Chapter 8.
Price Analytics

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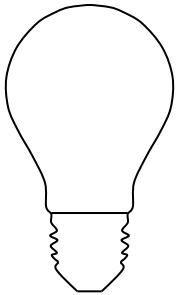
• Some material adapted from: Sorger, Stephan. “Marketing Analytics: Strategic Models and Metrics. Admiral Press. 2013.

Outline/ Learning Objectives

Topic	Description
Techniques	Identify different pricing techniques and when to apply them
Assessment	Check profit impact of different prices
B2B & B2C	Explain pricing models for consumer and business markets
Discrimination	Define price discrimination and its effect on profitability

Pricing Techniques

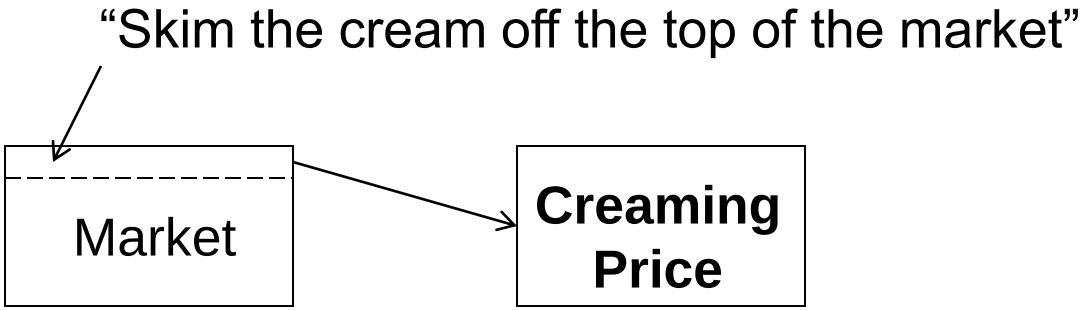


Acme Light Bulb Company

LED	Halogen	CFL
Premium Product	Midline Product	Economy Product
Unique in market	Other Competitors	Many Competitors
Sell to specialty markets	Sell to Kitchen & Bath	Sell to Warehouse Stores

Acme Light Bulb Company; Used for Ongoing Example

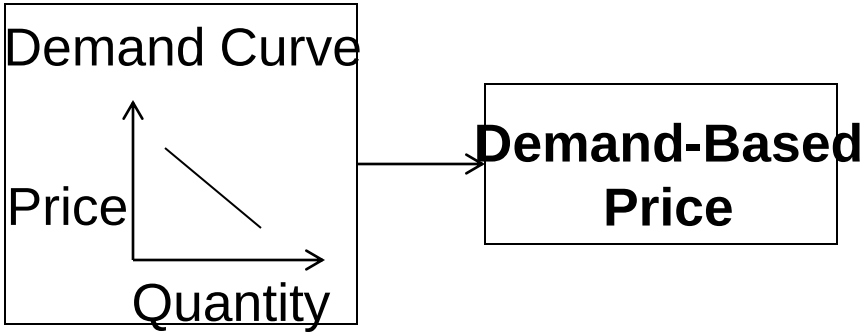
Pricing Techniques: Creaming/ Skimming



Description: Set prices high during new product/service introduction
Example: Panasonic set high prices for its new 3D TVs during launch

Sample Calculations for Acme Example:
Acme can use creaming/ skimming for its Acme LUX premium LED light bulb
Charge $30 for Acme LUX light bulb, even though incandescent available for $1

