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The Ineffective Costing System

By

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THE NEW MANUFACTURING ENVIRONMENT

The world is moving toward a global marketplace. Advanced technology, computer integrated manufacturing, just in time (JIT), total quality management, and the automation of manufacturing facilities are redefining the United States' production environment. American manufacturers are no longer satisfied with defect detection but are now striving towards defect prevention. As a result, JIT and other Japanese manufacturing philosophies are rapidly gaining in popularity. A recent study by Coopers & Lybrand indicated that approximately one half of the U.S. manufacturers will have moved to a JIT management style by 1993. This trend is expected to continue.

JIT is an enterprise wide manufacturing approach geared towards the continuous improvement of operations and the elimination of waste. Under the JIT philosophy, waste is considered to be anything that does not add value to a product [Johansson, 1990]. As managers strive to continuously improve their company's performance, their reliance on accurate cost information becomes even more crucial. However, those that rely on the traditional cost accounting system may be basing their decisions on distorted information.

Traditional Cost Accounting System

Under the traditional cost accounting system, direct material and direct labor are debited to the work in process account as they are incurred. Manufacturing overhead costs (indirect labor, indirect materials, taxes, production equipment depreciation,

etc.) for a specific product cannot be determined in the same manner. In addition, many of these indirect costs are unknown until the end of the fiscal year. Therefore, a manufacturing overhead budget is prepared and divided by an estimated cost driver activity (e.g., direct labor hours/dollars, machine hours, ect.). This results in a predetermined overhead rate which is then applied to each product based on that products actual activity. At the end of the period, the discrepancies between the actual and applied overhead is prorated to the work in process, finished goods, and/or cost of goods sold account(s) [Neuner, 1977].

The traditional cost accounting system primarily revolves around a conventional costing theory. This theory makes the following assumptions:

1. If a cost cannot be associated with a tangible object (goodwill is an exception), then that cost must be expensed.
2. Costs which are associated and necessary for a product must be allocated to that product.

Therefore, selling and administrative costs are expensed whereas the cost of plant assets are attached to the product's cost.

Traditional Cost Accounting Problems

The conventional costing theory is not conceptually sound. In todays manufacturing environment, a costing system based on this theory may report inaccurate results. Assumption (2) implies that a cost which is "relevant to the whole must also be relevant to each part." [Sorter & Horngren, 1967]. Since depre-

ciation of plant assets is often based on time, a decrease in the number of units produced will result in a larger amount of overhead allocated to those units. Therefore, managers will be encouraged to maintain production at capacity in order to minimize their per unit costs [Peavey, 1990]. This will cause a build-up of finished goods inventory (and therefore carrying costs) which is counter-productive to a JIT environment.

Another major weakness with the traditional accounting system is that it justifies the capitalizing of costs based on its physical attributes and not on its underlying economic value. By expensing research, marketing, training, and other period costs, the traditional costing approach implies that those expenditures have no future benefit. Taken literally, marketing and research expenditures incurred on the last day of the fiscal year would not benefit the subsequent period. This is clearly not the case. Those that support this theory contend that any method of capitalizing such costs would be entirely arbitrary. However, the expensing of an obvious future benefit (asset) implies that that cost is 0% asset and 100% expense. This immediate write-off of an asset seems to be more arbitrary than, say, capitalizing 30% and expensing 70%. In the latter case, at least some of the cost's economic benefits are recognized [Sorter & Horngren, 1967].

As the manufacturing environment becomes more automated, the traditional classification of direct and indirect costs no longer apply. Direct labor, once considered a significant component, now only accounts for approximately 10% of a product's cost.

Manufacturing overhead now accounts for a significant portion of a product's cost [Peavey, 1990]. Considering the current manufacturing environment, it would seem senseless to allocate a significant portion of a product's cost (manufacturing overhead) based on an insignificant activity such as direct labor hours. Direct labor can no longer be considered a cost driver. A multi-product manufacturer who continues to use direct labor as a basis for allocating overhead will be relying on distorted information.

