

Using the Operations & Cash Flow Domain to Improve Financial Performance



Business Dynamics & Research, Ltd.

consultation d'avant garde

The Operations & Cash Flow Domain

The primary source of business and financial data

There are three basic business activities. We buy things, consume them, and create output. The output is wide ranging and includes, for instance, products, services provided, people hired, invoices paid, and managerial actions.

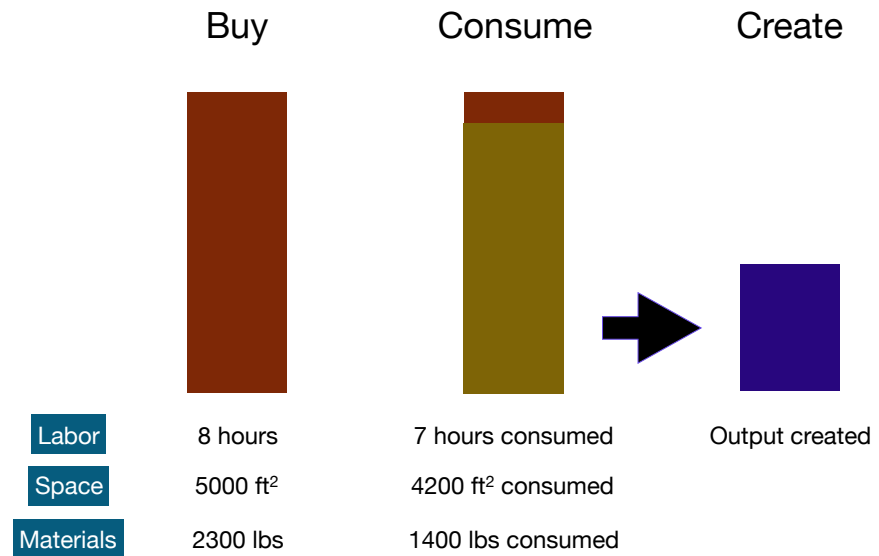
Buy

Consume

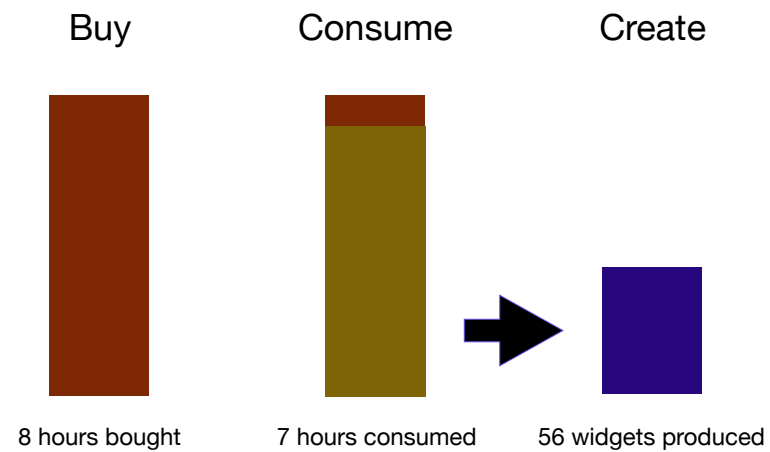
Create

This is the Operations and Cash Flow (OC) Domain. All activities and cash transactions occur in the OC Domain.

Most of what a company buys is capacity; that purchased in anticipation of demand. This includes labor, space, materials, equipment, information technology*.



An example: One person, making \$24/hour, works an eight hour shift making widgets. They were worked seven of the eight hours and made 56 widgets. 50 of the widgets were bought and paid for.



The OC Domain has all fundamental data about a company. This includes what was bought, how it was consumed, how efficiently and productively it was used, what was created, what was spent, and how much was received.



OC Domain modeling enables alignment between operations and finance

Operations and finance data come together in the OC Domain

Then someone asks, “What was our cost? Profit?”

That question is quite difficult to answer correctly



The problem this question creates

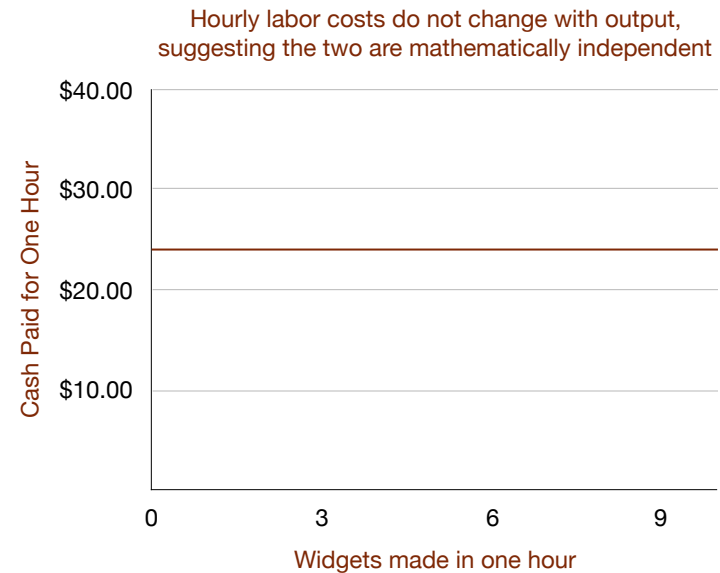
Long distance service: 10¢ per minute
Cost of ten minute long distance call: \$1.00
Local service: \$25 per month

What does a ten minute local call cost?

How do you answer this question?

Hourly labor costs change, from a cash perspective, with how much buy and not with output. In other words:

There is no mathematical relationship between hourly labor and output



There is no math relationship between what you bought and how you used it.
To calculate a cost you need the relationship.
So, what do you do?

