Unit 24
Decision Making Process: Special Cases

ILO1. Special Order Decisions
ILO2. Constrained Resource Decisions
ILO3. Joint Product Costs and Sell or Process Further Decisions

ILO1. Special Order Decisions

When dealing with special orders a few points need to be addressed. First is the nature of the order, in other words, a special order is outside of a company regular activities or production. Secondly, when analyzing such an order the only costs that are relevant are incremental, and the only benefits that are relevant are likewise incremental.

To being our analysis of this process we use data from our company Jet Inc. to illustrate their response to a special order. We consider primarily, whether they should accept or not.

Jet Inc.
Contribution Inc. Stmt, before considering special order

Revenue (5,000 × $20)		$ 100,000
Variable costs:		
Direct materials	$ 20,000	
Direct labor	5,000	
Manufacturing overhead	10,000	
Marketing costs	5,000	
Total variable costs		40,000
Contribution margin		60,000
Fixed costs:		
Manufacturing overhead	$ 28,000	
Marketing costs	20,000	
Total fixed costs		48,000
Net operating income		$ 12,000

Fig 24.1 Contribution Statement

By using this income statement we see the normal sales for Jet's totals 5,000 units. If Jet's agrees to the special order, the incremental revenue of $30,000 will be greater than the incremental costs of $24,000. This indicates that Jet's should accept the offer as they stand to gain $6,000 from the negotiation.

Incremental revenue (3,000 × $10)	$30,000
Incremental cost (3,000 × $8 variable cost)	24,000
Financial advantage of accepting the order	$ 6,000

Fig 24.2 Jet Inc. Special Order Gain

ILO2. Constrained Resource Decisions

To begin the discussion of resource scarcity and volume tradeoff, we assume the perspective of manufacturers who do not have enough capacity to produce all the products and sales demanded by their customers. In these cases companies must trade off, or sacrifice production in favour of others, but always to meet the end goal of profit maximization. With

a limited resource that inhibits a company's ability to meet customer demands, the machine, or process that internalizes the limitation is the constraint. We can disregard fixed costs, therefore the product mix that maximizes the company's total contribution margin should be chosen. In light of the aforementioned constraint, a company should select the products that provide the highest contribution margin, and not those that have the highest unit contribution margins. We will use Ensign company to illustrate this.

	Product 1	Product 2
Selling price per unit	$ 60	$ 50
Less variable expenses per unit	36	35
Contribution margin per unit	$ 24	$ 15
Current demand per week (units)	2,000	2,200
Contribution margin ratio	40%	30%
Processing time required on machine A1 per unit	1.00 min.	0.50 min.

Fig 24.3 Ensign Company Example

If we follow the example in the table above, we are required to determine the best option for Ensign; production of Product 1, or 2. We must include the following;

- Machine A1 is the constraint
- All of machines have excess capacity and therefore not eligible
- Machine A1 has a capacity of 2,400 production minutes each week

As we have suggested, Ensign should choose the product that generates the higher contribution margin, in our example that's product 2 as it compares $30 to product 1 whose contribution margin is only $24. The best position for Ensign would be to maximize the contribution margin of product 2 to meet customer demand, and use remaining capacity to manufacture product 1. If we follow this path, we can see the following calculations.

- 2,200 units of product 2, would require 1,100 minutes of machine A1 capacity
- The remaining 1,300 minutes could be used for the production of product 1, resulting in 1,300 units
- The resulting combined production would be 2,200 units of product 2, and 1,300 units of product 1, for a total contribution margin of $64,200

Alloting Our Constrained Resource (Machine A1)

Weekly demand for Product 2		2,200	units
Time required per unit	×	0.50	min.
Total time required to make Product 2		1,100	min.
Total time available		2,400	min.
Time used to make Product 2		1,100	min.
Time available for Product 1		1,300	min.
Time required per unit	÷	1.00	min.
Production of Product 1		1,300	units

Fig 24.4 Allotting the Constrained Resource

	Product 1	Product 2
Production and sales (units)	1,300	2,200
Contribution margin per unit	$ 24	$ 15
Total contribution margin	$ 31,200	$ 33,000

Fig 24.5 Contribution Margin

Additional consideration for managers would be to determine the value of obtaining more of the constrained resource, specifically, how much should Ensign pay for additional production minutes of machine A1.

As we have seen, each additional minute would be used to manufacture product 1, therefore, Ensign should pay up to $24 per minute which is the contribution margin per minute.

To help managers take advantage of this contribution margin, there are a number of options they could employ to relax or alleviate the constraint.

- Work overtime
- Subcontract the excess production
- Purchase more machines
- Allocate more workers to the constraint
- Focus business process improvements on the constraint
- Reduce the number of defective units through the constraint

ILO3. Joint Product Costs and Sell or Process Further Decisions

This area of decision making relates to the number of end products that can be produced from a single raw material input. This is often referred to as joint products, and the split off point in the creation process is when the joint products can be recognized individually. For example, crude oil can be used to manufacture gasoline, organic chemicals, jet fuel, asphalt and others.

With joint products, we must also have joint costs. This describes the costs incurred up to the split off point. These represents common costs that are incurred simultaneously to produce a number of outputs. Typically, these costs are allocated according to the relative sales value of the output. While this system favours record keeping and balance sheet inventory valuations, it is also a risky approach for decision making.

For decisions relating to sell or process further, joint costs are irrelevant and should not be allocated to outputs for decision making purposes. It is profitable to further the processing of a joint product as long as the incremental revenue from such processing exceeds the incremental processing costs after the split off. We provide the following sawmill illustration.

	Per Log	
	Lumber	Sawdust
Sales value at the split-off point	$ 140	$ 40
Sales value after further processing	270	50
Allocated joint product costs	176	24
Cost of further processing	50	20

Fig 24.6 Data about Sawmill

Using the data below we can see the joint products; lumber and sawdust. The incremental revenue from processing them further is $130 for lumber, and $10 for sawdust. The financial resulting financial position (advantage or disadvantage) of processing amounts to a positive $80 for lumber, but negative $10 for sawdust. Meaning, lumber should be processed, but sawdust should be sold at the split off point.

Analysis of Sell or Process Further		
	Per Log	
	Lumber	Sawdust
Final sales value after further processing	$ 270	$ 50
Sales value at the split-off point	140	40
Incremental revenue from further processing	130	10
Cost of further processing	50	20
Financial advantage (disadvantage) of further processing	$ 80	$ (10)

Fig 24.7 Analysis for Sell or Process Decision

The final consideration is activity based costing and relevant costs. This is helpful as it identifies relevant costs associated with decision making purposes. However managers should proceed with caution and decide which potentially relevant costs are actually avoidable.

References:

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