LEAD TIME

Includes **different types of lead times,** cycle time Vs lead time, **strategies to reduce lead time** and **impact of lead time reduction** on business

DEFINITION

What is Lead Time?

Lead time is the time elapsed between when the customer has ordered and time when the customer has received the material

OR

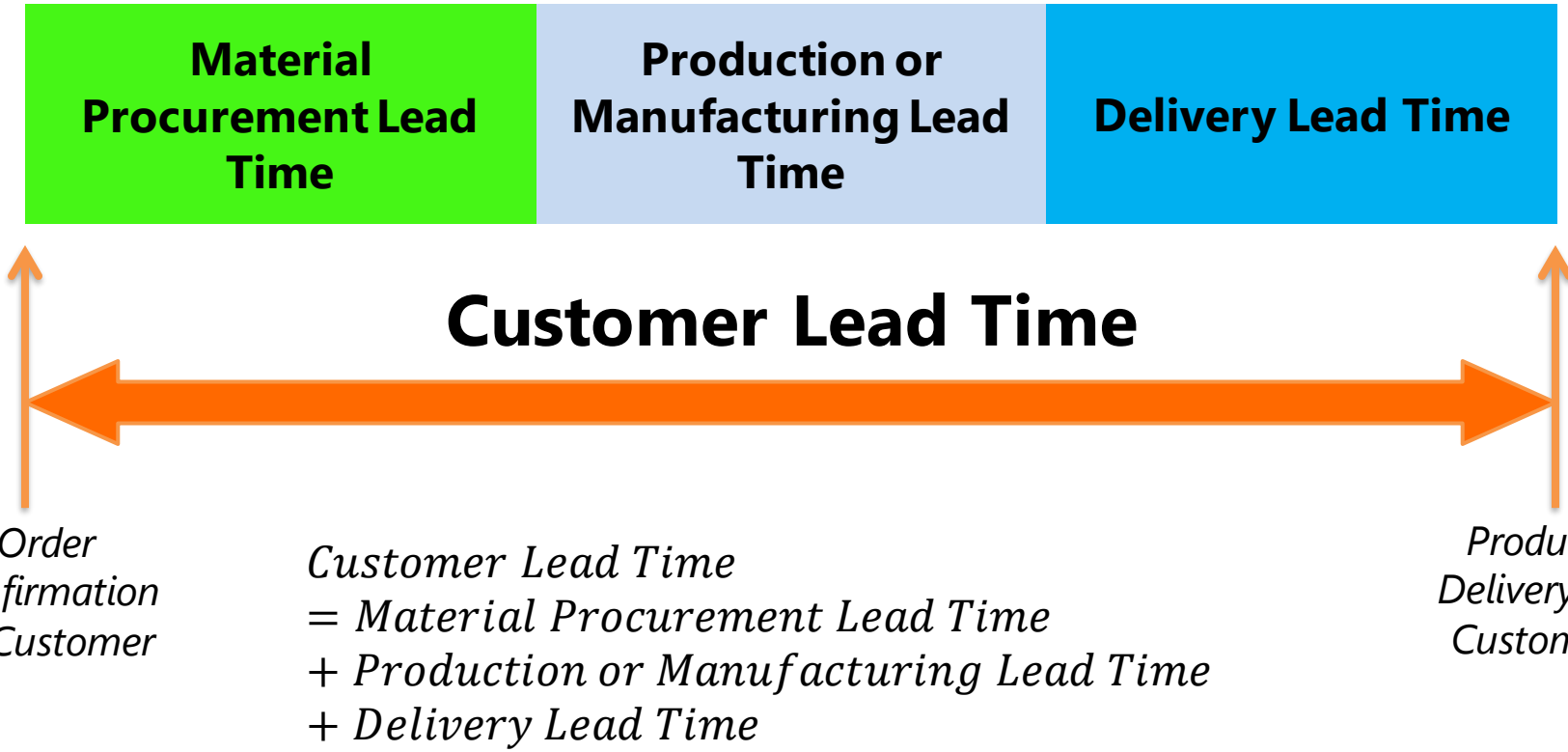
Lead Time is the amount of time between process initiation and completion. For our customers Lead Time is the time between a confirmed customer order and its scheduled pick up or delivery based on our terms and conditions. This varies based on the customer and the product.

