VITA Analysis:

Understanding Product Flow for Competitive Advantage

What's the "Shape" of Your Product Flow?

On Time | Edge™

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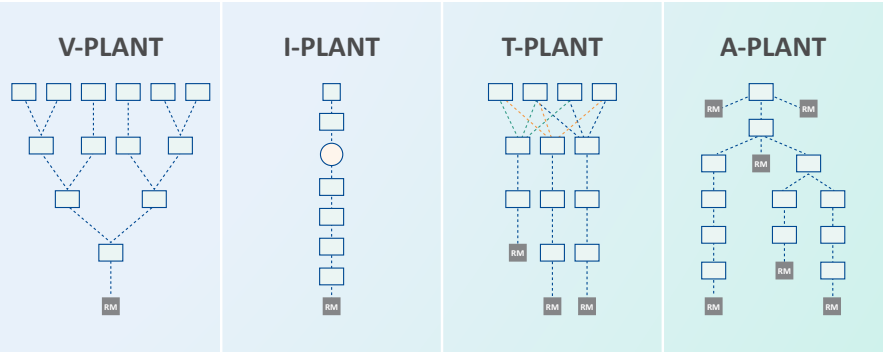
What's the "Shape" of your Product Flow?

Knowing your shape helps you generate more value in your company.

In your complex manufacturing environment, if you are experiencing shortages of the right parts but still hold excess inventory, VITA Analysis is for you. At On Time Edge, our consultants and thoughtware leaders use the VITA Analysis to help you identify the "shape" of your product flow. There are four shapes:



Better understanding your company's flow and explaining the complexity and variability of your operations to all managers and executives is the key to implementing the right processes and achieving the on-time and shipment performance your company needs.

V Plant

One to Many

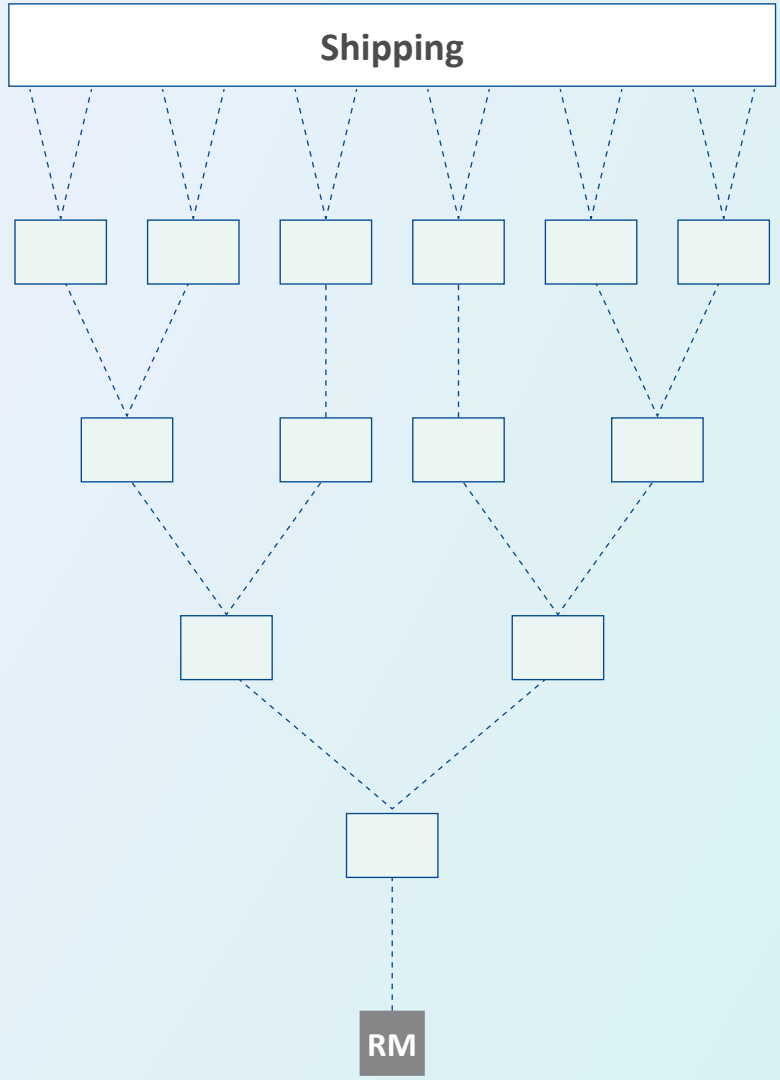
One material can become many things, a flow of one-to-many. Examples include parts that become radios or milk that becomes ice cream, cheddar cheese, and sour cream. One process may rob resources from another process. After processing begins, it can't move back through the line to feed another process.

