

Supply Chain **Advantage**

Extending the Accelerate Time-based Improvement Philosophy to the Entire Enterprise

An Overview of Critical Concepts from the book **It's About Time**

Summarized by:

Andy Hayner

Operations Manager
MEP Supply Chain Advantage

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Competitive Advantage

MEP's Accelerate process and Rajan Suri's book *It's About Time* both center on a common theme, namely: The competitive advantage of applying time-based thinking throughout a company's extended-enterprise. MEP Supply Chain Advantage provides *It's About Time* as a standard resource supporting the Accelerate process because the book provides the set of common sense tactics and rationale necessary to apply time-based thinking as a comprehensive business strategy.

MEP Supply Chain Advantage recommends that executives launching Accelerate projects become familiar with the book's content because a central goal of all MEP assistance is to mentor clients to become more self-sufficient in conducting continuous improvement activities. *It's About Time* provides a great foundation for that. To facilitate your further investigation into time-based lean improvements, an overview of the book's four Critical Concepts is presented on the following pages.

Critical Concept 1:

The longer a value stream's true lead-time the greater its waste (page 20).

Manufacturing Critical-path Time (MCT) is the metric for true lead-time and is defined as "the typical amount of calendar time from when a customer creates an order, through the critical-path, until the first piece of that order is received by the customer". Waste created by long MCTs includes the following:

- ▶ Expediting of hot jobs requires systems, unplanned air freight, shop floor and office personnel to manage and execute the changes, even top-management time to negotiate priorities between multiple hot jobs
- ▶ Production meetings required to update priorities and change targets
- ▶ Overtime costs for trying to speed up late jobs
- ▶ Time spent by Sales, Planning, Scheduling, Purchasing, and other departments to develop forecasts and frequently update them
- ▶ WIP and finished goods holding costs and space usage
- ▶ Resources used to store and retrieve parts repeatedly during the long MCT, plus potential damage to parts due to repeated handling
- ▶ Obsolescence of parts made to forecast and stocked but not used
- ▶ Quality problems not detected until much later, resulting in large amounts of scrap and rework
- ▶ Time to deal with delivery date and quantity changes during the long MCT
- ▶ Order cancellations or loss of sales to competition
- ▶ Sales time devoted to expediting and to explaining delays to customers
- ▶ Investment in complex computer systems and organizational systems required to manage this dynamic environment
- ▶ Incidences of order cancellations, loss of sales, and loss of revenue due to lack of product availability or delayed market entry

Critical Concept 2:

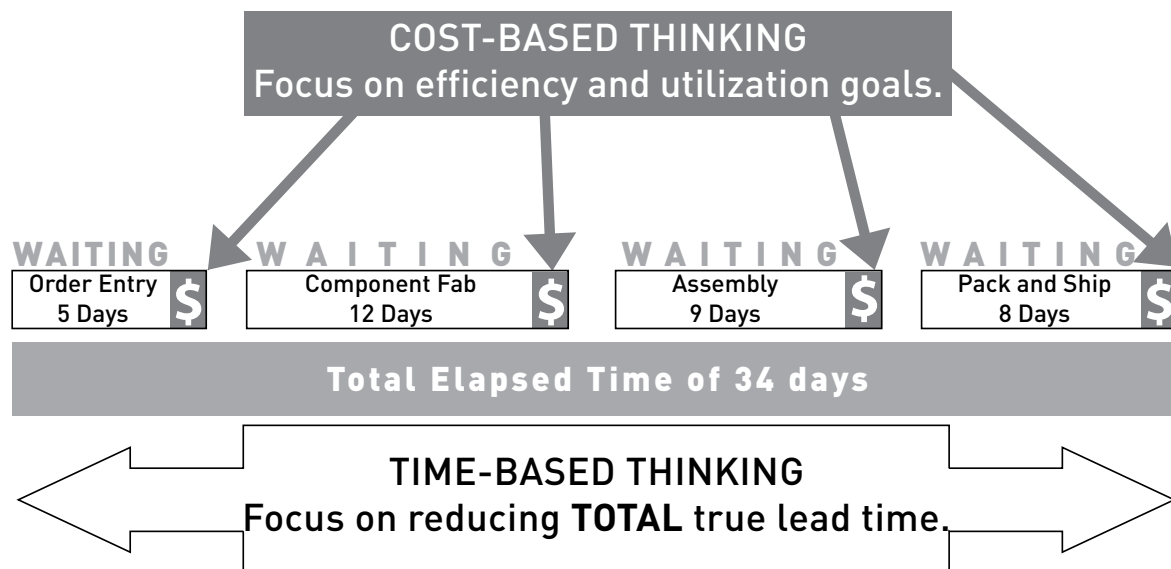
Shift from Cost-Based Thinking to Time-Based Thinking. Pgs. 21 & 22.

