Strengthening SAFe’s Use of CoD

2019 SAFe Summit
San Diego, CA
October 3-4, 2019
Today’s Objectives

1. Review the current state of SAFe’s use of CoD and WSJF.

2. Identify some areas where it has not yet achieved its full potential.

3. Proposal some practical ways to strengthen the current approach.

4. Provide some experience-based shortcuts for experimenting with these ideas.
Cost of Delay (CoD)
Setting the context – Lean Portfolio Management
SAFe has legitimized the use of CoD as a tool for setting priorities.

It creates a relative CoD using a simplified weighted three-part model:
- User Business Value (UBV)
- Time Criticality (TC)
- Risk Reduction (RR) and/or Opportunity Enablement (OE)

Its output is a pure number, and not linked to quantified financial value.

\[
\text{WSJF} = \frac{\text{Cost of Delay}}{\text{Job Duration (Job Size)}}
\]
SAFe CoD

Standard P&L Value

User Business Value

Value Not Shown on Standard P&L

Time Criticality

Opportunity Enablement Risk Reduction

Score as Fibonacci Number

X 1/3

Score as Fibonacci Number

X 1/3

Score as Fibonacci Number

X 1/3

Cost of Delay
Pros and Cons of SAFe Approach

- **Pros**
  - It’s the first large scale use of CoD as a tool for prioritization.
  - The approach can be used by people who understand nothing about finance.
  - It completely eliminates the need for detailed economic calculations.
  - It allows prioritization to be done with no involvement from Finance.
Cons

− It measures relative CoD as a pure number, but not in economic terms.

− Ranks do not translate to economic measures like $ per month of delay.

− Ranks are not comparable between projects or release trains.

− Ranks can’t be used to compete with other ways of spending money.

− Absence of Finance involvement leads to absence of Finance support.

− This results in “Second Class” priorities when compared to economic methods.
Answers the question, “What does delay cost me?

- By how much will Life-Cycle Pretax Profit decrease if I delay the launch of this product?
- It takes the perspective of the shareholder
- Which gets the attention of Top Management and Finance.

Measured in $ per month.

It is normally done at project level.

It is done as one of many sensitivities.

- We always have multiple important objectives that interact including schedule, cost, and performance
CoD Measures the Perishability of Our Economic Opportunity

Product Availability Date

Life Cycle Profit *

Product A

Product C

Delay

Profit Loss

CoD A

CoD C?
Classic CoD

Baseline Proforma P&L

Revised Proforma P&L for Delay of X months

Life-Cycle Profit Difference

Convert to Sensitivity Factor

Life-Cycle Pretax Profit Dollars

Life-Cycle Pretax Profit Dollars per month of delay
Measuring Value

- When a product is sold in a marketplace Life-Cycle Revenue is the preferred measure of economic value.

- When there is no external market one must find another measure of value.
  - In most cases someone has answered the question does the benefit of the project exceed its cost.
  - A very common approach for assessing the value of an internal project is to compare the economic difference between the proposed solution the prior (current) solution.

- It is unlikely that value cannot be calculated, somewhat likely it has not been calculated, and highly likely that it has been calculated but not disseminated.
CoD is One Sensitivity

Create Baseline Model

- Model Expense Overrun
- Model Cost Overrun
- Model Value Shortfall
- Model Schedule Delay

Determine Total Profit Impact of Missing a Goal

Calculate Sensitivity Factors
The Model Output

Life-Cycle Profit Impact

<table>
<thead>
<tr>
<th>1 Percent Expense Overrun</th>
<th>1 Percent Product Cost Overrun</th>
<th>1 Percent Value Shortfall</th>
<th>1 Month Delay</th>
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<tbody>
<tr>
<td>-$40,000</td>
<td>-$150,000</td>
<td>-$100,000</td>
<td>-$500,000</td>
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</table>
We Compete with Intuition

Range of Cost of Delay Estimates

- Quality Analysis: 1.2:1
- Average Analysis: 2:1
- Best Case Intuition: 10:1
- Average Intuition: 50:1
- Poor Intuition: 200:1

