Session 3: Process and Financial Flow Analysis

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UIC Business
IDS 532: Introduction to Operations Management

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Last class

1. Buildup graphs
2. Capacity expansion
3. Managing product mix
4. Linear programming

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This class

1. Linking financial metrics with operational metrics through process analysis
2. Identifying key drivers and targets for improvement
3. Reengineering
4. Critical path

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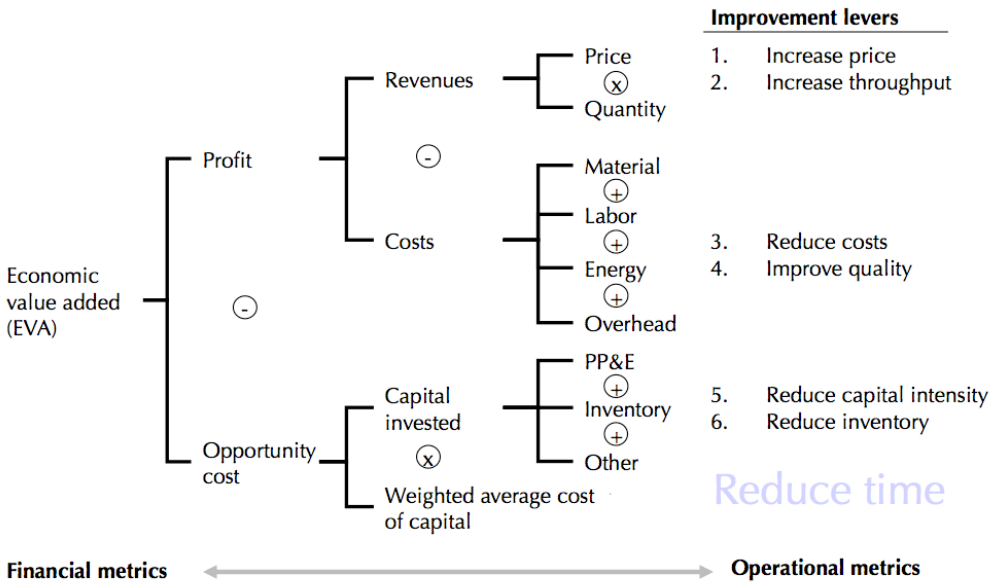
The business imperative: creating economic value



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ROIC: Return on invested capital

$$\begin{aligned}\text{EVA} &= \text{Profit - Opportunity cost of invested capital}\\ &= \text{Profit - WACC} \times \text{Invested Capital}\\ &= \text{Invested Capital} \times \left(\frac{\text{Profit}}{\text{Invested Capital}} - \text{WACC}\right)\\ &= \text{Invested Capital} \times (\text{ROIC - WACC}),\end{aligned}$$

where $\text{ROIC} = \dfrac{\text{Profit}}{\text{Invested Capital}}$.

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CRU Computer Rentals

- Define their business.
- What is the business issue they are facing?

Today: Diagnose what went wrong, assess ideas for improvement.

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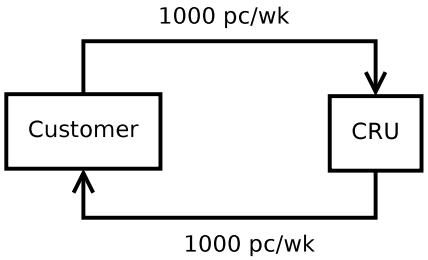
"Big Picture" Process



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Summary of Process/Financial Flows

- The business flow paradigm links operational measures to financial flows
  - Incorporates both revenue and cost sides
  - Profit, EVA, ROIC
  - Highlights key operational measures for your business.
- Use it to identify, value, and prioritize improvement areas
  - Performance measures: need more than only "utilization"
  - Target customer segments and internal operations
- On the analysis side:
  - Distinguish throughput versus cycle-time driven financials
  - Analyze different routes and product segments

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IBM Credit

What is the main problem at IBM Credit?

What are the causes of the problem at IBM Credit?