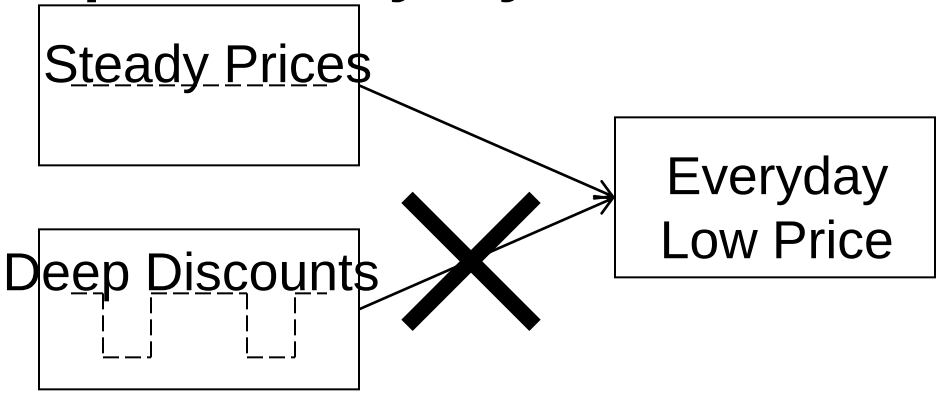
Pricing Techniques: Demand-Based



Description: Set prices to maximize profit, based on consumer demand
Example: Amazon.com adjusts prices over time to maximize profitability

Sample Calculations for Acme Example:
Acme carefully monitors the quantity of products it sells at different prices
Acme has developed a demand curve, which it uses to maximize profits

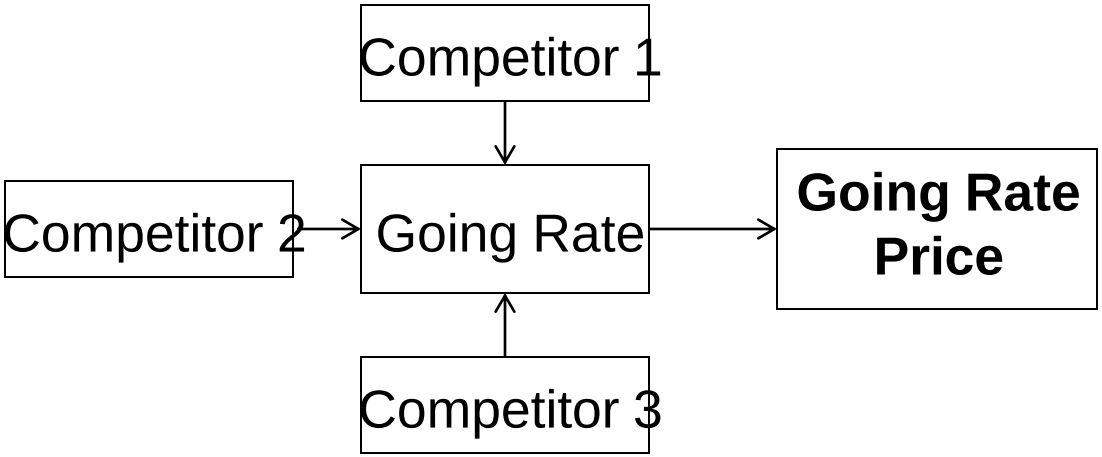
Pricing Techniques: Everyday Low Price



Description: Set prices consistently low to attract price-sensitive customers
Example: Walmart uses everyday low pricing to emphasize good value

Sample Calculations for Acme Example:
Acme charges everyday low prices for its midline halogen light bulbs
-Avoids attracting new competitors into replacement light bulb industry
-Reduces spikes in demand for light bulbs from price promotions

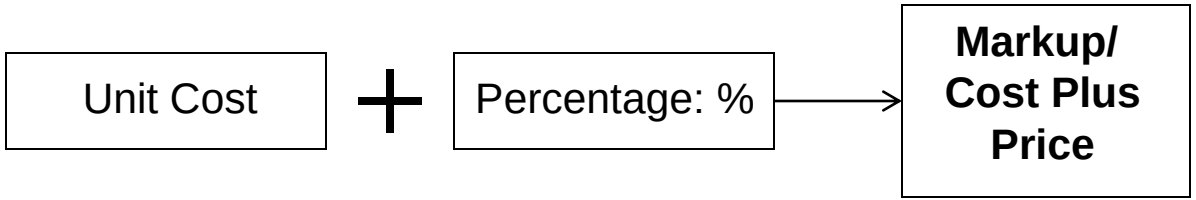
Pricing Techniques: Going Rate



Description: Set prices to align with those of competitors
Example: Gasoline stations in same area often sell gas at similar prices

Sample Calculations for Acme Example:
Acme sells compact fluorescent lamps (CFLs) to home improvement retailers
Retailers can choose from many suppliers to purchase CFLs
Price set by “going rate” with those suppliers

