Supply Chain Logistics
of
PlayStation sales across United States

MIS 710 – Process Innovation & Management

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1 Overview

A Supply Chain is defined as the entire process of making and selling commercial goods, including every stage from the supply of materials and the manufacture of the goods through to their distribution and sale. Successfully managing supply chains is essential to any company hoping to compete.

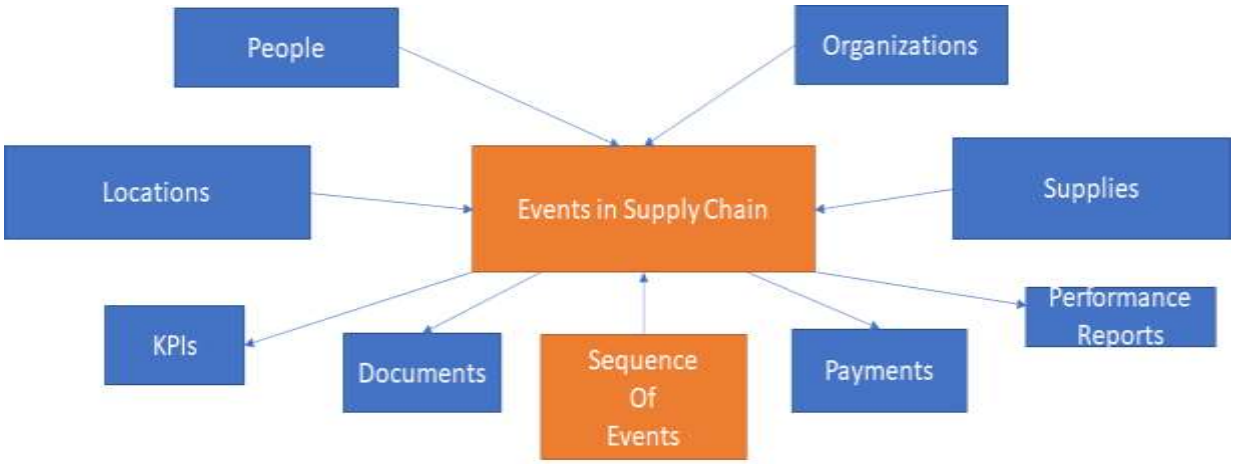


Figure 1: Supply Chain Events

An efficient, optimized supply chain is already so important to the fulfilment of customer orders for a company. But when managed correctly, it can also result in much lower costs, and a faster production cycle. SCM is the umbrella term that covers product development, sourcing, production, procurement, logistics and more when it comes to operations in the supply chain. Without it, companies run the risk of reducing its customers, and losing a competitive edge in respective industries. Efficient supply chains will work with an effective returns process. It has been found that customers are 71% more likely to become returning customers if they are happy with the way their return process was handled.

About SONY PlayStation

The PlayStation is a home video game console developed and marketed by Sony Computer Entertainment. Sony has been able to develop its supply chain management strategy which has played a great role in the company's success within the global market.

