effectively to ensure their target it achieved, and they were successful in reducing the total defects from production.

In addition to it Just in time helped them in better understanding of market demand the cash in hand helped them with better cash flow were as the customer satisfaction in getting products with updated features specially manufactured for them helped DELL to gain market share globally.

Company optimising their production processes by implementing JIT elements in reducing lead time, better inventory management and better utilisation of resources for their products what they produce.

By better inventory management also by planning procurement based on present market demand the company saved their working capital and not much of exposure been taken which has helped them during COVID even there was lockdown the supplies of recent orders were struck.

Dell has invested in waste management to reduce the pollution and to dispose the generated waste which helped them to become sustainable. Also, by conducting series of audits at supplier place training them to practice sustainability which has boosted the confidence at both ends.

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