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IBM Credit

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IBM Credit: Lessons

Causes of Cycle Time in a Serial Process:

- Batching: amortizing fixed cost over a batch of items
- Processing Time Variance
- Arrival Stream Variance
- Capacity imbalances:
  - Capacity Fluctuations: absenteeism, scheduling, ...
  - Systematic Bottleneck: A "Herbie"
- Value-add processing time: often very small

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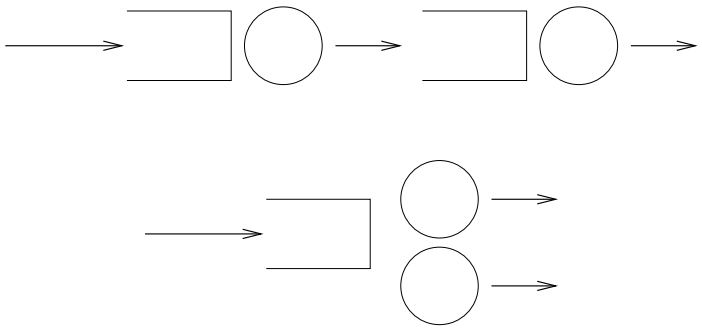
IBM Credit: Fixing the Process

Reengineering: specialists → generalists



- Workers were able to be multi-trained with technology support
- Batching eliminated
- Effects of processing time variance and imbalances mitigated:
  - "Eliminates idleness while there's a queue"

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IBM Credit: Dramatic Impact

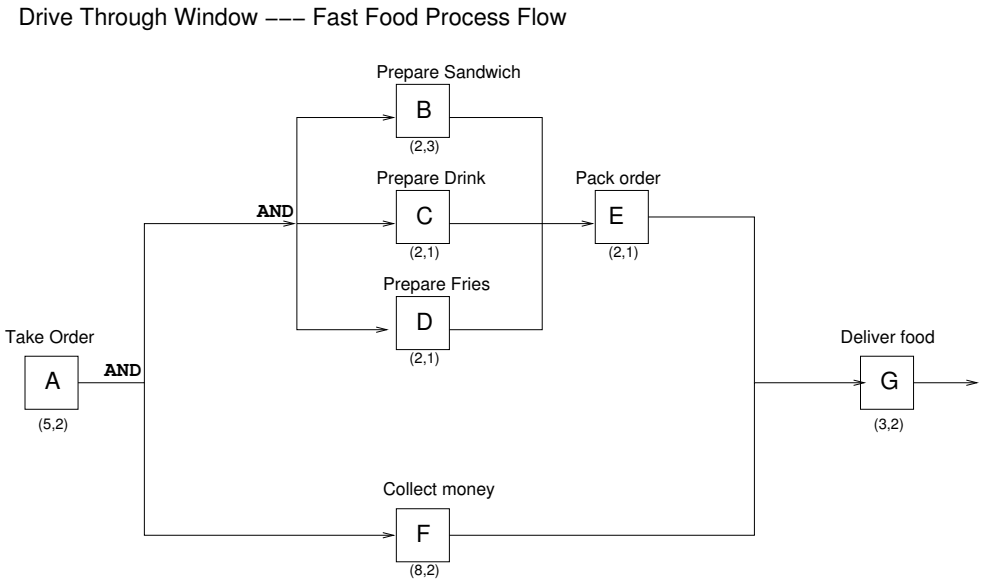
- CT reduced from 6 days to 4 hours!
- Throughput increased a hundredfold!

Critical Path

Whereas capacity is determined by bottlenecks, cycle-time is determined by the cricital path.

Definition
The critical path is the longest path through a process flow through which all jobs must pass.

Critical Path: Example



1. What is the critical path? What is it's length? A,F,G. 22 minutes.
2. What is the capacity of the system? B. 1/3 orders/minute.

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Critical Path: Lessons

- How to find it
- Critical path includes waiting time
  – capacity does not include waiting time
- Bottleneck may not be on the critical path
- Levers to shorten:
  pre-process, parallelize, reduce CT on critical activities

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