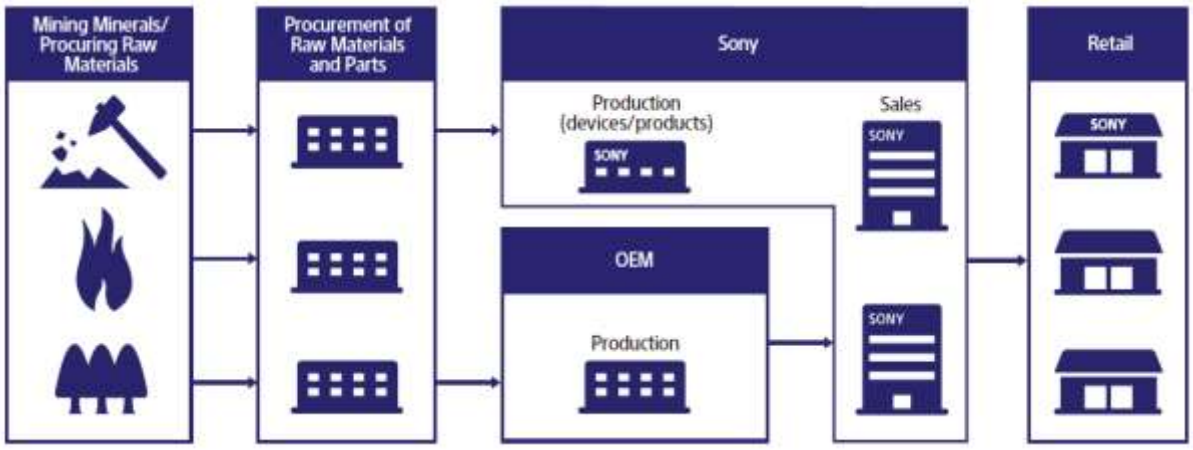


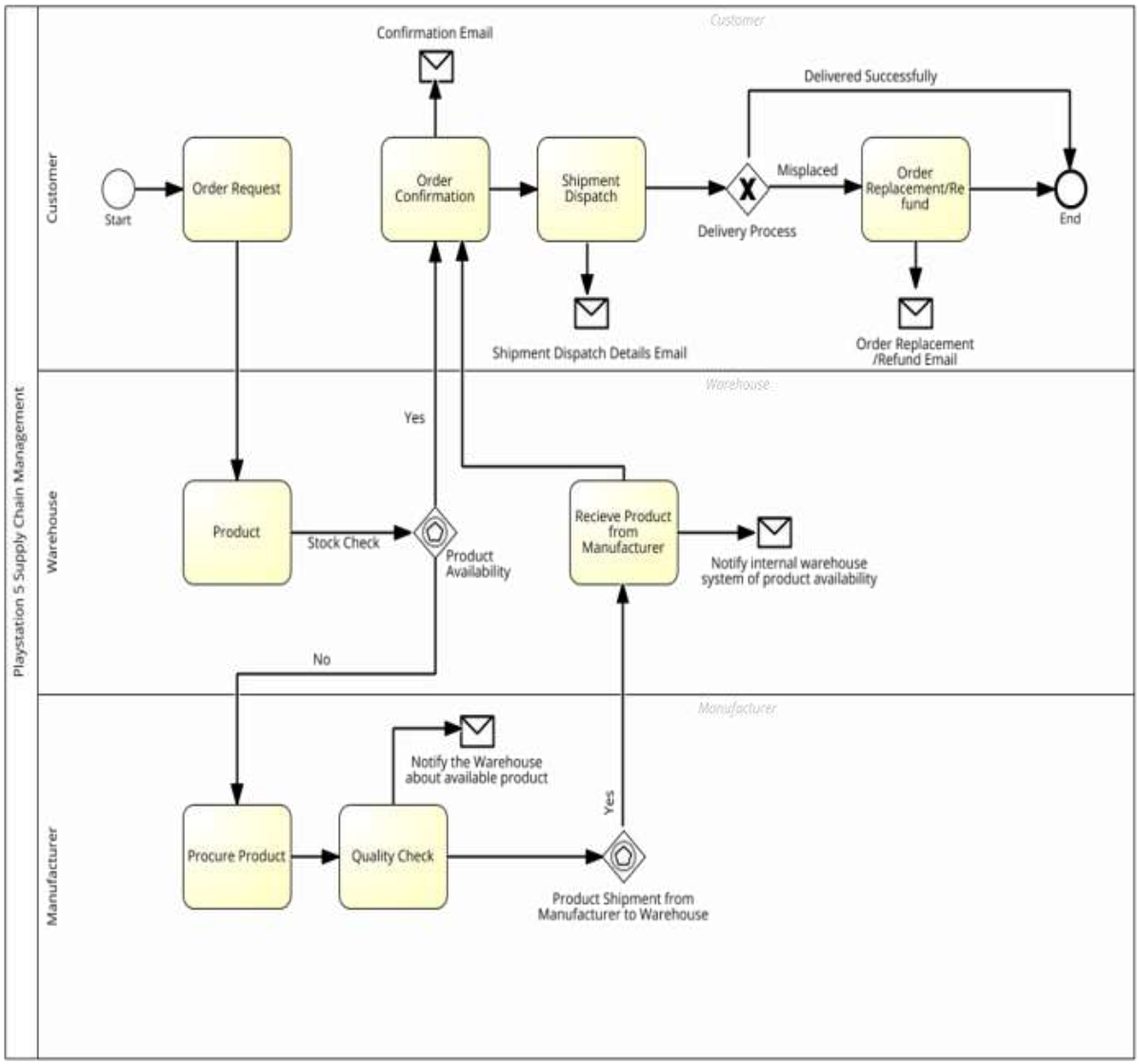
Figure 2: SONY's High Level Supply Chain Flow