Most manufacturing companies allocate overhead to products using fairly simplistic cost-based thinking with amounts based on Direct-Labor and/or Machine conversions costs.

The true lead-time for most products typically includes less than 5% value-added processing, with the remainder being “white space” where no value is added (see figure below). Cost-based Accounting systems do not connect the costs associated with this non-value added “white

space” to specific products. Consequently, they do not predict the impact of reducing true lead-time on overall factory costs. Time-based thinking recognizes that overhead costs should not be based solely on a product’s value-added conversion cost but to the entire MCT.

In a typical US factory the total of all direct-labor cost is only around 10%. Thus optimizing this section of the operation might impact only this 10%. On the other hand, overhead can account for 40% or 50% of the cost of goods sold. Through a company-wide focus on MCT reduction and application of time-based thinking, you achieve a huge reduction in overhead activities and costs.



Critical Concept 3:

Systems dynamic principles (rather than utilization rates) are the crucial consideration in the deployment of resources (pages 71-76).

- ▶ An \$8 million Landing gear is used only about 60 minutes out of a 4 hour flight for 25% utilization rate. However, the landing gear utilization rate is irrelevant because it functions as part of an entire system (the aircraft). In implementing cells the correct question is not “What is the utilization of these machines?” but rather “What is the cost of this total system?” and “What is the return we expect to get from it?”
- ▶ As resources get busy waiting time increases. For example, a supermarket check-out line that might take 5 minutes to get through on a normal weekday might take an hour to get through on the day before Thanksgiving.
- ▶ Cost-based thinking drives towards 100% utilization. However, this has the unintended consequence of increasing cost. Why? Because maximizing utilization drives up lead-times which, in turn increases overall cost. (see Critical Concept one).
- ▶ Strategically planning for spare capacity reduces overall costs and increases profitability because it reduces waste associated with long true lead times (see Fig. 1).
- ▶ Why do you need to strategically plan for spare capacity? Why can't you operate at full utilization without any wasted resource? One word: variability. Most executives

understand this but they don't understand the strong interplay between variability, utilization and the enormous resulting impact of both of these on increasing total true lead-time (MCT) and costs.

- ▶ Principles to implement the four structural changes to support time-based production are discussed on pages. 47- 60. These include:
 - ▶ Quick Response Cells (co-located and dedicated resources for specific segments of production which can operate effectively in a "low volume, high-mix" environment).
 - ▶ Team ownership of the processes within the cells.
 - ▶ Significant investment in cross-training.
- ▶ Relentless focus on MCT reduction.
- ▶ Multiple tactics to reduce flow time are listed and discussed (pages 83-98).
- ▶ The application of time-based thinking to the non-production segments of the enterprise, such as:
 - ▶ Office Operations (pages 106-123).
 - ▶ Material Planning (pages 123-128).
 - ▶ Purchasing and Supply Management (page 142-155).
 - ▶ New Product Introduction (156- 161).

Critical Concept 4:

Accounting Strategies can be used to Support Time-based Thinking.

- ▶ Two models are available for estimating improvement project cost impact potential:
 - ▶ “Power of Six” Rule of Thumb, pgs. 165-168 (see Exhibit1).
 - ▶ Value per Day of MCT, pgs. 173-180:

The following accounting practices, described in detail on pages 180-190, are consistent with GAAP yet strategically support time-based thinking. These can be used independently but will have a synergistic effect if applied in combination.