Pricing Techniques: Markup/ Cost Plus

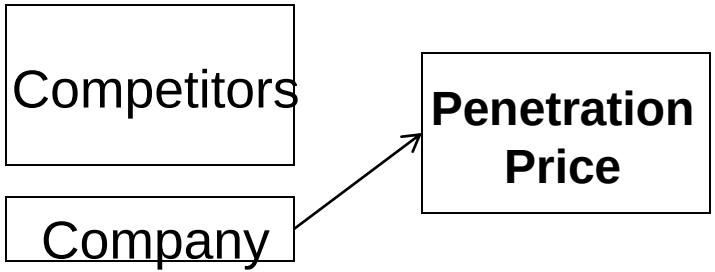


Description: Set prices by adding percentage to unit cost
Example: Attorneys, contractors, and consumer packaged goods often use markup

Unit Cost = (Variable Cost) + (Fixed Cost) / (Unit Sales)
Variable Cost = Cost of labor & materials to manufacture each unit
Fixed costs = Costs that remain fixed as we increase the number of units manufactured
Unit Sales = Quantity of units that we sell
Markup Price = (Unit Cost) / (1 – Markup Percentage)

Sample Calculations for Acme Example:
Variable cost = $10 per bulb; Fixed costs = $400,000; Unit sales estimate = 40,000
Markup percentage = 20%
Unit cost = ($10) + ($400,000) / (40,000) = $10 + $10 = $20 per bulb
Markup Price = ($20) / (1 – 0.20) = $25 per light bulb

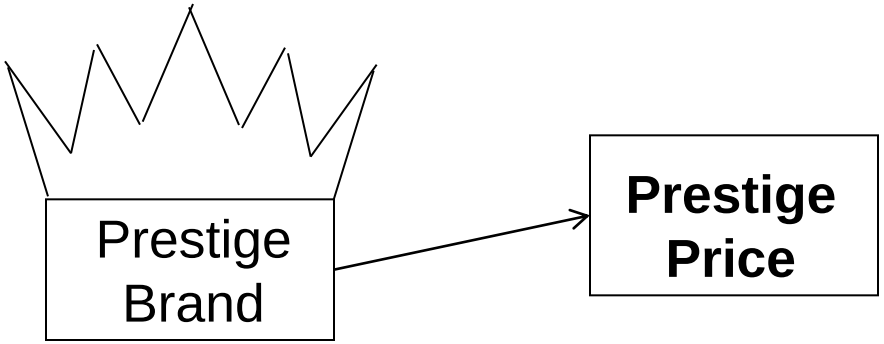
Pricing Techniques: Penetration



Description: Set prices low to attract new customers and expand market share
Example: P&G and Unilever use penetration pricing to expand into new areas

Sample Calculations for Acme Example:
$252 million market in CFLs in 2010
Acme could cut its price for its CFLs to penetration levels to gain market share

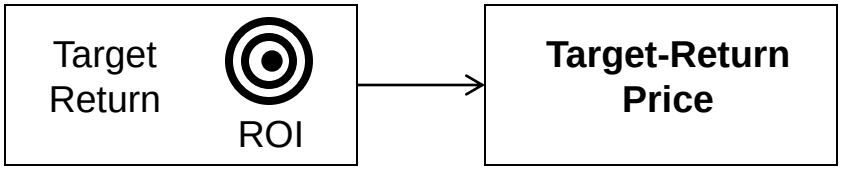
Pricing Techniques: Prestige Pricing



Description: Set prices high to signal high quality or status
Example: Rolex sets prices very high to align with its luxury brand

Sample Calculations for Acme Example:
Acme could apply prestige pricing to its Acme LUX LED light bulbs
Differentiated through its high illumination levels and natural spectrum lighting