The structure of the company's supply chain includes materials gained from manufacturers used to produce electronic goods, primary suppliers of the parts and materials, Sony production lines which are used to design and develop device products and the company's retail centres which are used to market the products. The Manufacturing Centre was set up in the state of California because it had all the necessary components for Sony to run a successful company, including a thriving economy, inexpensive and readily available labour, and a suitable location that would allow for the easy shipment of various components from Japan. Sony's Supply Chain System is the only logistics operator in Sony Group.

2 Shortcomings

- High Demand: The demand for Sony PlayStation has spiked sharply as more people began to shift to a work-from-home setting in early 2020. The company has expected sales to go higher in this current fiscal year.
- Shortage of Raw Materials: South Korea and Taiwan are some of the world's largest producers of semiconductor chips. However, due to the increased demand and health restrictions due to the COVID-19 pandemic, catching up on the production demand may be slower than usual. The world is currently experiencing a shortage of semiconductor chips. These are essential parts for creating current electronic devices such as game consoles. The trade war with China has further hampered the supply of raw materials.
- Shutdown of factories due to COVID-19 pandemic: As per the national and local government mandate, Sony had shut down four manufacturing plants in China (two in Shanghai, one in Wuxi, Jiangsu, and one in Huizhou, Guangdong), two manufacturing plants in Malaysia (Kuala Lumpur and Penang) and one in U.K. (Wales).
- Bloomberg reports Sony will make about 4 million fewer PlayStation 5 systems in its current fiscal year, a production cut attributed to a weakened supply chain that provides the console’s motherboard.
- Jim Ryan, CEO, Sony Interactive Entertainment has stated in multiple interviews about the issues Sony is facing with respect to its supply chain for PlayStation 5. He has stated that the company is trying to keep up with the demand and supply but is failing to do so.
- Sony is expecting this shortage and disruption in the supply of PlayStation to go on until next year.

3 The BPMN Diagram



4 Process Narrative

I. We have three swim lanes, one each for the customer, the warehouse and the manufacturer.

II. We begin in the customer swim lane, when they place an order.

III. The order is received by the warehouse; if the product is available, a notification email is sent to the customer, else the warehouse will check with the manufacturing unit to procure the product.

IV. The manufacturing unit, upon receiving the request, will ship the product to the warehouse, after it passes the quality assurance test.