Key Characteristics

- Large number of end items compared to number of raw materials
- Increasing number of divergence points in routing
- End items all go through a similar process
- Capital intensive, specialized or highly versatile equipment

Performance Issues

- High WIP and Finished Goods Inventory
- Interdepartmental conflicts about "supplier" gateway operation
- Push to large batch sizes



RM = Raw Material or Purchased Parts

I Plant

Flows in a Sequence

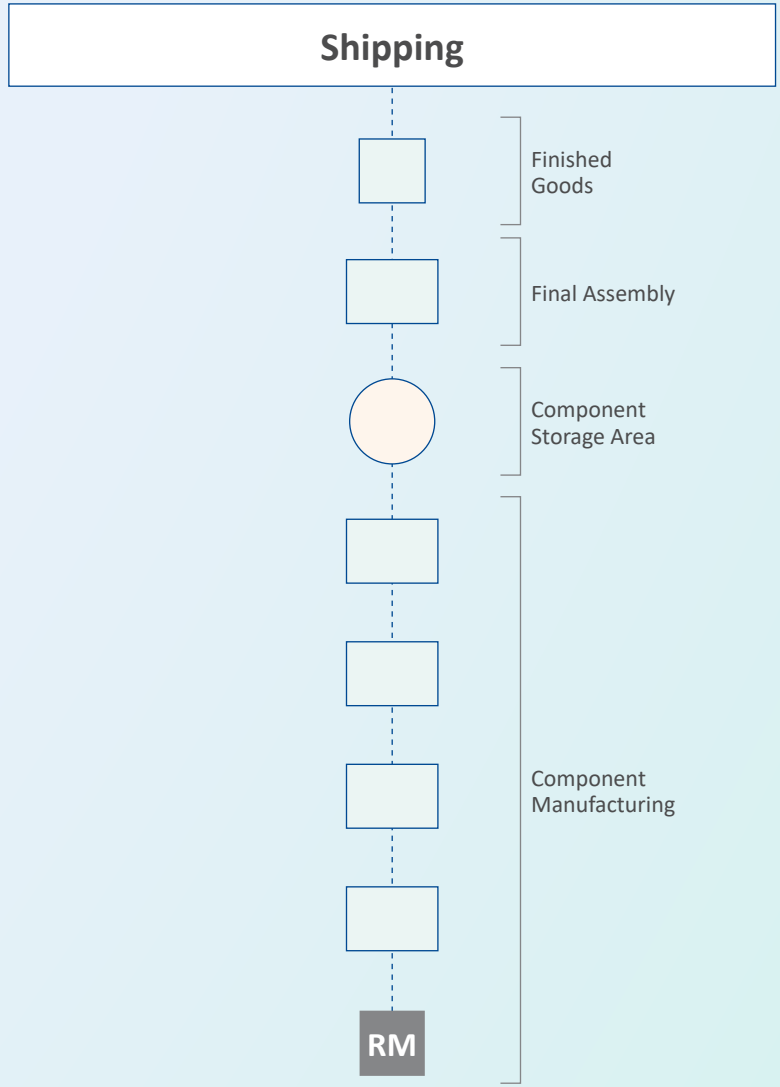
Workflows, such as those in an assembly line, are shown with steps in a sequence. Work moves from one step to the next (one to one). The main constraint is the slowest step. An example of workflow might be a fine jewelry workshop. Rings are formed, soldered, set with a stone, burnished, and polished.

Key Characteristics

- Similar number of FG, Sub and RM
- Focus is on balancing capacity of work centers
- Often similar run times at each step
- Simple products such as food, beverage, printing, value-stream-based operations

Performance Issues

- High variability in demand causes imbalanced load and low efficiencies
- Poor resource utilization
- Wandering bottlenecks (“the boa swallowed a burrito...”)
- Constant struggle to balance capacity with the load