Pricing Techniques: Target-Return Pricing

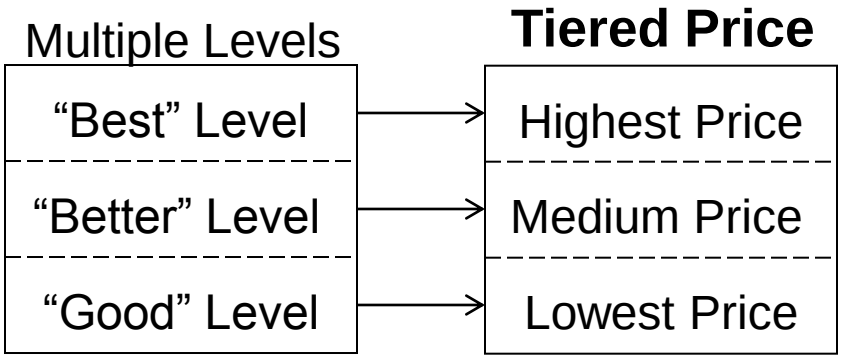


Description: Set prices to achieve company-defined return on investment
Example: Industrial supply companies often use target-return pricing

Unit Cost = (Variable Cost) + (Fixed Cost) / (Unit Sales)
Variable Cost = Cost of labor & materials to manufacture each unit
Fixed costs = Costs that remain fixed as we increase the number of units manufactured
Unit Sales = Quantity of units that we sell
Target-Return Price = (Unit Cost) + (Target ROI) * (Investment) / (Unit Sales)

Sample Calculations for Acme Example:
Variable cost = $10 per bulb; Fixed costs = $400,000; Unit sales estimate = 40,000
Investment = $800,000; Target ROI = 20%
Unit cost = ($10) + ($400,000) / (40,000) = $10 + $10 = $20 per bulb
Target-Return Price = ($20) + (20%) * ($800,000) / ($40,000) = $24

Pricing Techniques: Tiered



Description: Set prices at different price points for different levels of features
Example: Big O Tires offers Good, Better, and Best oil change packages

Sample Calculations for Acme Example:

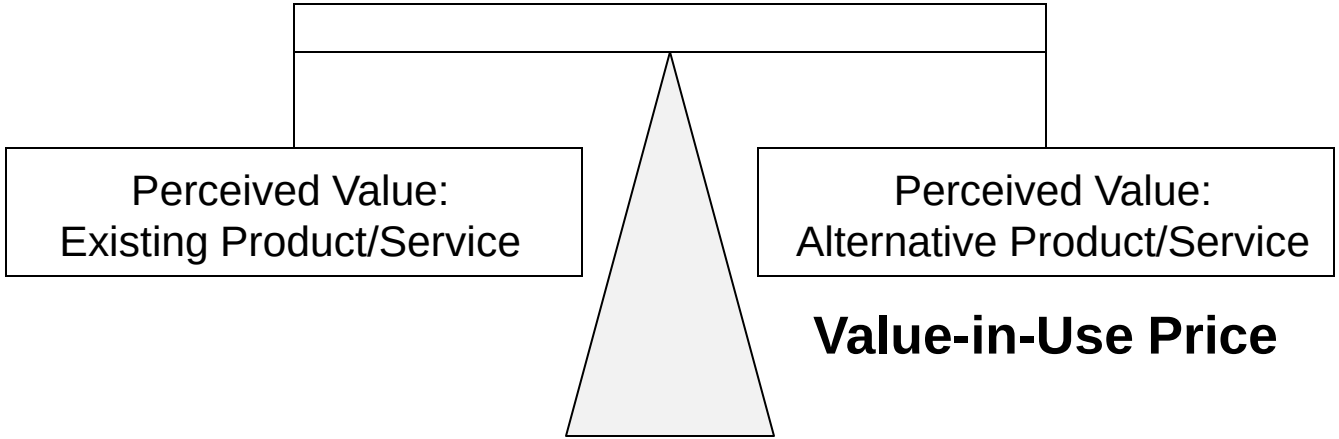
Acme LUX LED light bulbs in 3 tiers:

Best: Light output of 1700 Lumens, equivalent to 100W incandescent bulb. Price at $30

Better: Light output at 800 Lumens, equivalent to 60W incandescent bulb. Price at $20

Good: Light output of 150 Lumens, equivalent of 25W incandescent bulb. Price at $10

Pricing Techniques: Value-In-Use



Description: Set prices based on product or service's value to the customer
Example: Rhino Shield ceramic coating lasts 25 years; "never paint again"