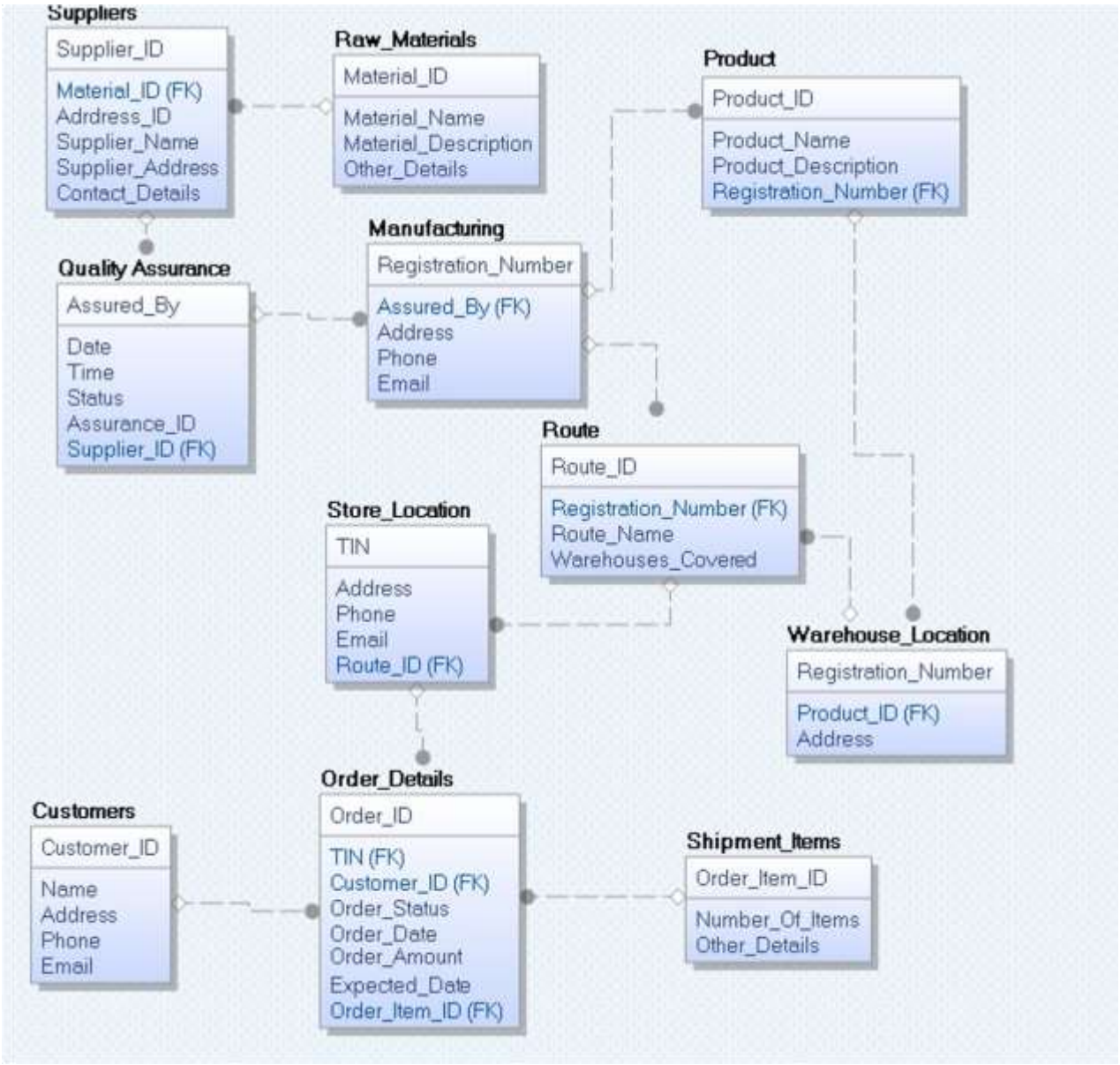
V. Once the product arrives at the warehouse, the customer's order is confirmed and a notification is sent to them.

VI. Afterwards, the shipment is dispatched, and the notifications of the order status are sent to the customer via email.

VII. If there are no further delays/ hindrances, the order is successfully delivered and the status is changed to closed.

VIII. If there are any issues during the shipping and delivery processes, the order status is changed accordingly.

5 The Conceptual Data Model



6 Scope of the Logistics Network

- Technology Complements Teams
- Pre – fulfillment speed becomes vital
- Customization along the Supply Chain
- Inventory Flow Optimization
- Enhanced Relationship with Suppliers

1] **Technology Complements Teams**- As we all know that development of technology goes hand in hand with the supply chain management it allows supply chain teams to add something innovative to the current process. The usage of newly tools and technology is necessary. However, supply chain is must to have hands on approach to the various business process

2] **Pre – Fulfillment speed becomes vital** – If the pre fulfillment factor of company is efficient then the customers will receive quicker orders. No matter how streamlined a team's fulfillment processes it all depends upon the standard of supply chain. For an example Nike has made some modification with its processes in which they have include rapid proto-typing so that they can change supply chain agility easily.

3] **Customization along the Supply Chain** – Customization can be defined as implementation of segment-based changes to their supply chain processes. In this company focuses on the factors like

- Geographic Conditions- How close they are to sourcing and production
- Product related needs- How can you do product individualization
- Order related needs- Quantity of products that a customer need when exactly they actually need that product

If you take an example then adidas has done the customization of their supply chain.

4] **Inventory Flow Optimization** – The right amount of inventory space can only be achieved if you have supply chain which can do this work effortlessly

5] **Enhanced Relationship with suppliers-** To have a strong and mutually beneficial relationship with their supplier's supply chain does two most prominent things and that is

- They maintain and establish clear line of communication
- They also focus on future company mission

As much as communication is concern the supply chain teams needs to ensure that suppliers are confidential to any information which create an effect on their process

The relationship with the suppliers is very deep as compare to the optimization process.