RM = Raw Material or Purchased Parts

T Plant

Multiple Lines or Many to Many

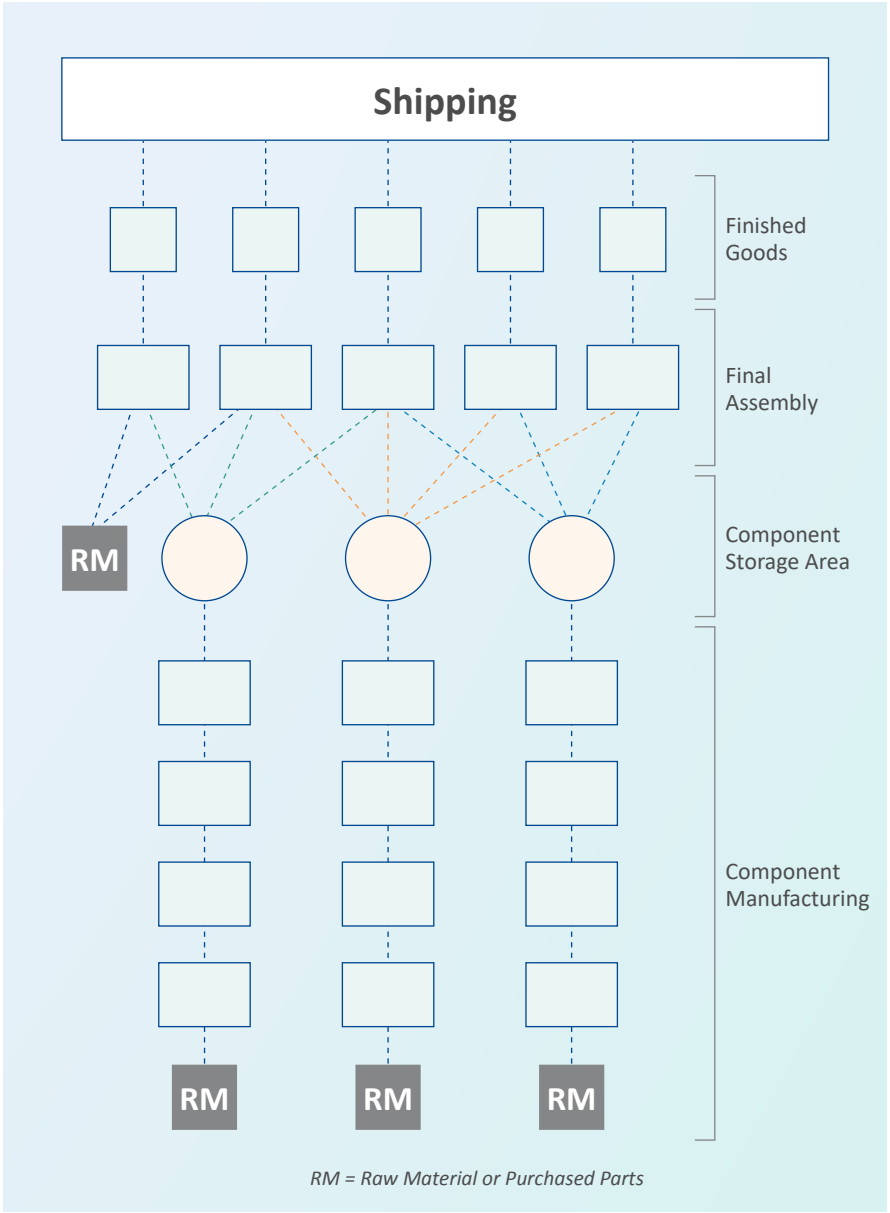
One general material flow can split to make many different products. T Plant is true of many manufactured parts, including computers with customizations, such as different colored cases and different speeds of CD/DVD players. Poor synchronization and the robbing difficulties (as one line takes materials from another) can plague T Plants.

Key Characteristics

- Large number of manufactured parts into small number of often configured end items
- Components tend to be specific to end items
- Dissimilar production routings
- Multi-purpose machines and tools

Performance Issues

- High WIP and Finished Goods Inventory (golden screw is missing again!)
- Production not responsive
- Emphasis on efficiencies



A Plant

Many to One

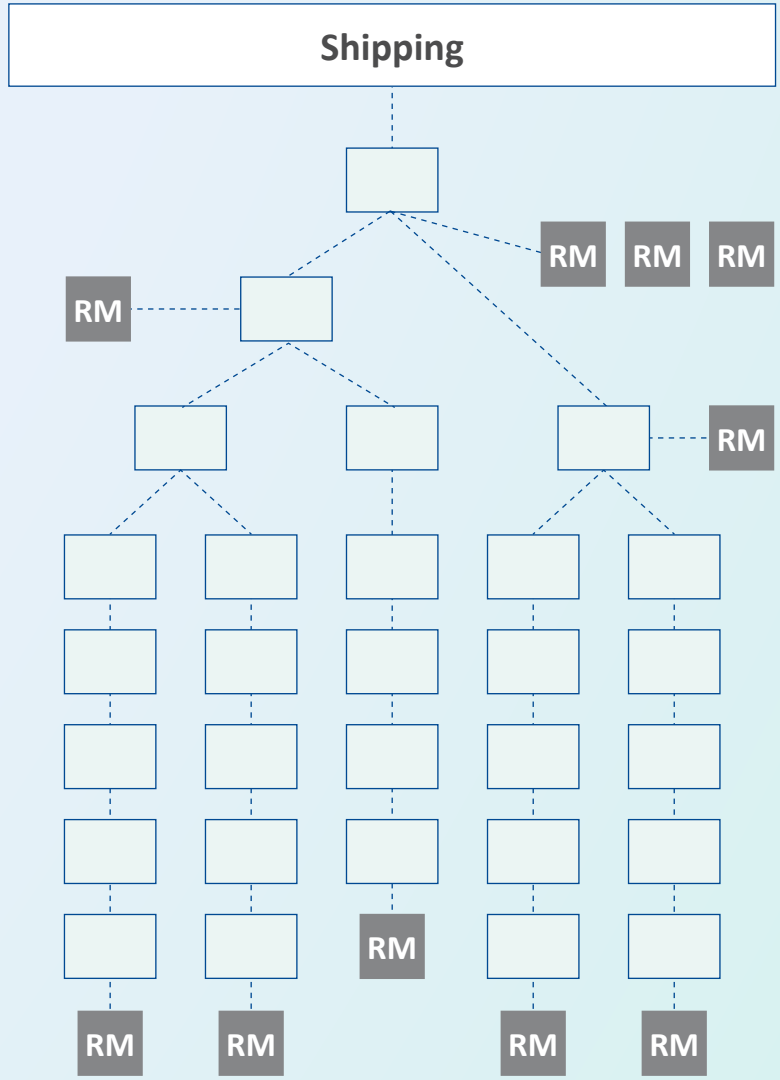
Many to One is the true assembly line, where different materials or components converge to build one product. Feeding lines must then be timed properly so the final product has enough materials.