You make one up

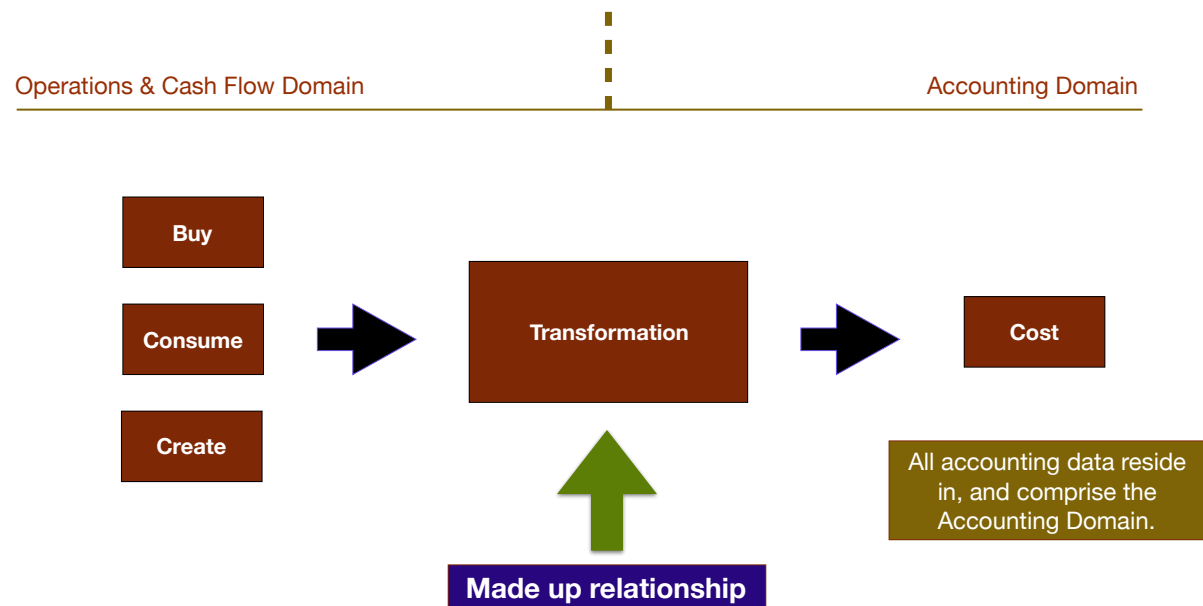
The made-up relationships have one thing in common

They're all arbitrary

The Accounting Domain

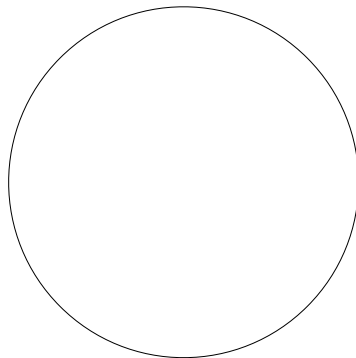
Where accounting information lives

The process of calculating a cost involves taking OC Domain data and feeding it into a transformation algorithm/function. The output helps populate the Accounting Domain.



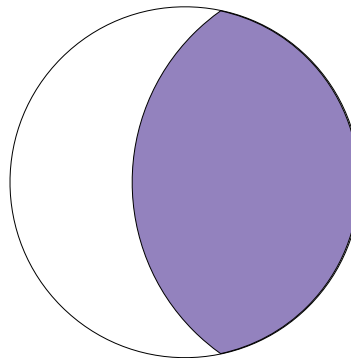
The transformation process first involves identifying a subset of OC Domain data that is considered relevant (scope). Second, the transformation takes this data and allocates/ assigns them to output. This creates an image in the Accounting Domain of the OC Domain.

Operations & Cash Flow Domain



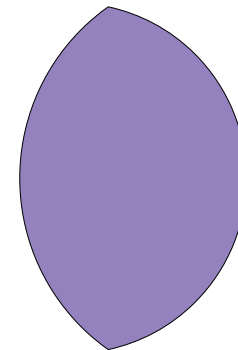
OC Domain Data

Transformation



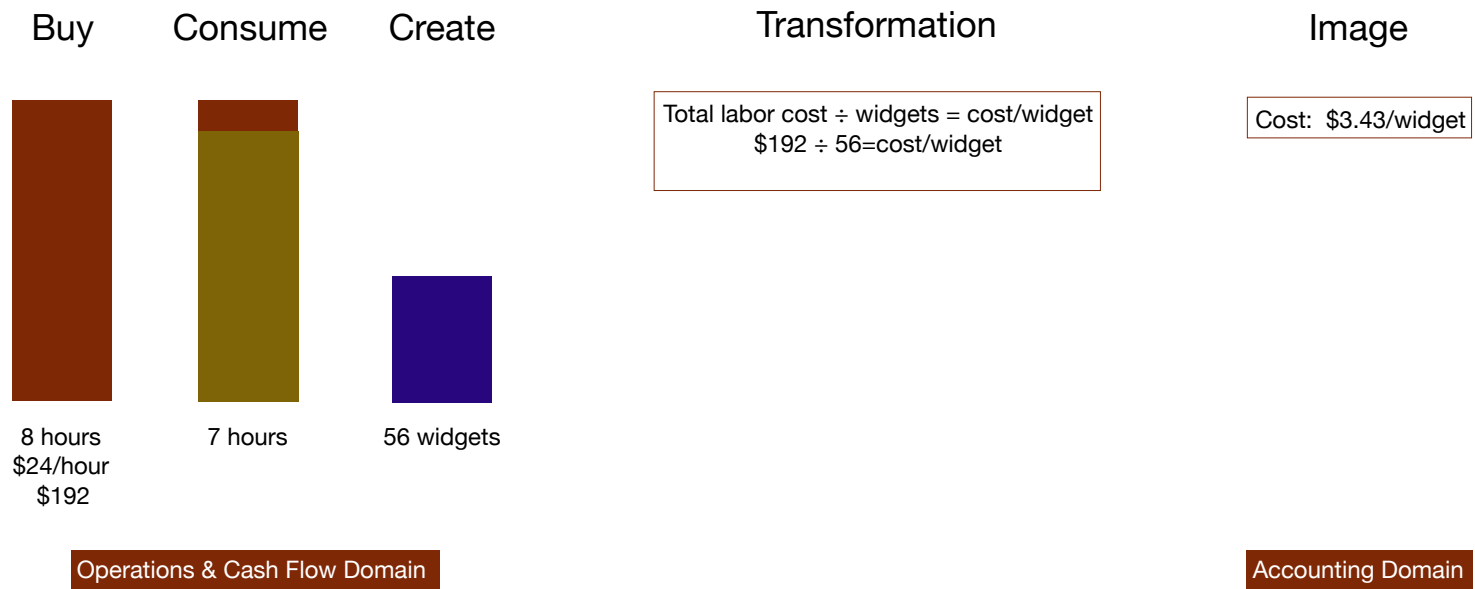
Transformation scope and
assignment algorithms

Accounting Domain



Accounting image (cost)

