

HOW DOES VALUE STREAM COSTING WORK?

Value stream cost is typically calculated weekly and takes account of all the costs in the value stream. It makes no distinction between direct costs and indirect costs; all the costs within the value stream are considered direct. Costs outside of the value stream are not included in our value stream costing.

[Figure 9.1](#) shows the costs that make up the total value stream cost.

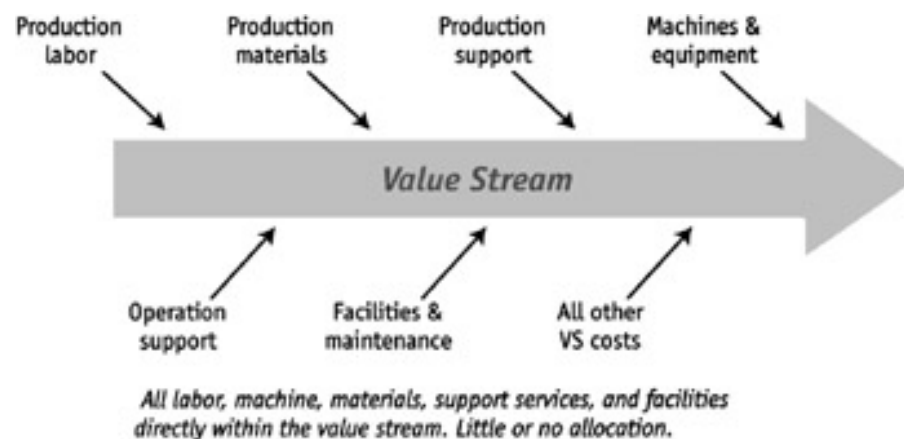


Figure 9.1: Costs included in Value Stream Costing

These include all labor costs, traditionally direct costs, and traditionally indirect costs. Employees working in the value stream are included, irrespective of whether they make the product, move materials, design the product, maintain machines, plan production, make sales, or do the accounting.

The production material costs are generally calculated from how much material has been purchased for the value stream during the week. Every time material is brought into the plant, its cost is assigned to the value stream. The total value stream material cost is the sum of everything purchased during the week. For this material cost to be valid, raw materials and work-in-process inventories must be low, and under good control. If the inventories are low, the materials brought in during the week will be used quickly and will accurately reflect the material cost of the product manufactured during the week.

Support costs, like spare parts and soft tooling, often are purchased for the value stream using a purchase credit card assigned to the value stream, so the costs are directly posted to the value stream cost/profit center. The costs of consumables, supplies, and other day-to-day expenses are similarly assigned to the value stream.

The only allocation used regularly within value stream costing is a square footage (or square meters) cost for the facility. The reason for this is to motivate the value stream team-members to reduce the amount of space used by the value stream.

The facilities cost assigned to the value stream will be the cost per foot multiplied by the amount of square feet used by the value stream. The cost per square foot is obtained by dividing the total facilities cost (the sum of the rental

payment/depreciation cost for the manufacturing building, the amount spent for utilities, building maintenance, guard and security service, etc.) by the total square feet encompassed by the manufacturing plant. The square footage occupied by the value stream includes the production area, stockroom area, and the office space area used by the people working in the value stream. There is no attempt to fully absorb the facilities costs; only the square footage used by the value stream is included.

Occasionally, the utilities costs are significant and vary considerably between value streams. In such a case, each value stream is metered and the utilities costs are applied as direct value stream costs.

The value stream cost for ECI are shown in [Figure 9.2](#).

