

Hilton Chapter14 Adobe Connect

CHAPTER 14: DECISION MAKING, RELEVANT COSTS & BENEFITS

Chapter 14 concerns decision making. In one sense, the entire book leads to this chapter.

THE DECISION-MAKING PROCESS

The decision process consists of the six steps that follow.

1. Clarify the decision problem.
2. Specify the criterion upon which the decision will be made.
3. Identify the alternatives.
4. Develop a decision model that brings together the criterion, the constraints, and the alternatives.
5. Collect the data.

(Note: accounting, production, and engineering departments will almost certainly provide the data for the decision.)

6. Select an alternative

(Note: another department manager may make the recommendation regarding the preferred alternative. The manager must be sufficiently knowledgeable to critique the recommended decision.)

RELEVANT INFORMATION

The information gathered should be relevant to the opportunity or problem at hand.

Relevant information involves costs and benefits that

1. *Differ among the alternatives being considered*
2. *Are future oriented.*

Both guidelines must be met.

This concept is an important, key takeaway. The costs relevant for decision making are those that are future costs (and benefits) and that differ between (or among) alternatives.

Sunk costs are past costs that have already been incurred.

- *Such costs are irrelevant in decision making* because the amounts cannot be changed by any of the alternatives under review.

A **differential cost** is the net difference in cost between two alternatives.

An **opportunity cost** is the cost of a forgone alternative.

- Companies must frequently pass up profitable (beneficial) projects. The profit (benefit) forgone becomes an opportunity cost to the firm, and such costs are relevant in the decision-making

SPECIAL DECISION SITUATIONS

Note: The *decisions in this chapter* are *primarily short-term in nature*.

The text covers four common decision making situations that confront managers.

1. Accept a Special Order
2. Make or Buy
3. Add or Drop a Product, Service, or Department
4. Joint Products: Sell or Process Further

SPECIAL ORDERS

In this situation, a manager considers an order (often a one-time order) at a special price. Key issues to evaluate include:

Cost behavior: *Unless told otherwise, students should assume that total fixed costs remain fixed and only total variable costs change.*

Qualitative considerations: These include, among other things,

- The reaction of present customers should they hear about the special price,
- An organization's available capacity (*a key decision variable*)
- Regulations that guard against price discrimination.

Organization with Sufficient Capacity

- Opportunity costs not an issue
- Assume that unused capacity exists to meet the special order unless otherwise indicated
- Generally, only the variable costs with producing the special order

Organization at Capacity

- *The opportunity cost of the lost contribution margin from regular, higher-priced sales must be factored into the decision.*

Special Order Problem

S'Round Sound, Inc. (SRS) reported the following results from the sale of 24,000 units of IT-54:

Sales	\$528,000
Variable manufacturing costs	288,000
Fixed manufacturing costs	120,000
Variable selling costs	52,800
Fixed administrative costs	35,200

Rhythm Company has offered to purchase 3,000 IT-54s at \$16 each. Sound has available capacity, and the president is in favor of accepting the order. She feels it would be profitable because no variable selling costs will be incurred. The plant manager is opposed because the "full cost" of production is \$17 ($\$408,000 / 24,000 = 17$).

Ignoring qualitative consideration, if the special order is accepted, how much will SRS's net income change?

Recast as contribution margin

	Current	Sp. Ord	New Income
Sales	\$528,000	(2)48,000	
Variable manufacturing costs	(1) 288,000	36,000	
Variable selling costs	52,800	0	
Contribution margin	187,200	12,000	
	35.45%		
Fixed manufacturing costs	120,000		
Fixed administrative costs	35,200		
Net income	32,000	12,000	44,000

(1) $\$288,000 / 24,000 \text{ units} = \12 per unit

(2) $3,000 @ \$16 = \$48,000$

(3) $3,000 \times \$12 = 36,000$

MAKE OR BUY (PRODUCE IN-HOUSE OR OUTSOURCE)

This situation requires careful consideration of fixed costs.

The total cost per unit of a product or service includes a unitized portion of fixed cost, a cost that may continue even if the item or service is purchased elsewhere at a lower price.

Example. Attached is a management report. Is the management report correct? If not, please prepare your own financial analysis and make a recommendation based only on the financial information.