Due to the increased emphasis on automation, one may assume that the use of a different allocation basis (such as machine hours) will provide accurate information. However, many indirect costs are not a function of any common variable. Instead, many of these costs are unique (or primarily attributable) to a particular product. The traditional cost accounting system pools together these costs and then allocates them to all of the company's products. Consequently, the traditional approach results in its various products being cross subsidized. Low volume specialty products consume more overhead per unit than high volume products. Therefore, the cross subsidizing of these costs frequently results in costs which are overstated for high volume products and understated for low volume products.

The primary function of accounting is to provide useful information. The traditional cost accounting system has not changed in over fifty years [Haedicke and Feil, 1991]. However, the environment that it is suppose to support has changed dramatically. Without an accurate knowledge of a product's cost,

managers will be unable to make the appropriate pricing, marketing, and product mix decisions [Cooper and Kaplan, 1988]. Realizing that the traditional costing system does not accurately support the current manufacturing environment, many companies are beginning to implement other alternatives. Activity based costing (ABC), is one alternative.

Activity Based Costing

The ABC approach, which is based on a relevant costing theory, emphasizes a cost's economic substance rather than its physical form. This theory states that a cost should be attached to a product if, and only if, it provides an economic benefit. In order to be considered an economic benefit, a given cost must favorably affect a company's revenues or costs. Economic benefits should be recognized as such and therefore should be classified as an asset. Those costs which do not have a positive impact on earnings should be expensed. The relevant costing approach is completely consistent with the matching principle [Sorter and Horngren, 1967].

The activity based costing approach (ABC) assigns direct costs to the product as they are incurred. Unlike the traditional method, ABC does not pool together a company's indirect costs and then spread them out across product lines. Rather, it recognizes that different products incur different costs. An ABC approach embodies the concept that resources are consumed by activities and that those activity costs determine a products cost. Under this approach, costs are first evaluated to determine whether or not they add value to a product. The value added

costs are then assigned to a product based on the activity that incurred the cost. The non-value added costs are segregated and targeted for elimination [Johansson, 1990]. This costing approach provides the accurate information needed to support a continuous improvement environment as the following example illustrates:

Comparative Illustration

ABC Company is a highly automated manufacturer that produces three products: Widgets, Gidgets, and Smidgets. The company uses one machine to produce all three of its products. This machine was originally purchased to produce Widgets but can be programmed to produce the other two products. The set up time needed to produce Widgets is immaterial (turn off and then turn it on). However, there is a material amount of time required to set up (reprogram) the machine to produce Gidgets and Smidgets. The company stocked out in 1990. As a result, there was no beginning inventory for 1991.

ABC Company's earnings have been declining and, if continued, may lead to bankruptcy. Management decided to discontinue manufacturing the least profitable product and concentrate its efforts on the other two. This decision will be analyzed under both the traditional and ABC methods. After gaining an understanding of ABC's production process, the following information was obtained:

ABC Company
For The Year Ended December 31, 1991

	Year Total -----
Indirect Overhead	
Deprec. (straight line) ¹	\$50,000
Factory Rent	\$4,000
Supervisory Salary ²	\$20,000
Finished Goods Storage	\$5,000
Setup	\$7,000
Finished Goods Stock Wages	\$5,000

Indirect Overhead	\$91,000
Marketing ³	\$5,000
Interest	\$1,920

	Widgets -----	Gidgets -----	Smidgets -----
Sales Price Per Unit	\$400	\$450	\$475
Raw Materials Per Unit	\$10	\$10	\$10
Direct Labor Per Unit	\$2	\$2	\$2
Other Information			
Set Up Hours For the Year	15	0	5
Sales in Units	155	100	35
Production in Units	250	180	50
Equipment Capacity ¹	250	250	250
Raw Material Orders Placed ²	14	2	4
Percent of Factory Space			
Used for Production ⁴	90%	90%	90%
Machine Hours	2500	10	10

1 The equipment will break down before becoming obsolete. The equipment's original cost was \$250,000, it has a five year life and a total production capacity of 1250 units.

2 Sixty five percent of the supervisor's time is spent ordering materials and the other thirty five percent is spent equally among the three products.

3 Market research indicates that every dollar spent on marketing results in \$.50 of sales in the current year and \$.25 of sales in the following year.