Important point to remember

There are multiple definition of lead time and will be explained later in this article

TYPE OF LEAD TIME

There are several different types of Lead Time, but there are four primary types of Lead Time for our purposes in a manufacturing or assembly environment.



$$\begin{aligned} &Customer\ Lead\ Time \\ &= Material\ Procurement\ Lead\ Time \\ &+ Production\ or\ Manufacturing\ Lead\ Time \\ &+ Delivery\ Lead\ Time \end{aligned}$$

LEAD TIME EXPLAINED

1. **Customer Lead Time** – It is the amount of time taken between order confirmation and order fulfilment. This is essentially outcome of the other 3 lead time.
2. **Material Lead Time** – the amount of time it takes to place an order with a supplier and receive material against it, from confirmed order (to your supplier) to having it on hand at your premises.
   - If all the material required for producing the part required by customer is available at your premise & is free to use for this customer i.e. not committed for other product/ customer then this lead time is zero.
   - If it is not available in your premises, then its duration will depend upon whether your supplier is having ready "FG" at his end or he also has to manufacture. In case of latter, material lead time will definitely be high.

LEAD TIME EXPLAINED

3. **Factory/Production/ Manufacturing Lead Time** – It is the amount of time it takes to build/ produce/ manufacture required quantity using all the resources.
   - This depends upon orders in queue and the inventory levels on the shop floor
   - This is essentially throughput time i.e. time required to produce this part through all processes and put it into FG
4. **Delivery Lead time** – It is the amount of time it takes to ship the material.
   - This depends upon customer requirement and terms and condition mutually agreed upon at the time of award of business. If it is Ex factory, then it is the time required for any packing (in FG) if any. If it is at customer site, then all the transportation time required (by decided mode, road/ ship/ air) will be added to delivery lead time

LEAD TIME Vs CYCLE TIME

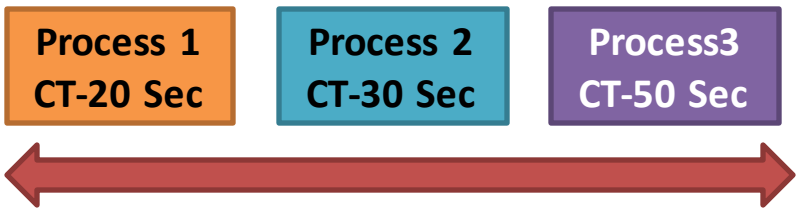
What is the difference between Production Lead Time and Cycle Time?

Cycle Time is the amount of time it takes to complete a cycle of action. Completion of a specific task from start to finish. More specifically it is the measured time that explains how often a part is completed by a particular process.

Factory/Production Lead Time is the amount of time it takes to build and ship a product if all the materials are available. This includes all the manufacturing, sub-assembly, and assembly processes that impact the ability to process material into a product.

#1

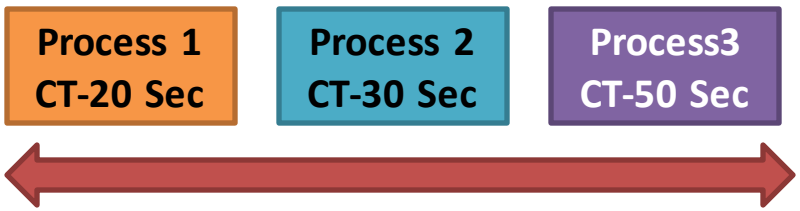
*Assuming No queue, no WIP and **single Piece** is to be made*



Through put time/ Lead time = 20+30+50 = 100 Sec/ Pc

#2

*Assuming No queue, no WIP and **100 Piece** are to be made*



Through put time = 20+30+50 = 100 Sec/ Pc
Lead Time = 100 X 100 = 10000 Sec for 100 Pieces ~ 2.78 Hours

BRILLUME

Passion for Light-up

IMPORTANCE OF LEAD TIME

Why is Lead Time important?

Lead Time is an important factor for customer satisfaction. Typically customers want goods or service as fast as possible with minimal effort.

For manufacturing and assembly the concept of Lead Time is married to and has a direct relationship with the amount of inventory that exists at different points in the overall supply chain.

If Customer Lead Time is less than: Material Lead Times, Production Lead Times, or Delivery Lead Times it will result in the holding of inventory within the supply chain at some or all points. Variation and inconsistency will often compound this issue – it will cause the holding of stock or inventory to mitigate risks in the supply chain

HOW TO REDUCE LEAD TIME

How to reduce Lead time?