Casting Technology Resources (CTR) has purchased 10,000 pumps annually from Kobec, Inc. Because the price keeps increasing and reached \$68.00 per unit last year, CTR’s management has asked for an estimate of the cost of manufacturing the pump in CTR’s facilities. CTR makes stampings and castings and has little experience with products requiring assembly.

The engineering, manufacturing, and accounting departments have prepared a report for management that includes the following estimate for an assembly run of 10,000 pumps. Additional production employees would be hired to manufacture the pumps but no additional equipment, space, or supervision would be needed.

The report states that total costs for 10,000 units are estimated at \$957,000, or \$95.70 per unit. The current purchase price is \$68.00 per unit, so the report recommends continued purchase of the product.

Components (outside purchases)	\$120,000
Assembly labor*	300,000
Manufacturing overhead†	450,000
General and administrative overhead‡	87,000
Total costs	<u>\$957,000</u>

*Assembly labor consists of hourly production workers.
†Manufacturing overhead is applied to products on a direct-labor-dollar basis. Variable-overhead costs vary closely with direct-labor dollars.

Fixed overhead	50% of direct-labor dollars
Variable overhead	<u>100%</u> of direct-labor dollars
Manufacturing-overhead rate	<u>150%</u> of direct-labor dollars

‡General and administrative overhead is applied at 10 percent of the total cost of material (or components), assembly labor, and manufacturing overhead.

Required: Was the analysis prepared by Casting Technology Resources’ engineering, manufacturing, and accounting departments and their recommendation to continue purchasing the pumps correct? Explain your answer and include any supporting calculations you consider necessary.

INSOURCE VS OUTSOURCE

The analysis prepared by the engineering, manufacturing, and accounting departments of CTR was not correct. However, their recommendation was correct, provided that potential labor-cost improvements are ignored. An incremental cost analysis similar to the following table should have been prepared to determine whether the pump should be purchased or manufactured. In the following analysis, fixed factory overhead costs and general and administrative overhead costs have not been included because they are not relevant; these costs would not increase, because no additional equipment, space, or supervision would be required if the pumps were manufactured. Therefore, if potential labor cost improvements are ignored, CTR should purchase the pumps because the purchase price of \$68.00 is less than the \$72.00 relevant cost to manufacture.

Incremental cost analysis:

	Cost of 10,000 Unit Assembly Run	Per Unit
Purchased components	\$120,000	\$12.00
Assembly labor	300,000	30.00
Variable manufacturing overhead	<u>300,000</u>	<u>30.00</u>
Total relevant cost.....	<u>\$720,000</u>	<u>\$72.00</u>

ADD OR DROP A SERVICE, PRODUCT, OR DEPARTMENT

The key is the proper handling of fixed costs and determination if such amounts are **avoidable** or **unavoidable**.

The manager should isolate costs that will disappear with that line.

In many cases, fixed costs are not avoidable, particularly allocated common costs.

The contribution margin lost from the activity to be dropped must also be considered.

Attached is E14-31.

Day Street Deli's owner is disturbed by the poor profit performance of his ice cream counter. He has prepared the following profit analysis for the year just ended.

Sales		\$67,500
Less: Cost of food		<u>30,000</u>
Gross profit		\$37,500
Less: Operating expenses:		
Wages of counter personnel	\$18,000	
Paper products (e.g., napkins)	6,000	
Utilities (allocated)	4,350	
Depreciation of counter equipment and furnishings	3,750	
Depreciation of building (allocated)	6,000	
Deli manager's salary (allocated)	<u>4,500</u>	
Total		<u>42,600</u>
Loss on ice cream counter		<u><u>\$ (5,100)</u></u>

Exercise 14-31

Drop Product Line

(LO 14-4, 14-5)



Required: Criticize and correct the owner's analysis.

EXERCISE 14-31

The owner's analysis includes the following allocated costs that will be incurred regardless of whether the ice cream counter is operated:

Utilities	\$ 4,350
Depreciation of building	6,000
Deli manager's salary	<u>4,500</u>
Total	<u>\$14,850</u>

It is possible that closing the ice cream counter might save a portion of the utility cost, but that is doubtful.

Revised Analysis:

Sales		\$67,500
Less: Cost of food		<u>30,000</u>
Gross profit		37,500
Less: Operating expenses		
Wages of counter personnel	\$18,000	
	0	
Paper products	6,000	
Depreciation of counter equipment and furnishings*		
	<u>3,750</u>	
Total		<u>27,750</u>
Profit on ice cream counter		<u>\$ 9,750</u>

*Depreciation on the counter equipment and furnishings is included because it is traceable to the ice cream operation and is an expense in the determination of income. If a cash-flow analysis is desired, this noncash expense should be excluded.