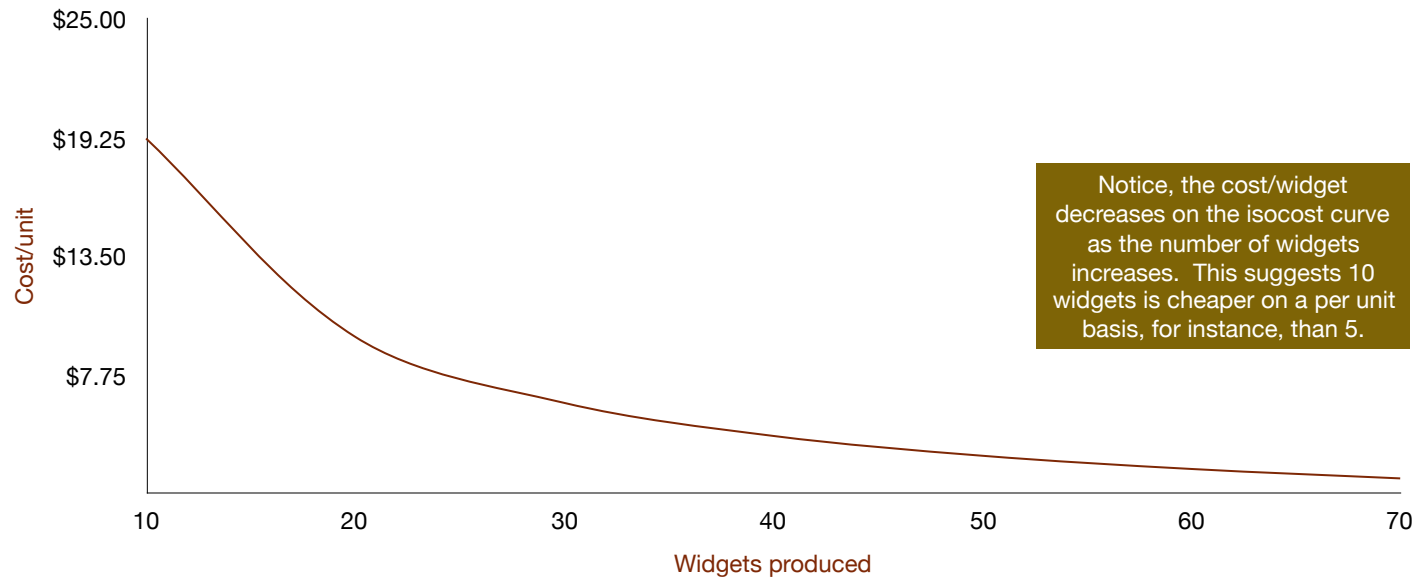
An example: The laborer works 8 hours at \$24/hour. She spends 7 hours creating 56 widgets. **One transformation** is shown below.



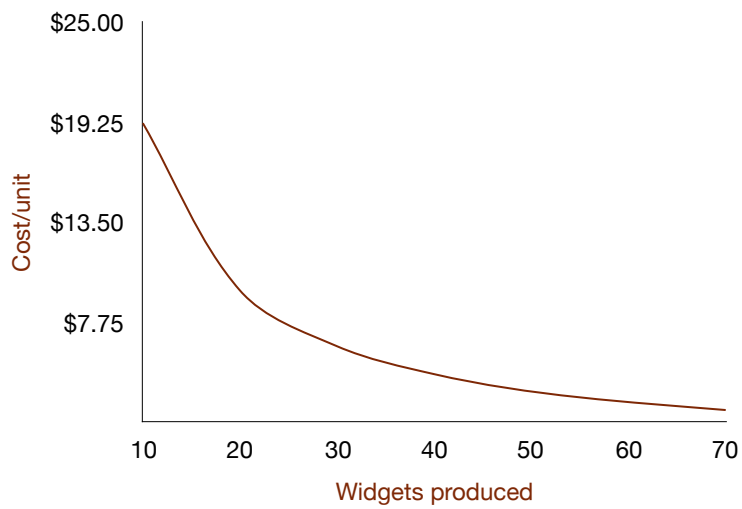
Cost/unit only exists in the Accounting Domain. It does not make mathematical sense in the OC Domain.

The image in this case was created by dividing the labor cost by output. This creates an isocost or same-cost curve. In this case the cost/widget at any output level can be calculated using this equation:

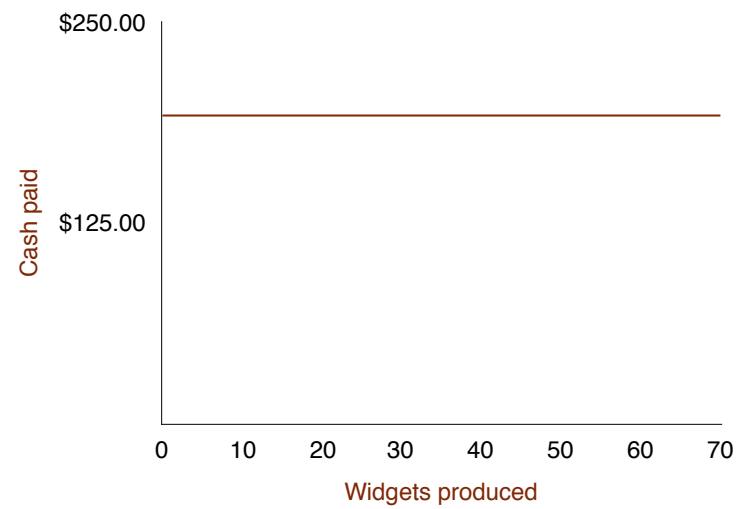
$$\text{Cost/widget} = \$192^*/\text{widgets made}$$



In the Accounting Domain, costs decreased with output. In the OC Domain, they did not change.



Accounting Domain



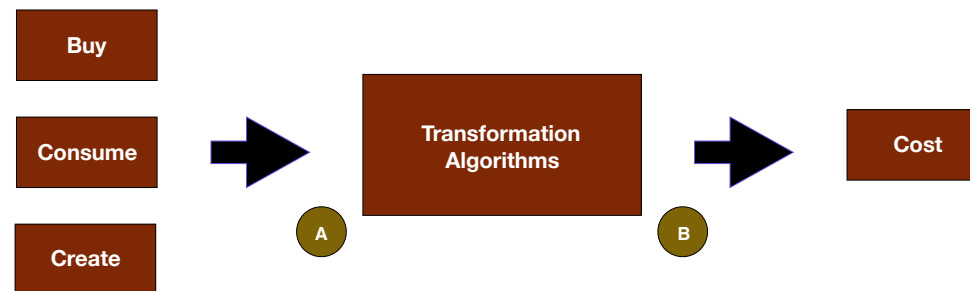
O-C Domain

What is the implication of costs going down if there has been no change in cash?

OC Domain data remain constant, even in the Accounting Domain. However, the image created from the transformation will not reflect the OC Domain or even the data subset properly.