Key Characteristics

- Large number of manufactured parts into small(er) number of end items
- Raw materials tend to be specific to end items
- Dissimilar production routings
- Multi-purpose machines and tools

Performance Issues

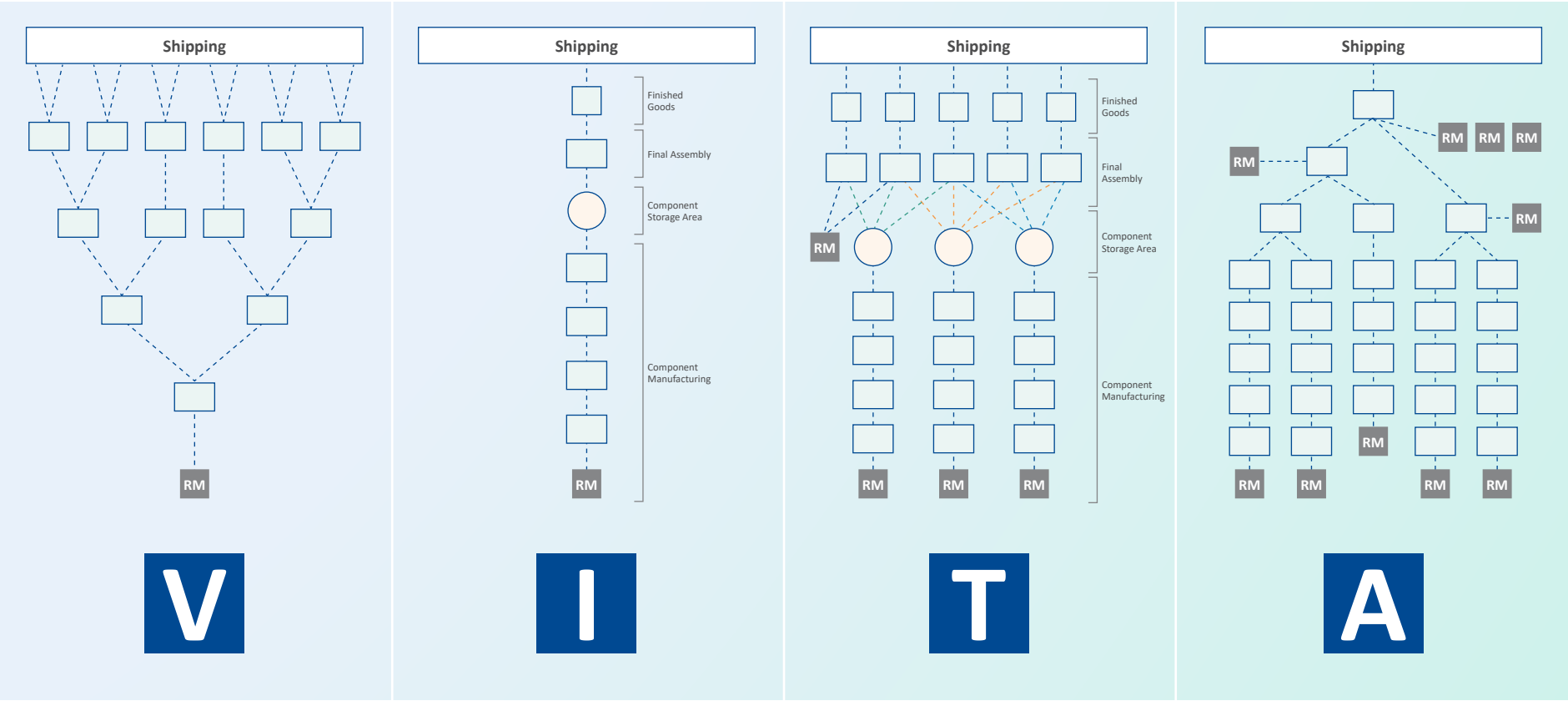
- Assembly experiences chronic shortages (“golden screw”)
- Excessive, unplanned over-time and WIP
- Unsatisfactory resource utilization
- Wandering bottlenecks
- At times, operation seems ‘out of control’