Source: Reinertsen & Associates Clients
Economic CoD
Some Details
Baseline Scenario

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<tbody>
<tr>
<td></td>
<td></td>
<td>-4% Per Qtr</td>
<td>$3,000 $2,880 $2,765 $2,654 $2,548 $2,446 $2,348 $2,254 $2,164</td>
<td>$ - $ - $2,764,800 $5,308,416 $10,192,159 $9,784,472 $4,696,547 $2,254,342 $ - $35,000,736</td>
<td>-0.5% Per Qtr</td>
<td>$900 $896 $891 $887 $882 $878 $873 $869 $865</td>
<td>70% 69% 68% 67% 65% 64% 63% 61%</td>
<td>$1,000,000 $1,000,000 $1,000,000 $1,000,000 $1,000,000 $1,000,000 $1,000,000 $1,000,000 $8,000,000</td>
<td>25% of Revenue</td>
<td>$ - $ - $691,200 $1,327,104 $2,548,040 $2,446,118 $1,174,137 $563,586 $ - $8,750,184</td>
<td>25% of Revenue</td>
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<td>9 Total</td>
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<td>Assume</td>
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<td>1,000</td>
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<td>4,000</td>
<td>4,000</td>
<td>2,000</td>
<td>1,000</td>
<td>-</td>
<td>14,000</td>
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</table>

Unit Sales: 1,000, 2,000, 4,000, 2,000, 1,000, -
Price Erosion Rate: -4% Per Qtr
Average Sales Price: $3,000, $2,880, $2,765, $2,654, $2,548, $2,446, $2,348, $2,254, $2,164
Sales Revenue: $ - , $ - , $2,764,800, $5,308,416, $10,192,159, $9,784,472, $4,696,547, $2,254,342, $ - , $35,000,736
Cost Improvement: -0.5% Per Qtr
Unit Cost: $900, $896, $891, $887, $882, $878, $873, $869, $865
Cost of Sales: $ - , $ - , $891,023, $1,773,135, $3,528,538, $3,510,896, $1,746,671, $868,969, $ - , $12,319,230
Gross Margin: $ - , $ - , $1,873,778, $3,535,281, $6,663,621, $6,273,577, $2,949,876, $1,385,374, $ - , $22,681,506
Percent Gross Margin: 70%, 69%, 68%, 67%, 65%, 64%, 63%, 61%
Fixed Op Expenses: $1,000,000, $1,000,000, $1,000,000, $1,000,000, $1,000,000, $1,000,000, $1,000,000, $8,000,000
Variable Op Expenses: 25% of Revenue
Total Op Expenses: $1,000,000, $1,000,000, $1,000,000, $1,000,000, $1,000,000, $1,000,000, $1,000,000, $16,750,184
Operating Profit: $(1,000,000), $(1,000,000), $182,578, $1,208,177, $3,115,581, $2,827,459, $775,740, $(178,212), $(5,931,322)
Cumulative Op Profit: $(1,000,000), $(2,000,000), $(1,817,423), $(609,245), $(2,506,336), $(5,333,794), $(6,109,534), $(5,931,322), $(5,931,322)
Typical Delay Scenario

Quarterly Sales

Quarterly Sales Comparison:
- Baseline
- Delayed

Quarterly Sales Chart:
- X-axis: Quarter
- Y-axis: Sales
- Comparison of baseline and delayed sales for quarters 2 to 9.
## Delayed Scenario