4 The remaining ten percent is used to store raw materials and work in process inventories.

Based on the above information the following product costs were calculated:

Traditional Costing Approach				
	Expense	Widgets	Gidgets	Smidgets
Raw Materials		\$1,800	\$500	\$200
Direct Labor		\$360	\$100	\$40
Indirect Overhead (\$91,000/2,500 Mach. Hrs.)		\$65,520	\$18,200	\$7,280
Marketing	\$5,000			
Interest	\$1,920			
Total Cost	\$6,920	\$67,680	\$18,800	\$7,520
Unit Cost	=====	=====\$376	=====\$376	=====\$376

Activity Based Costing Approach				
	Expense	Widgets	Gidgets	Smidgets
Raw Material		\$1,800	\$500	\$200
Direct Labor		\$360	\$100	\$40
Depreciation ¹		\$36,000	\$10,000	\$4,000
Rent ²	\$400	\$2,592	\$720	\$288
Supervisor Salary ³				
Order Costs		\$1,857	\$3,714	\$7,429
General		\$2,333	\$2,333	\$2,334
Finished Goods Storage ²	\$5,000			
Set Up Cost ⁴		\$0	\$2,333	\$4,667
Stock Wages ²	\$5,000			
Interest	\$1,920			
Marketing	\$1,250	\$1,731	\$541	\$228
Total Cost	\$13,570	\$46,673	\$20,241	\$19,186
Unit Cost	=====	=====\$259	=====\$405	=====\$959

1 Depreciation allocated per unit = \$250,000/1,250

2 Rent allocation = \$3,600 multiplied by the product's percent of the machine hours

3 Order cost allocation = \$13,000 multiplied by the products percent of the number of orders placed.
General supervisory cost is allocated equally.

4 Set up cost allocation = \$7,000 multiplied by the products percent of the total set up time.

5 Marketing cost allocation = \$2,500 multiplied by the products percent of the total sales dollars.

The costs which were expensed under the activity based approach do add value to the product. In fact, storing inventory could damage the product (ie., get bruised, nicked, or scratched) which would actually decrease the value of the product. Seventy five percent of the marketing cost adds value to the product (\$2,500 benefits this year and \$1,250 may benefit next year). The remaining twenty five percent does not add value to the product and therefore is expensed. The \$1,250 that may benefit the following year is deferred. If ABC Company does not have any sales in 1992, then the deferred amount should be expensed. The following compares the two costing methods:

Traditional Costing Approach				
	Widgets	Gidgets	Smidgets	Total
Sales	\$40,000	\$15,750	\$9,500	\$65,250
Cost of Goods Sold	(\$37,600)	(\$13,160)	(\$7,520)	(\$58,280)
Gross Margin	\$2,400	\$2,590	\$1,980	\$6,970
Period Costs				(\$6,920)
Net Operating Income				\$50
Gross Margin (%)	6%	16%	21%	11%

Activity Based Costing Approach				
	Widgets	Gidgets	Smidgets	Total
Sales	\$40,000	\$15,750	\$9,500	\$65,250
Cost of Goods Sold	(\$25,930)	(\$14,169)	(\$19,186)	(\$59,285)
Gross Margin	\$14,070	\$1,581	(\$9,686)	\$5,965
Non Value Added Costs				(\$13,570)
Net Operating Income				(\$7,605)
Gross Margin (%)	35%	10%	(102%)	9%

If management was to base its decision on the information provided by the traditional costing approach, it would discontinue the production of Widgets and concentrate its production efforts on the specialty products. Since there most likely is a larger demand for Smidgets (no ending inventory), this would seem to be an ideal strategy. However, this strategy would further increase overhead costs and cause ABC's earnings to crash. Management would have been basing its financial decisions on distorted information.

Choosing the correct product to discontinue would be painfully obvious under the activity based approach. It is understandable why there is such a demand for Smidgets. ABC Company had been selling them for only fifty percent of their actual cost. ABC Company should discontinue the production of Smidgets and concentrate its efforts on Widgets.

Conclusion

New manufacturing techniques have improved the quality and competitiveness of many U.S. manufacturers. Those that continue to rely on the traditional cost accounting system may be basing their decisions on distorted information. An ABC system provides more accurate information about a company's support and production activities. Furthermore, this costing approach provides the needed information to support a continuous improvement manufacturing environment. As more companies become aware of its strategic implications, ABC will undoubtedly set the standard for cost accounting in the future.

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