

1. What business decisions at Seligram does the cost system support? In this context, what caused the existing cost system at Seligram (ETO) to fail?

In general, a cost system supports the pricing decisions of the firm. ETO's existing cost system contains only one cost center (the entire facility). All overhead is collected into a single cost pool, and the total overhead cost is divided by the total number of direct labor dollars consumed to give a single direct labor dollar burden rate. The major flaw in ETO's existing system is that it assumes that all products consume direct labor and overhead in the same proportion. However, some products are produced on simple labor intensive equipment while others require very expensive automated equipment. Therefore, it is extremely unlikely that all products consume direct labor and overhead in the same proportion. As testing processes become more complicated, they require more expensive equipment and less labor-intensive equipment, which means that the proportion of costs due to overhead is increasing while the proportion of costs due to direct labor is decreasing. This caused the existing cost system to fail.

2. Calculate the reported costs of the five components described in Exhibit 6 under the three systems.

2a. *Costs Under The Existing System: One Center System*

Product	Direct Labor \$	Overhead @ 145%	Total
ICA	917	1330	2247
ICB	2051	2974	5025
Capacitor	1094	1586	2680
Amplifier	525	761	1286
Diode	519	753	1272

2b. *Costs Under The Proposed System from the Accounting Manager: Two Center System*

Product	Direct Labor \$	Overhead \$	Overhead (Machine Hrs.)	Overhead (Direct Labor \$)	Total
ICA	917	1480	(18.5)	183	2580
ICB	2051	3200	(40.0)	410	5661
Capacitor	1094	600	(7.5)	219	1913
Amplifier	525	400	(5.0)	105	1030
Diode	519	960	(12.0)	104	1583

2c. Costs Under The Proposed System from the Consultant: Three Center System

Product	Direct Labor \$	Overhead (M/C Hours) \$	Main (M/C Hours) (Hours)	Overhead (M/C Hours) \$	Mech (M/C Hours) Hours	Overhead (DL\$)	Total
ICA	917	535	8.5	1130	10.0	183	2765
ICB	2051	882	14.0	2938	26.0	410	6281
Capacitor	1094	184	3.0	509	4.5	219	2011
Amplifier	525	252	4.0	113	1.0	105	995
Diode	519	441	7.0	565	5.0	104	1629

3. Explain conceptually (and briefly) the dynamics that cause the movements you see in the costs calculated above. For example, why do costs for certain components increase when moving from alternative (a) to (b) but decrease from (b) to (c), while other costs increase from (a) to (b) to (c)?

First, let's compare (a) to (b). ICA, ICB, and the diode all consume a relatively large number of machine hours per direct labor dollar compared to the capacitor and the amplifier (ratio of direct labor dollars per machine hour for the five products are 50, 51, 146, 105, and 43, respectively). Thus, switching to machine hours in the test room causes more costs to be allocated to these products. Their reported costs therefore go up. The reported costs of the other two products in contrast decrease, since they consume a relatively low number of direct labor dollars per machine hour.

Now let's compare (a) and (b) to (c). For system 2(c), the mechanical burden rate is \$113 per machine hour compared to \$64 for the main test room. Therefore, components that consume relatively more mechanical machine hours compared to main machine hours will have higher reported product costs. These are the ICA, ICB, capacitor, and the diode. For some products, the results under system 2(b) and 2(c) reinforce each other, whereas for other, they counteract. For example, the reported cost of ICB goes up 13% with the introduction of the cost center for 2(b) and up an additional 10% with the introduction of the cost center for 2(c). In contrast, the reported cost of the amplifier goes down with the introduction of the center 2(b) and up with the introduction of the center 2(c).

4. Which of the three cost systems do you think is most appropriate? Why? What are some potential disadvantages of the system that you recommend?

The three-center system is the most appropriate cost system because it provides the most accurate cost information. The increased number of cost centers under the three-center system enables the cost system to capture differences in the way overhead is consumed in different parts of the production process.

The potential disadvantage of the system is that the cost of system redesign may be high. The selection of an optimal cost system is based on trade-offs between increased accuracy and the cost of system redesign.

5. Would you treat the new machine as a separate cost center or as part of the main room? Why? If you were to treat it separately, how would you allocate its costs?

We can use the data provided in Exhibit 5 of the case to determine the burden rate of the machine. The burden rate for the first year will be much higher than for the Nth year because of start-up costs and depreciation.

Burden rate for new machine

	Burden	Variable	Depreciation	Other	Total
1 st year	Machine cost	\$100,000	\$500,000	\$225,000	\$825,000
	Machine hours	400 hours			
	Burden rate/machine hour	<u>\$250</u>	<u>\$1,250</u>	<u>\$562.50</u>	<u>\$2,062.50</u>
N th year	Machine cost	\$100,000	\$120,000*	\$150,000	\$370,000
	Machine hours	2,400 hours			
	Burden rate/machine hour	<u>\$41.67</u>	<u>\$50</u>	<u>\$62.50</u>	<u>\$154.17</u>

*Approximate depreciation charge for year 6.

If the new machine is not treated as a separate cost center, then the new burden rates for the main test become:

Main test room burden rates with machine included

	Variable	Depreciation	Other	Total
1 st year				
Existing costs	\$887,379	\$88,779	\$1,126,958	\$2,103,116
Machine costs	<u>\$100,000</u>	<u>\$500,000</u>	<u>\$225,000</u>	<u>\$825,000</u>
Total costs	987,379	\$588,779	\$1,351,958	\$2,928,116
Machine hours	33,000+400			
Burden rate/machine hour	<u>\$29.56</u>	<u>\$17.63</u>	<u>\$40.48</u>	<u>\$87.67</u>
N th year				
Existing costs	\$887,379	\$88,779	\$1,126,958	\$2,103,116
Machine costs	<u>\$100,000</u>	<u>\$125,000</u>	<u>\$150,000</u>	<u>\$375,000</u>
Total costs	\$987,379	\$203,779	\$1,276,958	\$2,478,116
Machine hours	33,000+2,400			
Burden rate/machine hour	<u>\$27.89</u>	<u>\$8.49</u>	<u>\$36.07</u>	<u>\$70.03</u>

As can be seen, failing to treat the new machine as a separate cost center seriously distorts the burden rates.