<table>
<thead>
<tr>
<th>Assume</th>
<th>Quarter</th>
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<td>7</td>
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<tr>
<td><strong>Unit Sales</strong></td>
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<td>1,000</td>
<td>3,000</td>
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<td>1,000</td>
<td>-</td>
<td>-</td>
<td>8,000</td>
</tr>
<tr>
<td><strong>Price Erosion Rate</strong></td>
<td>-4%</td>
<td>Per Qtr</td>
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<tr>
<td><strong>Average Sales Price</strong></td>
<td>$3,000</td>
<td>$2,880</td>
<td>$2,765</td>
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<td>$2,446</td>
<td>$2,348</td>
<td>$2,254</td>
<td>$2,164</td>
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</tr>
<tr>
<td><strong>Sales Revenue</strong></td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
<td>$2,654</td>
<td>$2,644</td>
<td>$7,644</td>
<td>$7,338</td>
<td>$2,348</td>
<td>$-</td>
<td>$19,984,955</td>
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<td><strong>Cost Improvement</strong></td>
<td>-0.5%</td>
<td>Per Qtr</td>
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<td></td>
<td></td>
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<tr>
<td><strong>Unit Cost</strong></td>
<td>$900</td>
<td>$896</td>
<td>$891</td>
<td>$887</td>
<td>$882</td>
<td>$878</td>
<td>$873</td>
<td>$869</td>
<td>$865</td>
<td></td>
</tr>
<tr>
<td><strong>Cost of Sales</strong></td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
<td>$886,567</td>
<td>$2,646,404</td>
<td>$2,633,172</td>
<td>$873,335</td>
<td>$-</td>
<td>$-</td>
<td>$7,039,478</td>
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<tr>
<td><strong>Gross Margin</strong></td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
<td>$1,767,641</td>
<td>$4,997,715</td>
<td>$4,705,183</td>
<td>$1,474,938</td>
<td>$-</td>
<td>$-</td>
<td>$12,945,477</td>
</tr>
<tr>
<td><strong>Percent Gross Margin</strong></td>
<td>70%</td>
<td>69%</td>
<td>68%</td>
<td>67%</td>
<td>65%</td>
<td>64%</td>
<td>63%</td>
<td>61%</td>
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<tr>
<td><strong>Fixed Op Expenses</strong></td>
<td>$-</td>
<td>$1,000,000</td>
<td>$1,000,000</td>
<td>$1,000,000</td>
<td>$1,000,000</td>
<td>$1,000,000</td>
<td>$1,000,000</td>
<td>$-</td>
<td>$-</td>
<td>$6,000,000</td>
</tr>
<tr>
<td><strong>Variable Op Expenses</strong></td>
<td>25%</td>
<td>of Revenue</td>
<td>$-</td>
<td>$-</td>
<td>$663,552</td>
<td>$1,911,030</td>
<td>$1,834,589</td>
<td>$587,068</td>
<td>$-</td>
<td>$-</td>
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<tr>
<td><strong>Total Op Expenses</strong></td>
<td>$-</td>
<td>$1,000,000</td>
<td>$1,000,000</td>
<td>$1,663,552</td>
<td>$2,911,030</td>
<td>$2,834,589</td>
<td>$1,587,068</td>
<td>$-</td>
<td>$-</td>
<td>$10,996,239</td>
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<tr>
<td><strong>Operating Profit</strong></td>
<td>$-</td>
<td>$(1,000,000)</td>
<td>$(1,000,000)</td>
<td>$104,089</td>
<td>$2,086,686</td>
<td>$1,870,594</td>
<td>$(112,130)</td>
<td>$-</td>
<td>$-</td>
<td>$1,949,238</td>
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<tr>
<td><strong>Cumulative Op Profit</strong></td>
<td>$-</td>
<td>$(1,000,000)</td>
<td>$(2,000,000)</td>
<td>$(1,895,911)</td>
<td>$190,774</td>
<td>$2,061,368</td>
<td>$1,949,238</td>
<td>$1,949,238</td>
<td>$-</td>
<td>$5,931,322</td>
</tr>
</tbody>
</table>

Baseline: $5,931,322
Change: $3,982,084
Per Month: 1,327,361

**CoD = $1.33 Million per month**
SAFe’s Non-P&L Factors

- User Business Value – already captured in Basic P&L
- Time Criticality – already captured in schedule delay variation
- Risk Reduction and Opportunity Enhancement
  - Can be estimated economically
  - Assess risk reduction as equivalent insurance value, What is fair price to pay to eliminate this risk? Probability times consequences.
  - Assess Opportunity Enhancement as valuation of an option. What is expected value of profit stream from this option?
Risk Reduction Scenario

- A new regulatory standard could block sale of our product to 10 percent of our customers. By spending $100K we can preemptively meet this requirement.