- ▶ Use strategic overhead allocation.
 - ▶ Determining actual resource allocation for each processing area. This should lower overhead rates for Cells.
 - ▶ Create a strategic overhead pool to collect unabsorbed overhead, i.e., overheads

that previously have incorrectly been assigned to Cells.

- ▶ Assign overhead based on more than just Direct Labor.
 - ▶ Quantify key processes that are required for jobs and cost those out directly to process areas and Cells.
- ▶ Reassign some overhead costs specifically to large batches.
 - ▶ If you run a batch of 500 when the customer needs 100 the extra 400 produced will get allocated additional burden. This provides an incentive to run smaller batches.
- ▶ Apply overhead at the time of shipping.
 - ▶ This will also promote aligning production with demand and penalize overproduction.
- ▶ Apply overhead based on MCT (or other similar measures with a clear connection to MCT).



Project	Requested Investment	Required MCT reduction to justify project	Estimated MCT reduction	Comments
Office Cell	\$30K	3 days	8 days	Exceeds target
Fabrication Cell	\$200K	20 days	15 days	Needs 5 more days for approval
Assembly Cell	\$90 K	9 days	11 days	Exceeds target
Supply Chain	\$150 K	15 days	22 days	Exceeds target

Exhibit 1- Cost Impact of MCT Reduction Chart

The Power of Six rule is a rule-of-thumb cost impact estimator for MCT reduction. The chart below is developed from it and shows percent MCT reduction correlated with Cost Reduction based on a compilation of industry-based MCT reduction projects.

MCT Reduction	Cost Reduction	MCT Reduction	Cost Reduction	MCT Reduction	Cost Reduction
1%	0.2%	34%	6.7%	67%	16.9%
2%	0.3%	35%	6.9%	68%	17.3%
3%	0.5%	36%	7.2%	69%	17.8%
4%	0.7%	37%	7.4%	70%	18.2%
5%	0.9%	38%	7.7%	71%	18.7%
6%	1.0%	39%	7.9%	72%	19.2%
7%	1.2%	40%	8.2%	73%	19.6%
8%	1.4%	41%	8.4%	74%	20.1%
9%	1.6%	42%	8.7%	75%	20.7%
10%	1.7%	43%	9.0%	76%	21.2%
11%	1.9%	44%	9.2%	77%	21.8%
12%	2.1%	45%	9.5%	78%	22.3%
13%	2.3%	46%	9.8%	79%	22.9%
14%	2.5%	47%	10.1%	80%	23.6%
15%	2.7%	48%	10.3%	81%	24.2%
16%	2.9%	49%	10.6%	82%	24.9%
17%	3.1%	50%	10.9%	83%	25.6%
18%	3.3%	51%	11.2%	84%	26.4%
19%	3.5%	52%	11.5%	85%	27.2%
20%	3.7%	53%	11.8%	86%	28.0%
21%	3.9%	54%	12.2%	87%	28.9%
22%	4.1%	55%	12.5%	88%	29.8%
23%	4.3%	56%	12.8%	89%	30.8%
24%	4.5%	57%	13.1%	90%	31.9%
25%	4.7%	58%	13.5%	91%	33.1%
26%	4.9%	59%	13.8%	92%	34.4%
27%	5.1%	60%	14.2%	93%	35.9%
28%	5.3%	61%	14.6%	94%	37.5%
29%	5.6%	62%	14.9%	95%	39.4%
30%	5.8%	63%	15.3%	96%	41.6%
31%	6.0%	64%	15.7%	97%	44.3%
32%	6.2%	65%	16.1%	98%	48.0%
33%	6.5%	66%	16.5%	99%	53.7%

Note: Approximately one-third of the projected Cost Reduction will likely be in shorter-term Direct Costs. The remainder will be available from Overhead Costs, which may require organization and accounting changes and tracking over time to document.



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2601 Crossroads Drive, Suite 145 • Madison, Wisconsin 53718-7923 • 877.856.8588 • www.wmep.org