Operations & Cash Flow Domain

Accounting Domain



The operations - cash flow domain data are the same at B as they are at A. The difference is, B is an arbitrarily selected subset of A.

Implication: Calculated costs are unnecessary from a managerial perspective. ***They provide no truly new data.***

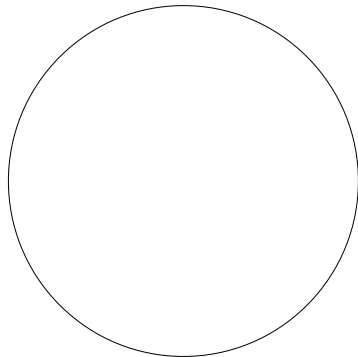
An example: Notice how the OC Domain data do not change. The only differences are the calculations made in the Accounting Domain from OC Domain data.

	OC Domain	Accounting Domain
Production	56 units	56 units
Shift	8 hours	8 hours
Productive Time	7 hours	7 hours
Price	\$5/unit	\$5/unit
Demand	50 units	50 units
Sales	\$250	\$250
"Profit"	\$58	\$78.5*

All transformation algorithms are arbitrary. You can change scope or allocation technique and create an entirely new image.

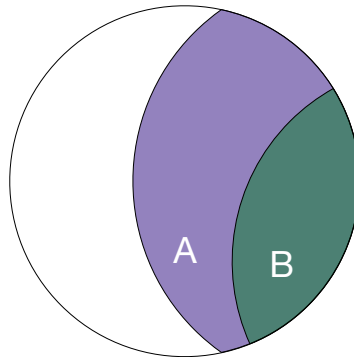
By changing the scope, we create a different completely different image of the OC Domain from the same single set of OC data

Operations & Cash Flow Domain



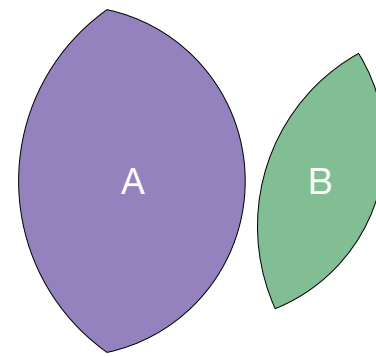
OC Domain Data

Transformation



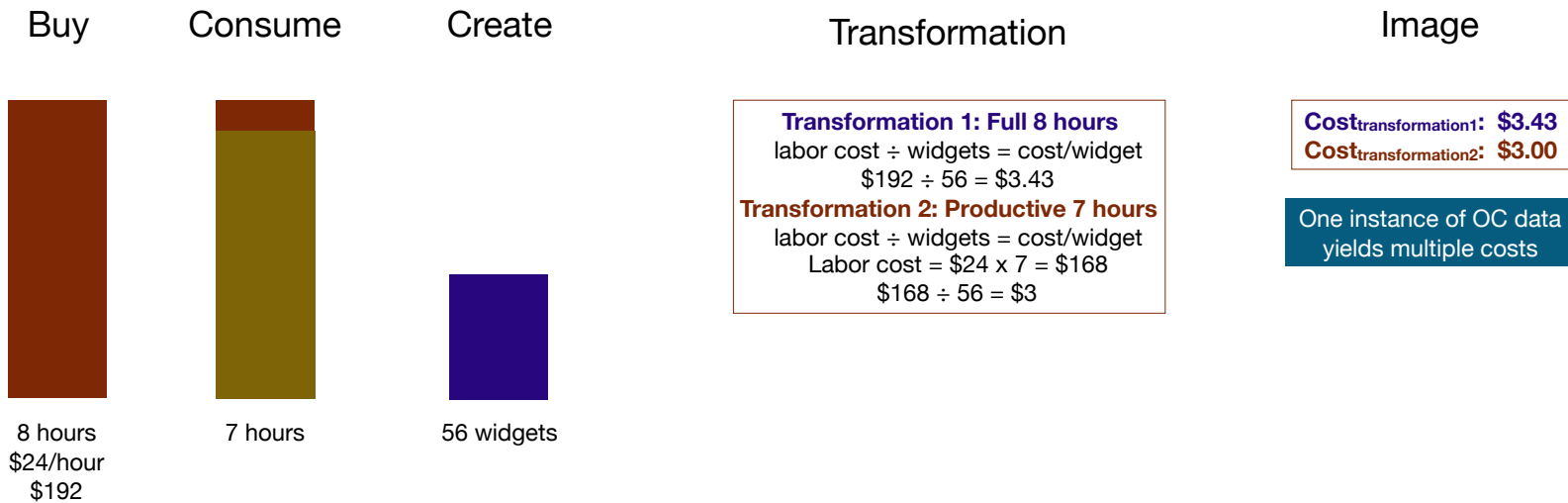
Separate transformation algorithms

Accounting Domain



Accounting images

An example: What if, instead of using the entire eight hours to calculate a cost, we used the seven productive hours?

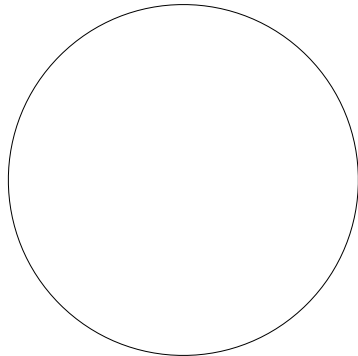


A small change in scope with the same allocation schema creates a 27% increase in profit.
The amount of cash made has not changed.

	OC Domain	Accounting Image1	Accounting Image2
Production	56 units	56 units	56 units
Shift	8 hours	8 hours	8 hours
Productive Time	7 hours	7 hours	7 hours
Price	\$5/unit	\$5/unit	\$5/unit
Demand	50 units	50 units	50 units
Sales	\$250	\$250	\$250
"Profit"	\$58	\$78.5	\$100

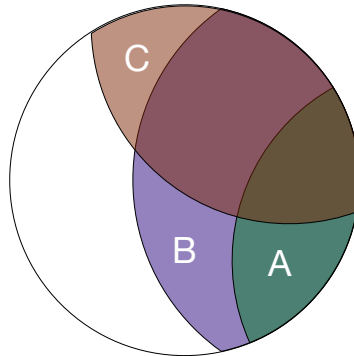
Each transformation creates a new image and, therefore, new costs from different interpretations of the same OC instance. Each new cost creates a different profit.