8 Virtualization of the Logistic Supply Chain

The need of virtualization was to describe rationale for picking up the set of appropriate warehouses to be applied to the supply chain logistic that we have here. The major goal of this project is to demonstrate to build a logistic network where SONY runs their product (i.e., PlayStation video game consoles) where the need to stock the product at various locations throughout United States. The process of virtualization includes the use of transportation modes, warehouses, and overall understanding of efficiency to create a logistics network that could be implemented across Sales Regions scatter across the map of United States.

- Examining Customer Region Scatter: Shown in the figure below which principally exemplifies a demographic plot distribution of Sales of PlayStation across United States. In obvious patterns, there is more of scatter populace of sales in either of the coasts (Oakland, Los Angeles, etc.) with a toss of populace also in the Southwest (Dallas, New Orleans, etc.) Southeast (Orlando, Atlanta, etc.) & a few in the Midwest (Chicago, Kansas City, etc.)

- Examining Current Warehouse Locations: Revealed in the figure below are the current system's warehouse locations that are to be re-located and re-engineered. To move on with the further process of optimized re-locating warehouses, a few of the constraints have been taken in consideration that are chiefly –
  - Proximity to Freeways, Rail dock and Airports.

- Cost of Warehouse establishment.
- Storage Facilities
- Desired Consumer Base
- Proximity to Carrier Services.

Current Process's Warehouse Location	Dense Customer Region/Mayor's House	Distance	ETA
Patterson, CA (#OAK3)	Sacramento	77.6mi	1h 36m
	San Francisco	67.0mi	1h 56m
	San Jose	55.8mi	1hr 29min
	Reno	200.6mi	3hr 55min
	Oakland	58.4mi	1hr 15min
San Bernardino, CA (#ONT2)	Bakersfield	164.7mi	2hr 58min
	Santa Barbara	156mi	2hr 58min
	Los Angeles	62mi	1hr 30min
	Pasadena	54mi	59min
	Long Beach	73.2mi	1hr 45min
	Anaheim	49.5mi	1hr 25min
	San Diego	110.2mi	1hr 55min
	Las Vegas	288mi	3hr 48min
Goodyear, AZ (#PHX5)	Phoenix	10.2mi	40min
	Mesa	20.0mi	45min
	Tucson	116.6mi	1hr 58min

	Albuquerque	430.1mi	7hr
	Denver	827.0mi	14hr 23min
Fort Worth, TX (#XUSB)	Fort Worth	10.7mi	45min
	Dallas	38.4mi	49min
	Arlington	16.6mi	32min
	Oklahoma City	200.2mi	3hr 10min
Fort Worth, TX (#FTW4)	San Antonio	24.5mi	47min
	Austin	68.0mi	1hr 39min
	Houston	185.0mi	2hr 50min
	New Orleans	532.0mi	8hr 10min
Union City, GA (#ATL7)	Nashville	36.0mi	1hr 05min
	Memphis	298.0mi	3hr 57min
	Birmingham	199.0mi	3hr 12min
	Montgomery	289.0mi	4hr 20min
	Atlanta	219.0mi	4hr
	Charlotte	411.4mi	6hr 45min
	Charleston	526.0mi	8hr
Ruskin, FL (#TPA1)	Miami	240.0mi	3hr 55min
	Jacksonville	198.3mi	3hr 20min
	Tampa	39.0mi	1hr 20min
	Orlando	58.0mi	1hr 12min
	Indianapolis	21.0mi	50min

Indianapolis, IN (#IND4)	Kansas City	472.0mi	7hr 49min
	St. Louis	233.1mi	4hr
	Columbus	197.2mi	1hr 4min
	Detroit	309.0mi	4hr 58min
	Cleveland	348.0mi	5hr 45min
	Pittsburgh	385.0mi	7hr
Whitestown, IN	Chicago	66.8mi	1hr 45min
	Evanston	57.0mi	2hr 6min
	Milwaukee	45mi	1hr
	Minneapolis	379.3mi	6hr 13min
Nashua, NH (#BOS1)	Hartford	8.9mi	29min
	New Haven	48.8mi	1hr 20min
	Providence	79.2mi	1hr 58min
	Boston	108.0mi	1hr 55min