RM = Raw Material or Purchased Parts

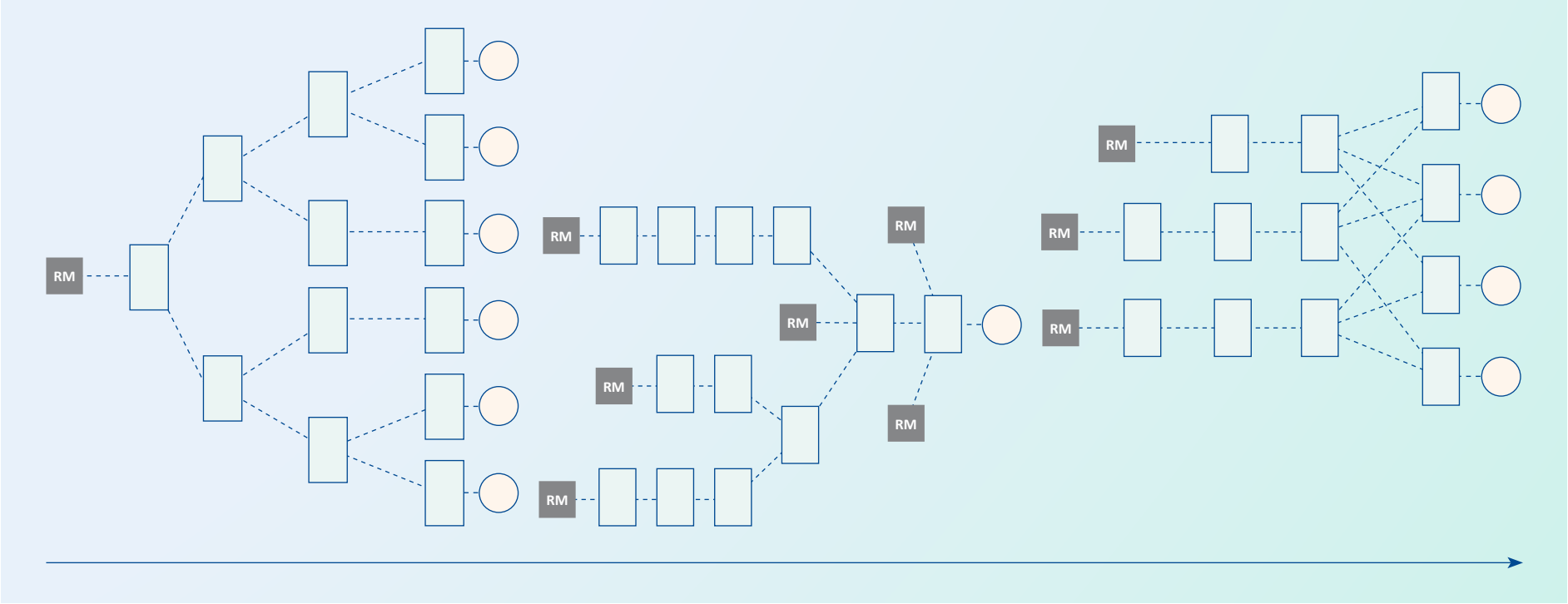
Implications of Different Flow Dynamics

In order to maximize our manufacturing capabilities and prevent material misallocations, it helps to take a high-level view to understand the four most prominent product flow types.



Few manufacturing companies' material flow have a unique "letter shape" that describes their entire operations.

We commonly find a "T" on top of an "A" on top of a "V"!



Why does understanding your material flow "shape" matter in your quest to achieve high On-Time Delivery (OTD) performance?

Because your shape determines how to leverage your constraint(s) best and synchronize your operations to achieve high OTD.