Operations & Cash Flow Domain



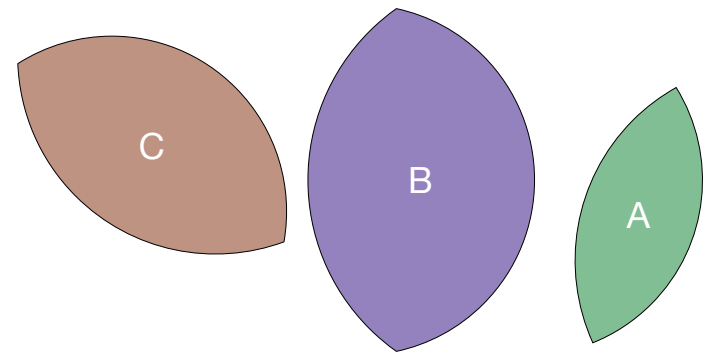
OC Domain Data

Transformation



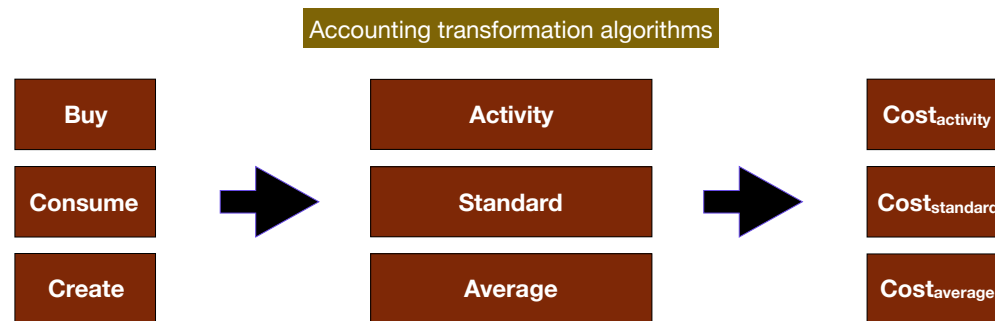
Various transformation
scope and assignment
algorithms

Accounting Domain



Accounting images

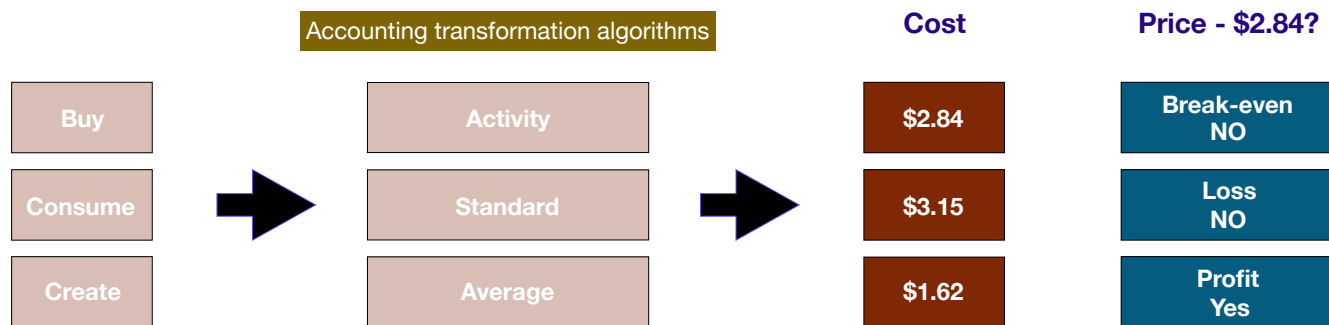
Cost allocation techniques are transformation algorithms. They all have their own approach to assigning and allocating costs, creating unique images. These images can change based on the scope of data considered.



That you can calculate any number of accounting images creates a problem

How can you trust your decisions?

Each decision made in the accounting domain is based on one of an infinite number of images one can create from a single instance in the OC Domain. Decisions that are good considering one image may not be acceptable in another.



Consider this. If this were a make vs buy analysis, how would you know you are right? One cost says keep and the other says outsource.

How can a decision you make about scope or allocation in a math formula determine how much money you made?

It can't

Implication: Profit has nothing to do with money

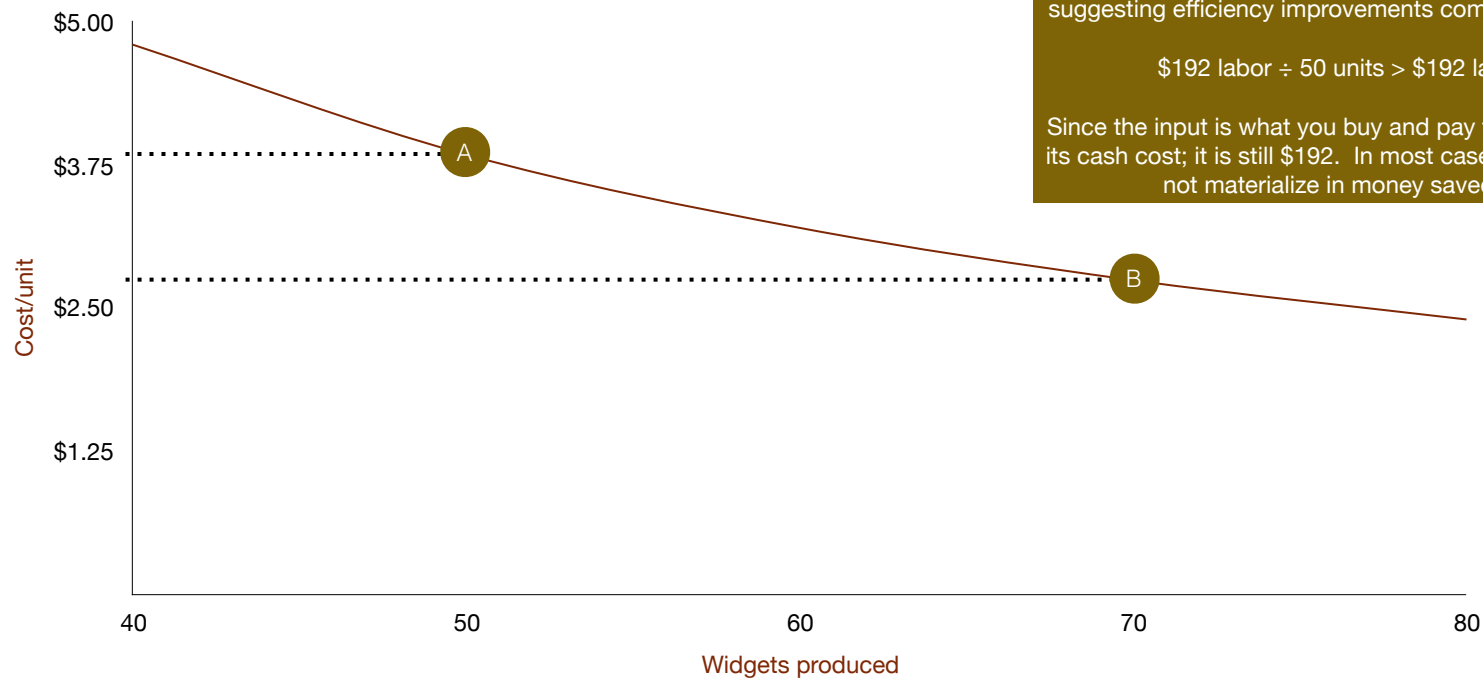
This includes product, service, and customer profit