JOINT PRODUCTS: SELL OR PROCESS FURTHER

A **joint production process** results in the commingled manufacture of two or more products, called joint products.

The products become identifiable from each other at the **split-off point**.

Management must frequently decide whether to sell the products at split-off or, alternatively, incur additional cost beyond split-off (called **separable cost**) and then sell the goods for a higher price.

Joint costs incurred prior to split-off are not relevant when making the sell-at-split-off or-process-further decision, because these costs will be incurred regardless of the alternative selected.

Compare the separable cost incurred to process further against the amount of increased sales revenue.

OTHER FACTORS IN DECISION MAKING

Allocation Of Limited Resources

Decisions may involve the use of limited labor hours, limited materials, and limited machine time.

When only one limited resource is present, **a company should focus on products that have the greatest amount of contribution margin per unit of the scarce resource.**

A tool called the *theory of constraints* may be useful for identifying limiting constraints and seeking ways to relax them.

Theory of Constraints. A management approach that focuses on identifying the constraints that limit an organization's ability to reach a higher level of goal attainment and to relax that constraint to allow higher activity.

Example. Excess Capacity.

1. If Carpenter's Mate has excess machine capacity and can add more labor as needed (i.e., neither machine nor labor is a constraint), and the excess capacity can be used for a single product line, the excess production capacity should be allocated to producing which product?
2. If Carpenter's Mate has excess machine capacity but a limited amount of labor time, the production capacity should be allocated to producing which product or products.

Carpenter’s Mate, Inc. manufactures electric carpentry tools. The Production Department has met all production requirements for the current month and has an opportunity to produce additional units of product with its excess capacity. Unit selling prices and unit costs for three different drill models are as follows:

	Home Model	Deluxe Model	Pro Model
Selling price	\$58	\$65	\$80
Direct material	16	20	19
Direct labor (\$10 per hour)	10	15	20
Variable overhead	8	12	16
Fixed overhead	16	5	15

Variable overhead is applied on the basis of direct-labor dollars, while fixed overhead is applied on the basis of machine hours. There is sufficient demand for the additional production of any model in the product line.

Required:

1. If Carpenter’s Mate, Inc. decides to produce 100 additional units of the Home Model, 100 additional units of the Deluxe Model, and 100 additional units of the Pro Model, what is the incremental contribution margin?

1. When there is no limit on production capacity the Pro model should be manufactured since it has the *highest contribution margin per unit*.

	Home Model	Deluxe Model	Pro Model
Selling price	<u>\$58</u>	<u>\$65</u>	<u>\$80</u>
Direct material	16	20	19
Direct labor	10	15	20
Variable overhead	<u>8</u>	<u>12</u>	<u>16</u>
Total variable cost	<u>\$34</u>	<u>\$47</u>	<u>\$55</u>
Contribution margin	<u>\$24</u>	<u>\$18</u>	<u>\$25</u>

2. When labor is in short supply manufacturing should be allocated first to the Home Model because it has the *highest contribution margin per direct-labor hour*. Then the Pro Model should be considered, and finally the Delux Model.

	Home Model	Deluxe Model	Pro Model
Contribution margin per unit	\$24	\$18	\$25
Direct-labor hours required	1.0	1.5	2.0
Contribution margin per direct-labor hour	\$24	\$12	\$12.50

Uncertainty

Analysts can incorporate uncertainty into the decision process by weighting an alternative with its probability of occurrence.

Expected Value. Multiplying the alternative by a probability and then summing the results will yield the **expected value**, an average that is used to make the decision.

Many businesses use **sensitivity analysis** to determine what would happen in a decision analysis if a key variable or assumption proved to be incorrect.

OTHER ISSUES IN DECISION MAKING

Several helpful hints in decision making:

Pitfalls to Avoid

- **Ignore sunk costs.**
- **Beware of unitized fixed costs, i.e., the average fixed cost per unit, although fixed costs do not change in total.**
- **Beware of allocated fixed costs; identify the avoidable costs.**
- **Pay special attention to identifying and including opportunity costs in the analysis of alternatives.**