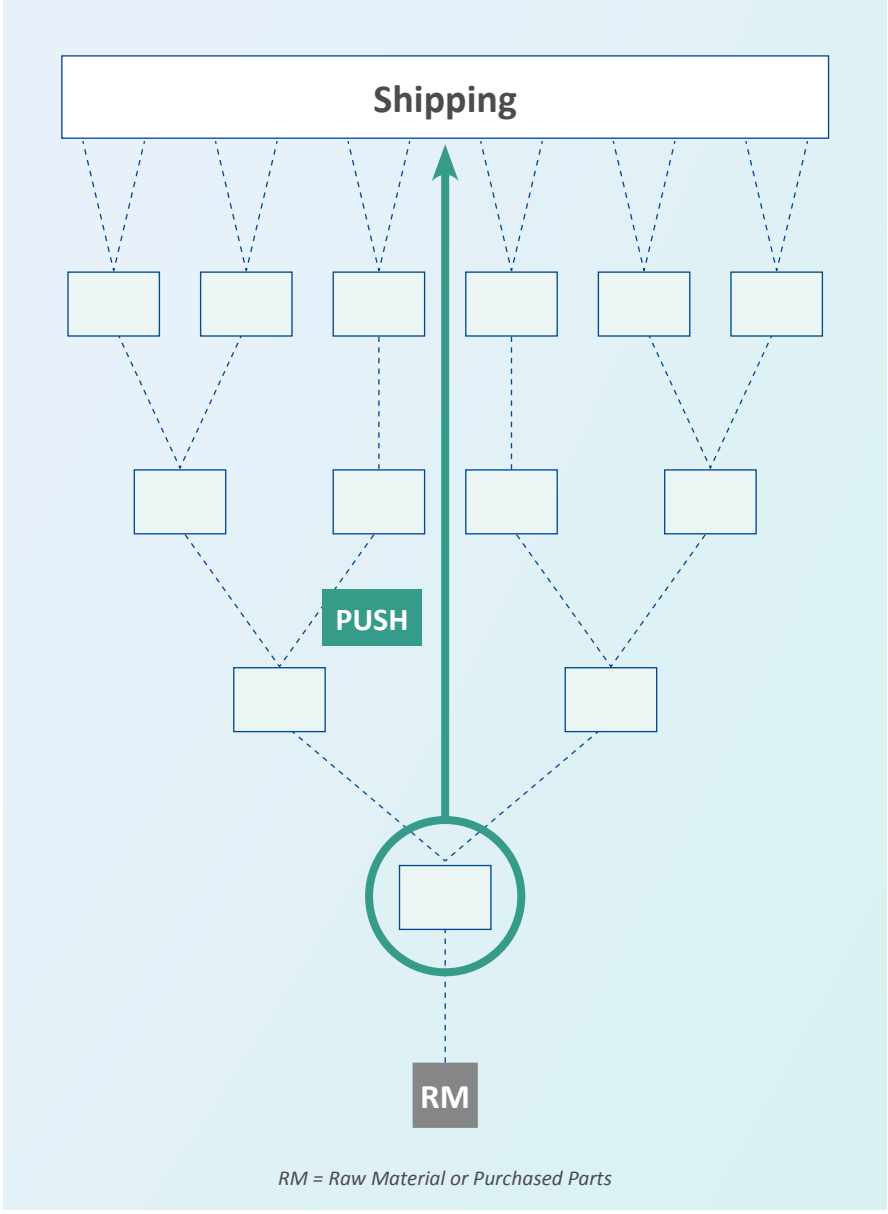
V Plant

Optimal material flow management

1. Place the “pacer” at the high-capital gateway (beginning) operation
2. Manage capacity to support the gateway operation’s pace
3. Keep lot sizes to a minimum - yet minimize setups at the gateway operation

Examples include injection and extrusion.

This method (DBR) ensures maximum flow, velocity and OTD.



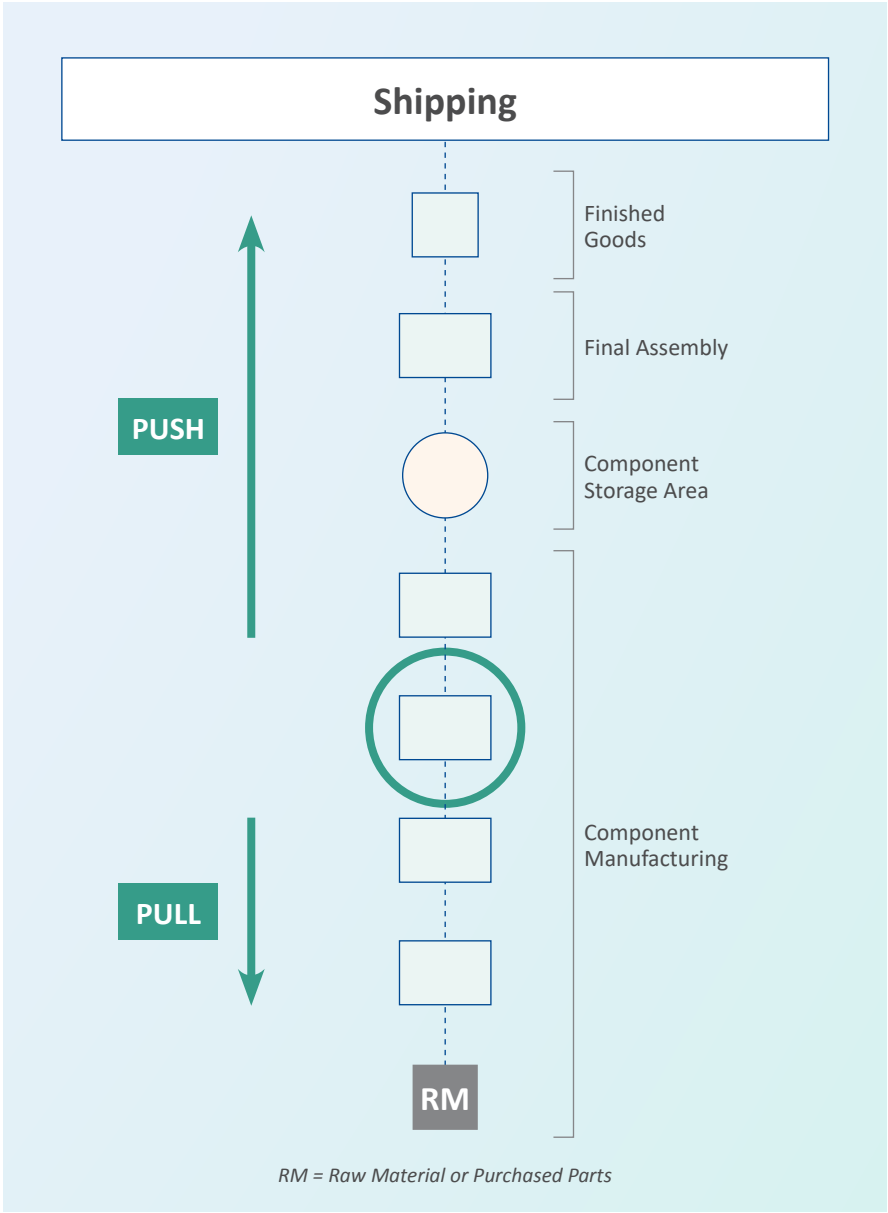
RM = Raw Material or Purchased Parts

I Plant

Optimal material flow management

1. Determine a “pacer” (or constraint) based on load and variability
2. Synchronize material release (pull)
3. Plan downstream ops using FIFO (push)
4. Protect constraint’s schedule against variability by inserting time buffers in the model (red triangle = “wait”)

This method (DBR) ensures maximum flow, velocity and OTD, minimum WIP and OE.