How cost reduction activities fail

Misinterpreting the Isocost Curve

Moving along the curve

One cost reduction technique identified by consultants, Six-Sigma, lean, and IT professionals is improving efficiency, ϵ . Although the calculated cost per widget goes down which suggests a cost savings in the Accounting Domain, **there is no saving in the OC Domain**



$\epsilon \equiv \text{output} \div \text{input}$. On an isocost curve, the input is fixed suggesting efficiency improvements come from increasing output.

$$\$192 \text{ labor} \div 50 \text{ units} > \$192 \text{ labor} \div 70 \text{ units}^*$$

Since the input is what you buy and pay for, there is no reduction in its cash cost; it is still \$192. In most cases, these cost savings will not materialize in money saved as promised.

An example: By increasing output, cost per unit is reduced \$1.10 each without saving money

	Cost ₁		Cost ₂		Cost ₃
Cash labor cost	\$192	=	\$192	=	\$192
Output	50		60		70
Purchased Time	8 hours		8 hours		8 hours
Processing Time	7 hours		7 hours		7 hours
Unit Cost	\$3.84	>	\$3.2	>	\$2.74

A better alternative is to consider this information in the OC Domain

There are no false claims

In the OC Domain, improvements in efficiency can be captured without false promises of cost savings. There are several types of efficiency metrics available. Examples are below.

	Accounting Image ₁	Accounting Image ₂	Accounting Image ₃
Cash labor cost	\$192	\$192	\$192
Output	50	60	70
Purchased Time	8 hours	8 hours	8 hours
Processing Time	7 hours	7 hours	7 hours
Unit-Labor Efficiency	0.26 units/labor dollar	0.31 units/labor dollar	0.36 units/labor dollar
Hourly Output	6.25 units/hour	7.5 units/hour	8.75 unit/hour
Revenue-Production Efficiency	\$5/unit produced	\$4.17/unit produced	\$3.57/unit produced
Unit Cost	\$3.84	\$3.2	\$2.74

Example 1

Unit-Labor Cost Efficiency

Equation: Units produced ÷ \$192

Description: Considers the units of output produced given the cash investment in labor.

Use: Can be used for labor planning and output management. Direct comparable to cost/unit.

Example 2

Hourly output

Equation: Units produced ÷ 8

Description: Shows average output generated in a given hour of a shift.

Use: Production efficiency. Should not be used without considering demand. No real comparable in AC-Domain.

Example 3

Revenue for units produced

Equation: \$250 ÷ units produced

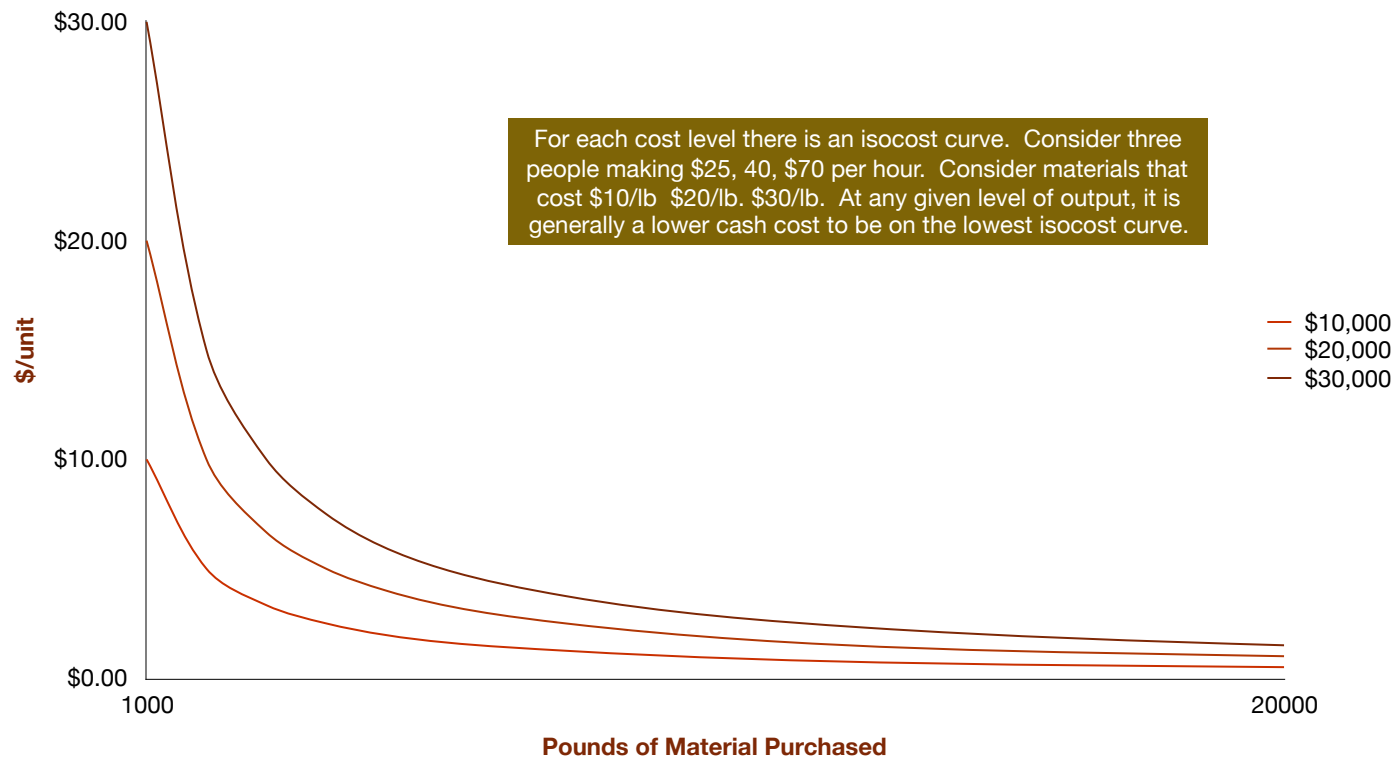
Description: Compares how much revenue is being generated given the number of units produced. When demand is exceeded, this metric decreases.