Sample Calculations for Acme Example: See next slide

Pricing Techniques: Value in Use

Variable	Data	Description
Existing light bulbs: Price	$5	Price of existing halogen light bulbs
Existing light bulbs: Life	6 mo.	Life expectancy in difficult conditions
Existing light bulbs: Labor	$20/unit	Labor cost to replace light bulbs
Existing light bulbs: Quantity	100	Quantity of light bulbs to be replaced
Acme LUX light bulbs: Price	VIU	Value in use price we wish to calculate
Acme LUX light bulbs: Life	24 mo.	Life expectancy in difficult conditions
Acme LUX light bulbs: Labor	$20/unit	Labor cost to replace light bulbs

Example

Pricing Techniques: Value in Use

Annual Light Bulb Cost = Cost for Parts (Light Bulbs) + Cost of Labor (to Replace Light Bulbs)

= 100 light bulbs * $5/ each * 2 changes/ year + 100 light bulbs * $20/each * 2 changes/ year

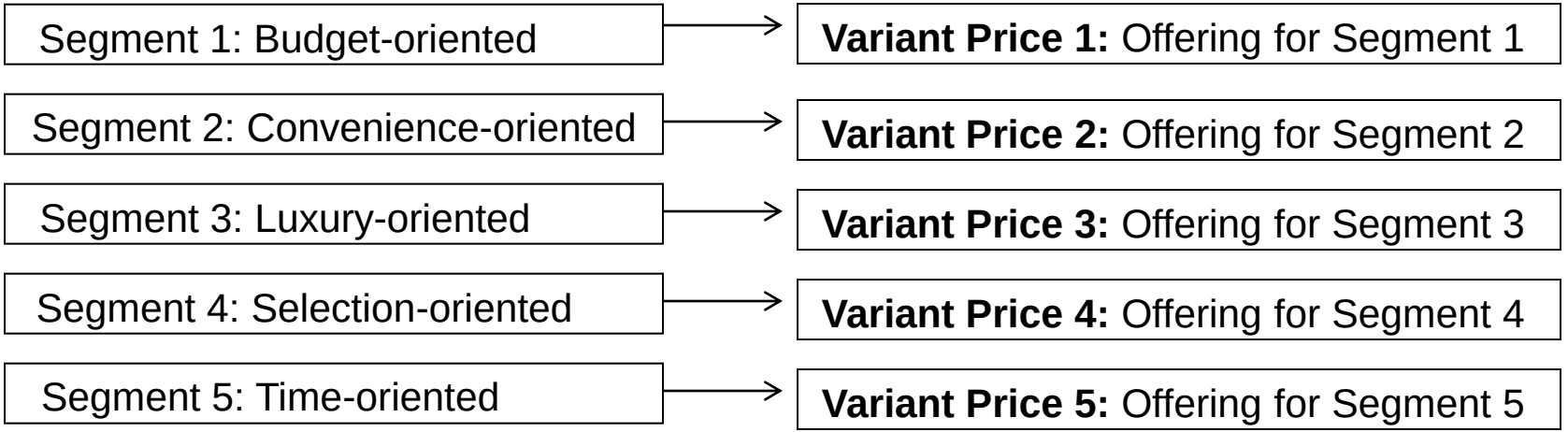
= $1,000/ year + $4,000/ year = $5,000/ year

$5,000
= 100 light bulbs * $VIU/ each * 0.5 changes/ year + 100 light bulbs * $20/ each * 0.5 changes/ year

VIU = $80 each for the Acme LUX LED light bulb

Example

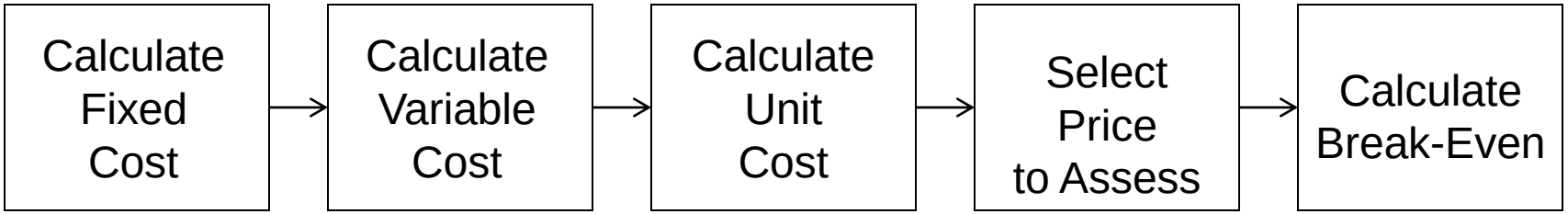
Pricing: Variant



Description: Set different prices for different variants, for different segments
Example: Volkswagen sells different branded cars to different segments