	Albany	108.0mi	2hr
Middletown, DE (#PHL1)	Washington D.C	349.54mi	2hr 12min
	Baltimore	310.6mi	1h 45m
	Philadelphia	218mi	1hr 11min
Swedesboro, NJ (#EWR6)	Edison	16.0mi	1hr 03m
	New York City	25.0mi	56min
	Garden City	48.6mi	1h 52m
Dupont, WA (#BFI3)	Seattle	37.8mi	55min
	Portland	148.8mi	2hr 34min

- Examining Re-Engineered Warehouse Locations: Revealed in the figure below are the current system's warehouse locations that have been re-engineered and enhanced to new warehouse locations. Keeping in mind all the constraints in considerations, the newly augmented warehouse locations have condensed in total distance of commute & total time for commute.

Warehouse Location	Dense Customer Region/Mayor's House	Distance	ETA
Tracy, CA (#OAK4)	Sacramento	67.6mi	1h 9m
	San Francisco	63.0mi	1h 6m
	San Jose	55.5mi	1hr 2min

	Reno	198.6mi	3hr 22min
	Oakland	51.4mi	54min
San Bernardino, CA (#SNA4)	Bakersfield	164.7mi	2hr 37min
	Santa Barbara	150mi	2hr 20min
	Los Angeles	60mi	58min
	Pasadena	52.mi	50min
	Long Beach	71.5mi	1hr 17min
	Anaheim	47.5mi	58min
	San Diego	107.2mi	1hr 44min
	Las Vegas	225mi	3hr 22min
Phoenix, AZ (#PHX7)	Phoenix	8.4mi	11min
	Mesa	18.9 mi	26min
	Tucson	113.2mi	1hr 40min
	Albuquerque	419.3mi	6hr 32min
	Denver	820.9mi	13hr
Fort Worth, TX (#FTW3)	Fort Worth	10.mi	13min
	Dallas	32.4mi	37min
	Arlington	15.6mi	19min
	Oklahoma City	199.6mi	2hr 55min
Schertz, TX (#SAT1)	San Antonio	22.5mi	28min
	Austin	64.9mi	1hr 3min
	Houston	183.5mi	2hr 41min
	New Orleans	529.4mi	7hr 47min
Murfreesboro, TN (#BNA3)	Nashville	34.1mi	40min
	Memphis	293.3mi	3hr 35min
	Birmingham	194.9mi	2hr 53min
	Montgomery	283.9mi	4hr 9min
	Atlanta	216.1mi	3hr 41min
	Charlotte	409.4mi	6hr 26min
	Charleston	521.3mi	7hr 58min
Lakeland, FL (#TPA2)	Miami	236.2mi	3hr 44min
	Jacksonville	193.6mi	2hr 55min
	Tampa	35.9mi	40min
	Orlando	56.3mi	55min
	Indianapolis	19mi	27min
	Kansas City	469.9mi	7hr 14min

Plainfield, IN (#IND5)	St. Louis	230.1mi	3hr 40min
	Columbus	194.2mi	1hr 6min
	Detroit	305.1mi	4hr 42min
	Cleveland	335.7mi	5hr 21min
	Pittsburgh	378mi	6hr 5min
Kenosha, WI (#MKE1)	Chicago	65.9mi	1hr 30min
	Evanston	55.3mi	1hr 6min
	Milwaukee	40mi	44min
	Minneapolis	372.3mi	5hr 34min
Windsor, CT (#BDL1)	Hartford	7.4mi	11min
	New Haven	45.5mi	45min
	Providence	74.2mi	1hr 37min
	Boston	102.8mi	1hr 35min
	Albany	105.3mi	1hr 42min
New Castle, DE (#PHL1)	Washington D.C	347.55mi	1h 53m
	Baltimore	308.2mi	1h 13m
	Philadelphia	215mi	44min
Carteret, NJ (#EWR9)	Edison	14.1mi	26m
	New York City	22.2mi	37m
	Garden City	46.6mi	1h 27m
Sunmer, WA (#BFI1)	Seattle	33.8mi	36min
	Portland	143.5mi	2hr 15min

Explanations for Mitigating Re-Engineered Warehouse Locations

Tracy, CA

Warehouse at Tracy in Northern California servers San Francisco, Bay Area, San Jose, Silicon Valley Sacramento & Reno in Nevada. To reach out to customers in these areas doesn't take more than 1.5 hours via freeways except that for Reno where it takes around 3 hours because eventually this warehouse is the closest than any other warehouse. This location for the warehouse establishment is cheaper as well since it's a distant from dense urban settlement but in close proximity to freeways.