Use: Provides insight into over production and alignment with demand.

Misinterpreting the Isocost Curve

Different curves

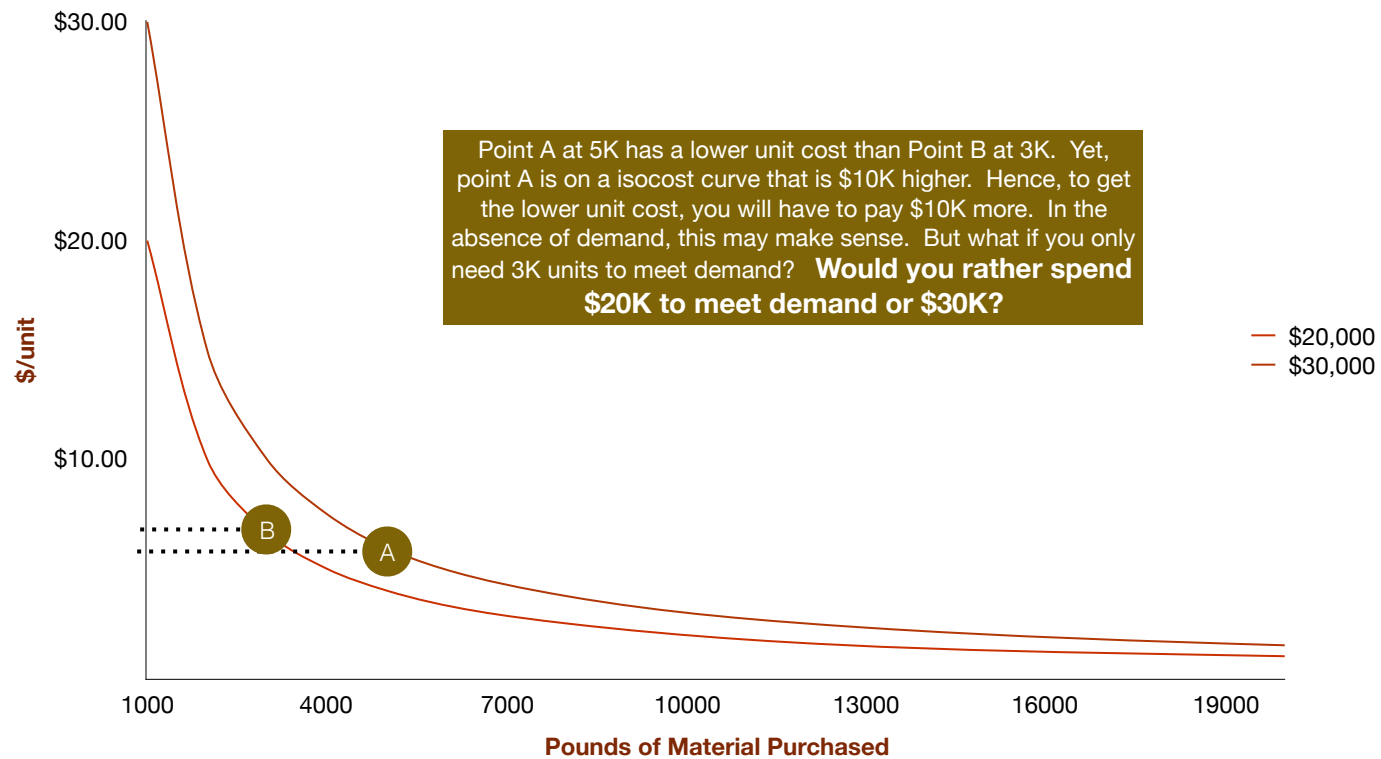
Parallel Isocost Curves for Three Investments in Inventory



Isocost curves focus on cash expenditures
Accounting doesn't consider isocost curves, which leads to a problem

You make good accounting decisions
but poor cash decisions

A lower cost isocost curve can have a higher unit cost, leading to inappropriate costing decisions.



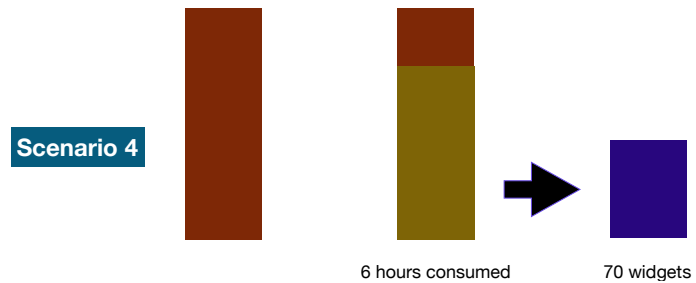
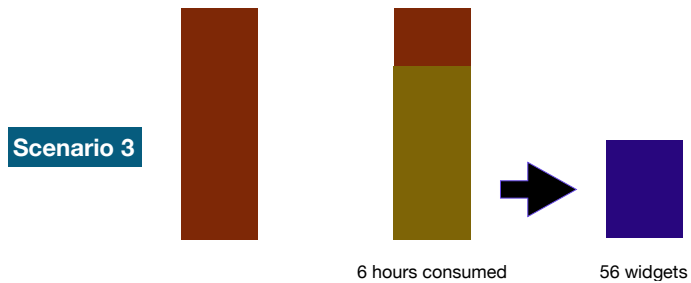
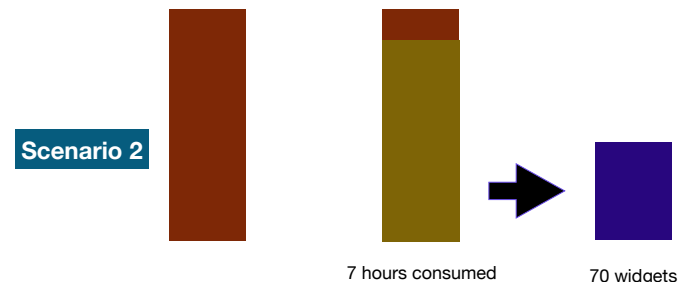
A better approach is to consider demand and cash data in the OC Domain

Demand data are not prevalent in the Accounting Domain

Maximizing Profit in the Accounting Domain

While suboptimizing cash

Which situation is best for your company if demand is for 50 widgets?