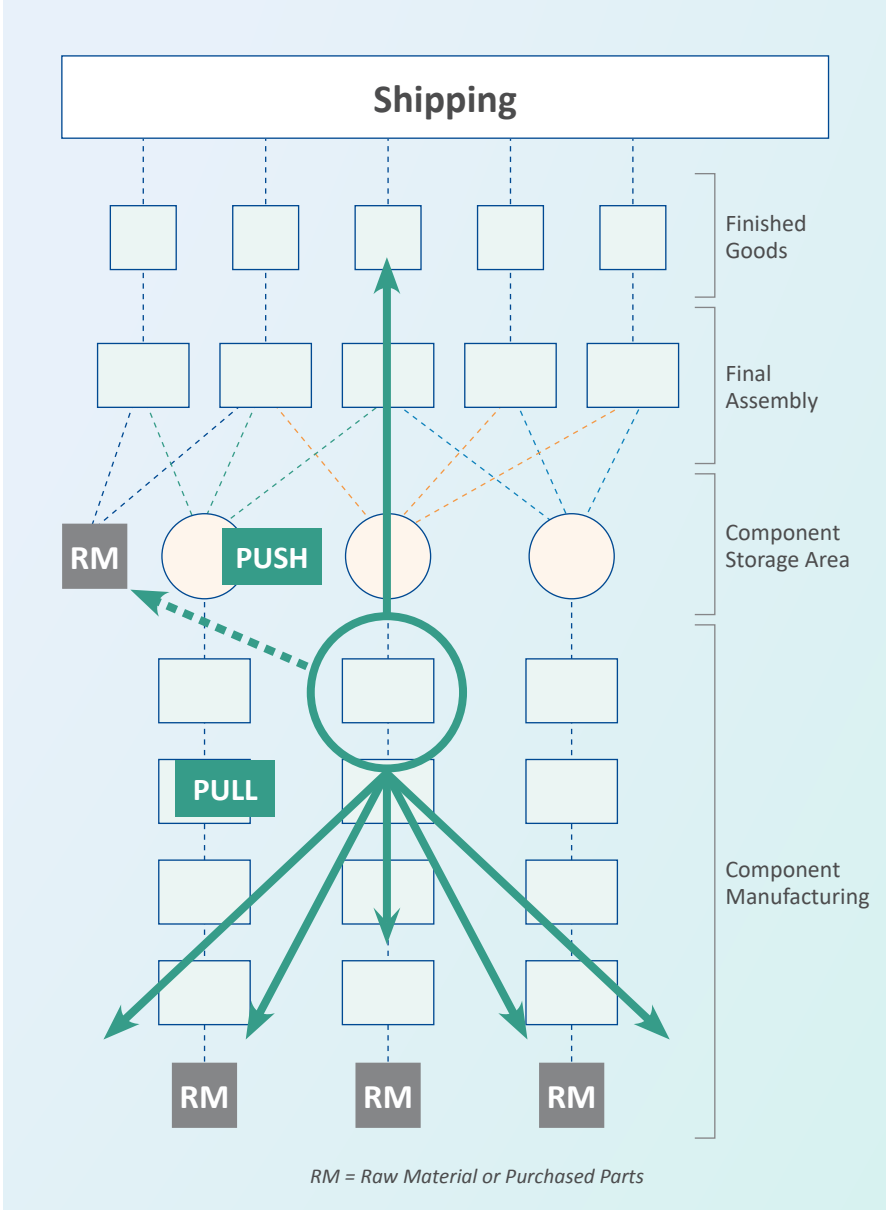


T Plant

Optimal material flow management

1. Determine a “pacer” (or constraint) based on overall load and variability
2. Synchronize all material release (pull) for all component “legs”
3. Plan downstream ops using FIFO (push), synchronize all materials to pacer

This method (DBR) ensures maximum flow, velocity and OTD, minimum WIP and OE.