Different Strategy to put in place in order to bring overall lead time down. This varies with product, processes and each customers

Customer Lead Time

As described in slide 3, it is actually a resultant of all the 3 lead times i.e. Material procurement lead time, production/ manufacturing lead time and dispatch lead time.

Strategy	Material Procurement Lead Time	Manufacturing Lead Time	Delivery Lead Time
Keep customer products in FG and replenish it when it reaches a certain level	0	0	↔
Keep all the RM for all the customer parts	0	↔	↔

HOW TO REDUCE LEAD TIME

Procurement Lead Time

For reducing procurement lead time, following strategies can be useful

1. **Use a Domestic Supplier** – This will drastically cut the time required for supply of parts especially if you do not keep any inventory of RM for that product/ customer
2. **Increase Order Frequency** – Yes, it actually works. Remember, your supplier too has manufacturing lead time besides his own material procurement lead time. So placing smaller and frequent orders cut down your lead time
3. **Provide Accurate Sales Forecasts** – This helps your supplier to actual plan his supplies on realistic, data based approach
4. **Convert to Standard Components or offshelf components** – Rather than having a design change and getting it manufactured, it is always better to use

HOW TO REDUCE LEAD TIME

Procurement Lead Time

standard, off the shelf components. This not only reduces the lead time but also lowers the manufacturing cost as well as inventory carrying cost.

5. **Vendor Managed Inventory** – Like you are keeping some FG inventory for your customer, you can also get into agreement with your supplier to keep some inventory for you.
6. **Consolidate and train Suppliers** – By consolidating Suppliers and awarding business to them will help in the sense that they will have substantial volume from you and you will be on their priority list thereby reducing lead times.
7. **Communicate** - Staying in touch with your supplier throughout the production process helps ensure that expectations are being met and that any issues along the way can be addressed promptly. Providing key performance indicators will also help motivate your supplier to achieve the levels of service you expect

HOW TO REDUCE LEAD TIME

Manufacturing/ Production Lead Time

For reducing manufacturing lead time, following strategies can be useful

1. **Waste elimination/ reduction** – Use lean or any other methodology to remove all kinds of waste. Once waste is removed, only value will be flowing through the value stream which will have shorter manufacturing or production lead time.
2. **Reliable Machinery** - For a shorter manufacturing lead time, stable operations is a basic necessity. TPM can be one of the method for having a reliable machinery along with preventive / predictive maintenance.
3. **Skilled and Stable manpower** – This is another very critical component for a stable operations. All Policies should be operator friendly and there should be emphasis on increasing skill level along with working on attrition rate.
4. **Loss reduction** – One of the most important thing in reduction of lead time is

HOW TO REDUCE LEAD TIME

Manufacturing/ Production Lead Time

Loss analysis and action on that. SMED can be used to reduce changeover loss. Andon can not only be used for quick communication in case of a breakdown but also serves to build quality at source. Similarly TPM can result into lower breakdown.

5. **Smaller Lot Sizes** – This will ensure material is dispatched to customer faster. This has been adopted by many organizations like Car OEM's etc
6. **Vertical Integration** - the ability to source, manufacture and assemble internally. This will reduce the need to procure from suppliers thus eliminating procurement lead time
7. WIP Reduction – Focus on line balancing so that WIP between stations can be eliminated and single piece flow can be achieved.

HOW TO REDUCE LEAD TIME

Delivery Lead Time

For reducing Delivery lead time, following strategies can be useful

1. **Milk Run** – Milk run is a concept where multiple parts/ products from same/ different suppliers are clubbed in a single trip and shipped to customer. This helps suppliers to send shorter lots rather than waiting for complete vehicle load and thus increasing delivery lead time
2. **Relocate near to customer** – Although this is not every time feasible, but mostly organizations supplying to OEM's retort to this method. Less distance means less time required for delivery.
3. **Elimination of secondary packing** – If the need for secondary packing is eliminated, the product is ready to be shipped as soon as it is out from production line

IMPACT OF LEAD TIME REDUCTION

Reduced Lead Times does have very positive impact on businesses. It can be used as a competitive strategy to win over the competition. Some of the benefits include

1. Quicker turnaround resulting into Higher customer satisfaction
2. reduced inventory
3. Reduced operational cost
4. Improved cash flow.
5. Reduced risk of product obsolesce.