- Note that this is 1.2 % of total project profit.

- Total Revenue $20 Million
- Variable Margin 40% $8 Million
- Margin at risk 10% $0.8 Million
- Probability of occurrence 20%
- Expected Economic Damage $160,000
- Net Insurance Benefit ($160,000 - $100,000) = $60,000
Opportunity Enhancement Scenario

- A non-existent but potential new customer group could add 25 percent more revenue to our product. Providing for their needs would add $150,000 to development cost and 1 week to our project schedule.

- Note that this is 1.9 % of total project profit.

<table>
<thead>
<tr>
<th>Total Revenue</th>
<th>$20 Million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable Margin</td>
<td>40% → $8 Million</td>
</tr>
<tr>
<td>Potential increase</td>
<td>25% → $2 Million</td>
</tr>
<tr>
<td>Probability of occurrence</td>
<td>30%</td>
</tr>
<tr>
<td>Expected Variable Margin payoff</td>
<td>$0.6 Million</td>
</tr>
<tr>
<td>Cost of option 1/4 mo delay = $1.33 x 0.25 = $333,000 + $150,000 development expense → $483,000</td>
<td></td>
</tr>
<tr>
<td>Net Insurance Benefit</td>
<td>($600,000 - $483,000) = $117,000</td>
</tr>
</tbody>
</table>
The Economic View does not treat User Business Value and Time Criticality as separable items. It quantifies value of Time Criticality as the loss in shareholder profits caused by a delay (CoD).

User Business Value is accurately approximated by revenue but the value of this revenue to the shareholder depends the costs associated with it.
Economic CoD
Some Short Cuts
Some Short Cuts

- Estimate CoD using peak monthly Variable Margin generation rate during delay period.
- Estimate Non-P&L items as a “tax-rate” on P&L.
  - Low 1%
  - Medium 3%
  - High 10%
- When estimates feel wrong do real analysis and test your intuition against computation.
Delayed Start Costs Peak Sales

Peak Revenue = $10.192 Million/Qtr
Variable Margin* = 39.8%
Lost Margin $4.057 Million/Qtr
Cost of Delay $1.352 Million/Month

(vs. Excel Calculation $1.327 which is a staggering 2% difference)

*Variable Margin = Gross Margin – Variable Operating Expenses
WSJF

- Concept is to minimize time that high CoD jobs must wait for scarce resources to become available.

- All choices of which job to service, and which job to delay, should consider CoD.

- WSJF is used for ordering independent items.

- Weight is (Cost of Delay / Duration)

- Duration is the time a scarce resource is blocked from doing another job.

- Prioritization can be done with rough CoD and durations.
Independent vs Dependent Items

Only independent items produce CoD savings from early delivery.

VS

Dependent items cannot be delivered until associated work is complete and therefore cannot produce CoD savings.

- Nevertheless, the Sequencing of dependent items also has an economic impact.
  - The sequence should be chosen to minimize expected rework. (e.g. socks before shoes)

- WSJF at feature level requires another presentation.
A Possible Approach

Cost of Delay

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<tr>
<th></th>
<th>High</th>
<th>Medium</th>
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<td>Medium</td>
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<tr>
<td>Short</td>
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</table>

Duration

- Long
- Medium
- Short
CoD can be done with Fibonacci numbers or with dollars
If you don’t calculate CoD, people will imagine one
WSJF is used for ordering independent items
The P&L impact of the project usually is the dominant share of its value
Short cuts can produce good enough CoD quite quickly
Even rough approximations of CoD are sufficient to prevent big prioritization mistakes
Using Dollars to quantify CoD is not nearly as hard as it appears.
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