	Material cost	Outside cost	Employee cost	Machine cost	Other cost	TOTAL COST
Customer service	–	–	\$12,108	–	–	\$12,108
Purchasing	–	–	16,145	–	–	16,145
SMT	358,512	–	17,080	16,956	20,000	412,548
Hand load/wave post	25,608	–	23,485	2,016	–	51,109
Test and rework	–	–	17,080	3,528	–	20,608
Assemble and burn-in	128,040	–	10,675	–	–	138,715
Shipping	–	–	2,669	–	–	2,669
Quality assurance	–	–	8,073	–	–	8,073
Manufacturing engineering	–	–	8,073	–	–	8,073
Maintenance	–	–	8,073	–	–	8,073
Accounting	–	–	8,073	–	–	8,073
Information systems	–	–	4,036	–	–	4,036
Design engineering	–	7,760	4,036	–	–	11,796
	\$512,160	\$7,760	\$139,606	\$22,500	\$20,000	\$702,026

Figure 9.2: Value Stream Costs for ECI

The total value stream cost for the week amounted to \$702,026. During the week in question, the company shipped 2,134 units of product. The average cost of the product is \$328.97.

What is Value Stream Costing Used For?

The results of this simple approach to cost accounting are used to create a value stream P&L and a value stream performance measurement table. The P&L includes

the revenue from sales of the value stream during the period less the materials and conversion costs expended during the same period. [Figure 9.3](#) shows the P&L for the ECI value stream.

Electronic Components, Inc. Controller Products Value Stream

Revenue	\$1,280,400
Material costs	\$512,160
Conversion costs	\$184,380
Value stream profit	\$583,860
ROS	45.60%
Inventory	\$593,008

Figure 9.3: P&L for the ECI Value Stream

This information is shown in the Box Score in [Figure 9.4](#).

	Last week 4-Oct	This week 11-Oct	Planned future state 31-Dec
Units per person	36.16	42.05	51.39
On-time shipment	98.00%	94.00%	98.00%
Dock-to-dock days	23.58	20.50	16.50
First time through	46%	42%	50%
Average product cost	\$388.46	\$348.66	\$316.91
AR days	34.5	37.0	35.0
Productive	9.3%	10.8%	11.9%
Non-productive	63.7%	54.8%	49.3%
Available capacity	27.0%	34.4%	38.8%
Revenue	\$1,101,144	\$1,280,400	\$1,408,440
Material cost	\$462,480	\$512,160	\$535,207
Conversion cost	\$250,435	\$231,884	\$208,696
Value stream gross profit	\$388,288	\$536,356	\$664,537

Figure 9.4: Box Score for ECI

The purpose of the box score is to provide the Value Stream Manager and team with a succinct view of the value stream's performance. The value stream performance measurements are shown in the upper section. A simplified value stream P&L is shown in the lower section, and the current capacity usage is shown in the center section.

The box score is usually reported weekly and shows several weeks of prior history as well as the results for this week. The right-hand column is often used to show the goals the value stream team has set for each of the measurements. These goals do not come from wishful thinking, or by establishing stretch objectives. They come from the plans the team has in place for ongoing lean improvements. The value stream team (or the continuous improvement teams within the value stream) has a specific plan for kaizen events and continuous improvement projects to reach these objectives.

The box score format also is used to document the expected benefits of major lean improvements. This topic has been discussed at some length in [Chapter 4](#). It is discussed in even greater depth in [Chapter 21](#). There is more information about the box score in [Chapter 10](#).

The average cost is sometimes calculated using just the conversion costs, rather than the total cost. This happens when the material costs vary significantly from one product to the next, but the conversion process is more consistent. The average conversion cost for ECI is \$88.97 ($\$189,866/2134$).

Occasionally the average cost is calculated for an attribute of the product rather than for the full product. For example, we have a client that machines hydraulic connectors that are used in the mechanisms contained in commercial aircraft wings and tail assemblies. These connectors help make the wing and tails move up, down, and sideways. They are configured as straight, Y-shaped, and X-shaped, and therefore have 2, 3, or 4 ends. Their manufacture is quite simple. Castings are purchased and then machined to suit the demand of the customer. The mix of products varies considerably from one week to the next. The average cost is reported per end rather than per unit, because this is the primary driver of the product cost.