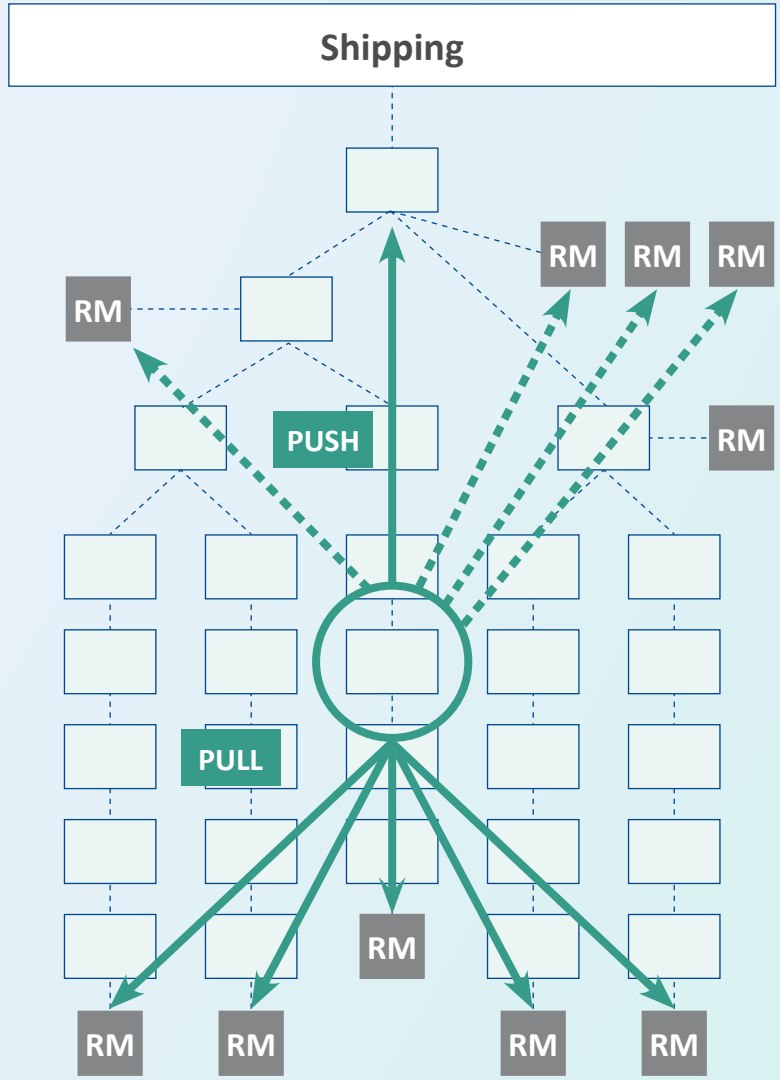


A Plant

Optimal material flow management

1. Determine a “pacer” (or constraint) based on its load and variability
2. Synchronize all material release (pull) for all component “legs” to the pacer
3. Plan downstream ops using FIFO (push), synchronize all materials to pacer (assembly RM are still pulled from assembly ops)

This method (DBR) ensures maximum flow, velocity and OTD, minimum WIP and OE.



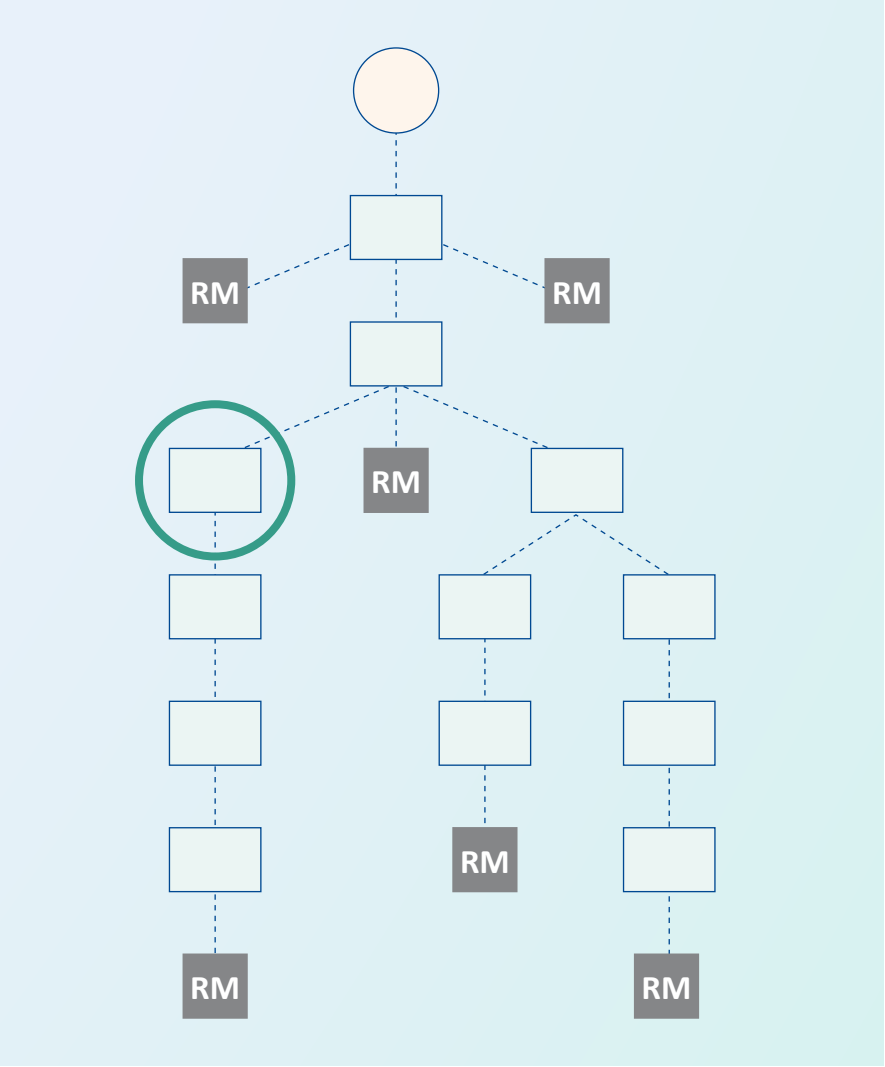
Things to Consider

If you already own an **APS** you may want to consider changing a few things:

1. Add strategic time buffers to protect your constraints from inevitable variability - being too “tight” won’t work
2. Switch non-constraints to infinite capacity in the model to avoid unnecessary “pushouts”
3. Train the entire company on a new philosophy that can significantly improve your OTD and increase your profits in a few weeks (WIP down 35%, OTD to 90%+, OT down 35%...)

If you are running **MRP with an ERP system:**

1. This concept can be applied using MRP and some external calculations (Manual DBR)
2. Depending on your “VITA Shape,” this can be accomplished in just a few weeks



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