More time consumed

Less time consumed

Less output

More output

All scenarios are the same in the OC Domain. What you pay for and the revenue generated does not change across the scenarios. The wildcard is tax. When you increase your Accounting Domain profit, you are taxed more, leading to less cash overall.

	Scenario ₁	Scenario ₂	Scenario ₃	Scenario ₄
Labor	\$24/hour	\$24/hour	\$24/hour	\$24/hour
Consume	7	7	6	6
Output	56	70	56	70
Demand	50	50	50	50
Price	\$5.00	\$5.00	\$5.00	\$5.00
Revenue	\$250.00	\$250.00	\$250.00	\$250.00
Shift Labor	\$192.00	\$192.00	\$192.00	\$192.00
OC Profit	\$58.00	\$58.00	\$58.00	\$58.00
	Accounting Image ₁	Accounting Image ₂	Accounting Image ₃	Accounting Image ₄
Unit cost	\$3.00	\$2.40	\$2.57	\$2.06
Unit Margins	\$2.00	\$2.60	\$2.43	\$2.94
Total Margin	\$100.00	\$130.00	\$121.43	\$147.14
Tax	\$30.00	\$39.00	\$36.43	\$44.14
OC-Cash Flow	\$28.00	\$19.00	\$21.57	\$13.86

Implication: The worst scenario from the Accounting Domain makes the greatest amount of cash.

Misunderstanding Profit

What profit really tells you

Calculated costs in the Accounting Domain are not money

They are an opinion of the value of resources consumed

An example: 8 hours labor, 7 consumed making output. Transformation is based on using the consumption time (7 of 8 hours) and output to create the image (cost/unit). Demand is for 20 units.

	Scenario ₁	Scenario ₂	Scenario ₃	Scenario ₄
\$Labor/hr	24	24	24	24
Consume	7	7	7	7
Output	1	20	70	1000
	Accounting Image ₁	Image ₂	Image ₃	Image ₄
Revenue	\$5.00	\$100.00	\$100.00	\$100.00
Unit cost	\$168.00	\$8.40	\$2.40	\$0.17
Profit	-\$163.00	-\$68.00	\$52.00	\$96.64
OC cash	-\$187.00	-\$92.00	-\$92.00	-\$92.00

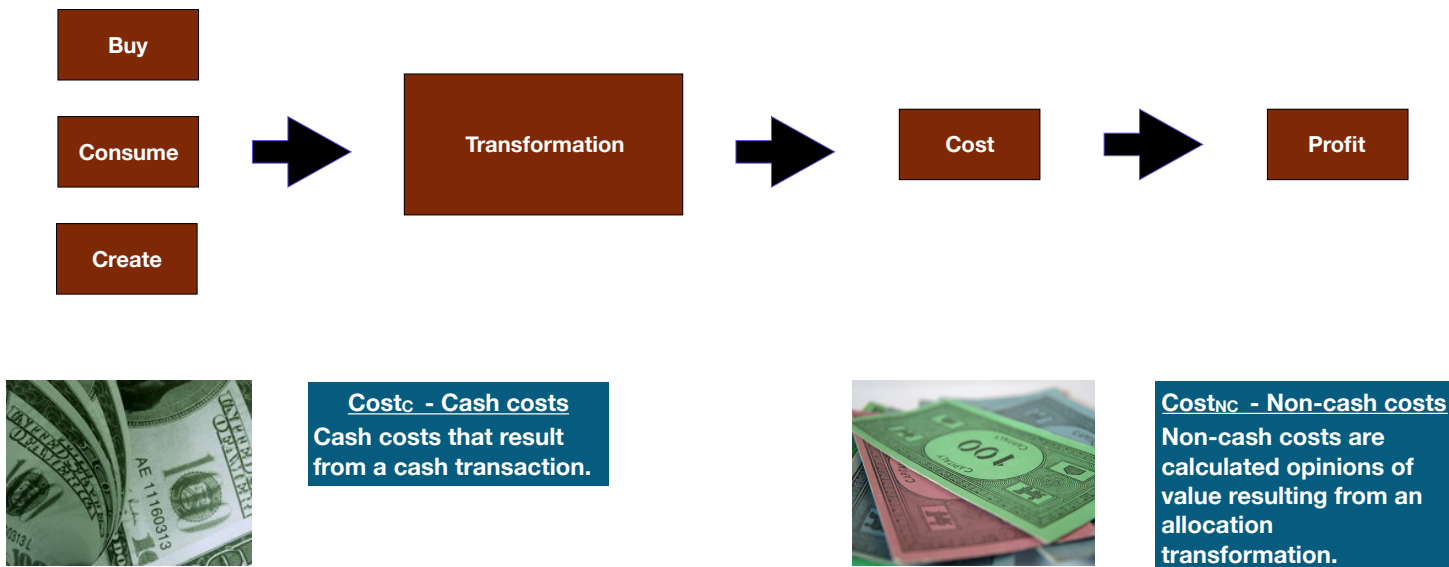
We received \$100. We spent \$192.

How did we “make” \$92.64?

Accounting Domain calculated costs and profits are not money. These non-cash costs represent an opinion value placed on the capacity consumed. For instance, the value of an hour of our laborer's time may be \$24 if 8 hours are considered and \$27.43 if 7 hours are considered.

Operations & Cash Flow Domain

Accounting Domain



Accounting Domain profit is based on bad math.* You cannot subtract an opinion from money and have the answer be money.

$$\text{Revenue} - \text{Cost} = \text{Profit}$$

$$\text{Money}^{\#} - \text{Value/Opinion} \neq \text{Money}$$

By focusing on profit, leaders lose sight of operations and cash

Take-Aways

1. Understand, model, and make decisions based on OC Domain data rather than Accounting Domain data to maximize financial performance.
2. Alignment between finance and operations happens in the OC Domain.
3. Not all costs are accounting data. Not all costs are the result of accounting analyses.
4. When talking about accounting costs and profits, it's important to understand that your image is just one of an infinite number of possible images. The only unambiguous data resides in the OC Domain.
5. When you are considering maximizing a cash flow situation, you should include factors such as demand and which isocost curve you're on. This will help keep you from false savings opportunities often pushed by folks in IT, consultants, and those who practice other productivity enhancing concepts.
6. Don't make key decisions such as make vs buy and price based on Accounting Domain data. Perform OC Domain analyses first, and if you want to understand the impact on your particular image, project out that data into the Accounting Domain to get a feel for how the change will affect information reported from the Accounting Domain.
7. Analytics models should be designed to use native OC Domain data rather than Accounting Domain data. The data inputs and outputs about your company will be more pure and accurate.



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