San Bernardino, CA

The warehouse serves delivery to LA county and its widespread urban stretch such as LA city, Pasadena, Long Beach, Anaheim, Hollywood, Bakersfield, Santa Barbara which guaranteeing delivery within 2hrs. Two other distant populated cities and their nearby locations, also come under this warehouse's distribution circle that are Las Vegas and San Diego which take around 2.5 hours by road guaranteeing delivery in around 3.5 hours. San Bernardino outskirts suits perfect for the warehouse establishment as its cheaper since it's a distant from dense urban settlement but in close proximity to express freeways routes.

Phoenix, AZ

This servers' locations in and around Phoenix city, Tucson, Mesa assuring delivery time from 30 minutes to 2 hours. It exceptionally also serves Albuquerque and Denver and also their nearby neighbouring urban & dense counties. Delivering New Mexico and Colorado takes around 6 hours and 12 hours being the most challenging in time complexity as this warehouse is the only that is close by route.

Fort Worth, TX

The scattered population across Dallas, Arlington, Plano and Fort Worth in around 1.5 hours. This warehouse also delivers to Arkansas and Oklahoma State as it situated in the northern part of Texas while having the only choice for deliveries from there, taking around 3 to 6 hours on highway.

Schertz, TX

The warehouse is located just a couple of miles on the outskirts on San Antonio, delivering scattered population across San Antonio, Austin and Houston. This warehouse also delivers to Louisiana State especially New Orleans as it situated in the southern part of Texas while having the only choice for deliveries from there, taking around 6 to 8 hours on highway.

Sumner, WA

This warehouse is ideally the best for urban settlement in and around Seattle where the goods deliver in 30 minutes. It also serves delivery to the rest of the Washington, Oregon, Idaho and Montana varying lead time from 3 to 12 hours.

Murfreesboro, TN

This location is again one of the busiest and a significant one as it serves four of its neighbouring states (North Carolina, South Carolina, Alabama & Tennessee). The ideal lead time to reach major customer in urban patch areas like Nashville, Memphis, Birmingham, Montgomery and Atlanta ranges from 30 minutes to 3 hours. While urban patches like Charlotte and Charleston take led times pretty longer than other destinations via highway routes.

Lakeland, FL

The warehouse in this location sits perfectly for freight transportation solely within Florida. The absolute reason this warehouse serves delivery solely within Florida is because of the elongated geographical location of these destinations which makes it too far from the other warehouses with lead time ranging from 30 minutes to 3.5 hours. The major customer orders are from Jacksonville, Orlando, Tampa and Miami.

Plainfield, IN

Located in Indiana close to Indianapolis, this warehouse is again one of the busiest and a significant one as it serves six of its neighbouring regions collectively (Kansas, Missouri, Southern Illinois, Ohio, Michigan and Pennsylvania). Its major customer distributions are laterally distributed from Kansas City, St. Louis, Indianapolis, Columbus, Detroit, Cleveland & Pittsburgh with delivery lead times ranging from 27 minutes to 8 hours.

Kenosha, WI

This location is unique for its motor freight transportations as its lead time range isn't long promising a guaranteed delivery within time. Its major orders are from Chicago, Evanston, Milwaukee and Minneapolis.

Windsor, CT

This is warehouse in Connecticut is distinctive for its distribution in the New England region. The significant orders are from Boston, Albany, Hartford, New Haven and Providence with a lead time span from 20 minutes to 2 hours.

New Castle, DE

The warehouse situated in Delaware crucial role amongst other warehouse locations since it dispatches two of Mayor's Offices in Washington D.C & in Philadelphia. Its major orders are from Baltimore, Philadelphia, D.C, Buffalo and covering most parts of southern New Jersey, Pennsylvania, Maryland, Delaware and Virginia. The promising lead time in delivery complexity makes it a reliable warehouse in the network.

Carteret, NJ

This is the warehouses that dispatches to the big apple city and most importantly to its Mayor's Office of City Hall Park in New York City. The dispatch distribution is mostly across most of New Jersey, New York with a promising and challenging ETA lead time as convincing as it could be.

8 Benefits

- No delays
- Enhances supply chain network
- Flexible shipping options
- Improved cash flow
- Improved risk mitigation
- Higher efficiency rate
- Decreased cost effects

- **No to less delays in process**: One of the main benefits is the fact that through communication, you can lower any delays in processes. Since everyone is aware of what they are doing as well as what others are doing, this will mitigate any late shipments from vendors, logistical errors in distribution channels, and hold-ups on production lines.
- **Enhances supply chain network**: By combining all the information gathered on the different sectors of a business, it will allow you to have an enhanced supply chain network.
- **Flexible shipping options**: Whether you are shipping small parcels or large bulk orders to your customers, your customers expect it to arrive fast. Part of meeting their expectations and achieving a successful business is working with your shippers to offer flexible solutions. Supply chain management systems can help you determine optimal ways to ship better while reducing costs.
- **Improved cash flow**: Once collaboration is improved and you can access new technologies to make your operations work better, you are guaranteed to see an increase in your profits. Meeting customer demand and working well with your business partners will allow you to increase sales, reduce loss, and grow as a business.
- **Improved risk mitigation**: Analyzing your supply chain data allows you to view potential risks before they occur. You can create a backup plan to respond to these unexpected circumstances and forecast periods where these errors are more likely to occur. By being proactive, rather than

reactive, you can get better control of your supply chain and significantly reduce any negative impacts.

- **Higher efficiency rate**: Having real-time data on the availability of raw materials and manufacturing delays allows companies to implement backup plans, such as sourcing materials from a backup supplier, preventing further delays. Without real-time data, companies often don't have time to initiate plan B, resulting in issues such as out-of-stock inventory or late shipments to end consumers.
- **Decreased cost effects**: by re-engineering the system we achieve the following:
  I. Improved Inventory system
  II. Adjusts the storage space for finished goods which eliminates damage resources
  III. Improved system's responsiveness to the actual customer's requirements
  IV. Improved relationships between the vendors and distributors

9 Summary

By this we can easily say that reengineering has helped to improve the quality by reducing the fragmentation of work and also helped to establish a clear business process and also helped Sony PlayStation.

- Speed up company processing time
- This has increased team productive and overall performance
- Service quality of customer can be improved
- The low cost has increased the profit
- Synchronization of demand to supply can be achieved
- Higher Satisfaction from the expert in the company can be achieved
- Greater process efficiency can be easily accomplished

1] Speed Up Company Processing Time – This is one of the most prominent things a company can do this by doing following steps like

A] Remove the suppliers which are not reliable

B] Choose the vendors which are closer to the warehouse

C] They should complete multiple process in same time

D] The communications which are internal must be better

E] Bring external processes in house

2] **Team Productive and overall performance –** As these two factors are one of the significant factors behind a company's success how actually they can be improved

A] Increase the supply chain visibility of your company

B] Do implementation of a innovative project

C] Arrange training programs so the team members will get hands on experience

D]Keep the all the important parts maintained

3] **Service quality of customers must be improved –** This can happen due to the reengineering of business process and this can give us brilliant results by some ways and that are

A] Keep your main focus on your satisfaction and engagement increase these two things

B] Do new offerings in multiple ways

C]Be part of your project team

D] Create a consistence experience across your branches

E] Train the employees in such a way that they can solve any problems

4] **Low costs increases profit –** Low costs can easily check the affordability of the customers that how many products he or she can if the product value is less all types of customers can buy it so this can take the profit of that company to the highest pinnacle

5] **Synchronization of demand to supply can be achieve -** This can be achieved by using five steps as follows

A] Collaboration and Engagement facilitation

B] Visible Establishment

C] Do collection of a real data

D] Do the execution

E] Apart from Reengineering you can do the measurement

Higher satisfaction from the experts and greater process efficiency can be achieved if you get all above factors.

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