Sample Calculations for Acme Example:
Target durability-oriented segment; Find out what they expect
Durability-oriented segment: Wants vibration resistance and crush resistance
Acme LUX LED light bulb excels in vibration and crush

Pricing Assessment: Break-Even



Acme Example:

Calculate fixed cost: Acme has a fixed cost of $200,000 for the project

Calculate variable cost: Acme spends $10 per unit on variable cost

Calculate unit cost: Unit cost = $10 + ($200,000 / 20,000) = $20

Select price to assess: We expect to charge $40 per unit

Calculate Break-Even: Use the following formula:

Break-even = (Fixed Cost) / (Price – Unit Cost)
= ($200,000) / ($40 - $20) = 10,000 units

Pricing Assessment: NPV Capital Budgeting

Example: Acme wants to know if its proposed Acme LUX LED light bulbs will meet its organizational objective of generating 10% ROI.

1. Determine initial investment: Acme expects an initial investment of $250,000, which equates to a (- $250,000) cash flow in year zero.

2. Select price to assess: Acme plans to sell the units for $40 each.

3. Forecast unit sales: Based on sales of similar units, Acme forecasts sales of 2,000 units in year one, 2,500 in year two, and 3,250 in year three.

Pricing Assessment: NPV Capital Budgeting

Example: Acme wants to know if its proposed Acme LUX LED light bulbs will meet its organizational objective of generating 10% ROI.

4. Calculate cash flows: With the price and unit quantities established, we can calculate the cash flow from the units in year one as $40 * 2,000 = $80,000, in year two as $40 * 2,500 = $100,000, and year three as $40 * 3,250 = $130,000.

5. Calculate net present value: We enter our information into the NPV equation: NPV = [(-$250,000) / (1 + 0.10) ^ 0] + [($80,000) / (1 + 0.10) ^ 1] + [($100,000) / (1 + 0.10) ^ 2] + [($130,000) / (1 + 0.10) ^ 3] = $3,043; NPV > 0

Pricing Assessment: IRR Capital Budgeting

Example: Acme wants to know the internal rate of return (IRR) for its Acme LUX LED bulbs, and if the IRR will meet the minimum internal return of 10%.

1. Determine initial investment:: Acme expects an initial investment of $250,000, which equates to a (- $250,000) cash flow in year zero.

2. Select price to assess: Acme plans to sell the units for $40 each.

3. Forecast unit sales: Based on sales of similar units,
Acme forecasts sales of 2,000 units in year one, 2,500 in year two, and 3,250 in year three.

Pricing Assessment: IRR Capital Budgeting

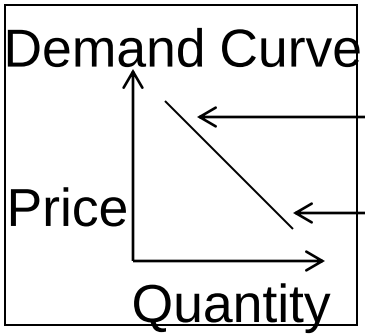
Example: Acme wants to know the internal rate of return (IRR) for its Acme LUX LED bulbs, and if the IRR will meet the minimum internal return of 10%.

4. Calculate cash flows: Just as with the net present value model,
we calculate the cash flow as $40 * 2,000 = $80,000 in year one,
$40 * 2,500 = $100,000 in year two, and $40 * 3,250 = $130,000 in year three.

5. Calculate internal rate of return: Enter the information and set NPV = 0 and solve for IRR
NPV = [(-$250,000) / (1 + IRR) ^ 0] + [($80,000) / (1 + IRR) ^ 1] + [($100,000) / (1 + IRR) ^ 2]
+ [($130,000) / (1 + IRR) ^ 3] = 0
Calculating for IRR, we get 10.6%

Demand Curves: Elastic

$$\text{Elasticity} = \frac{\text{(Percentage change in quantity demanded)}}{\text{(Percentage change in price)}}$$

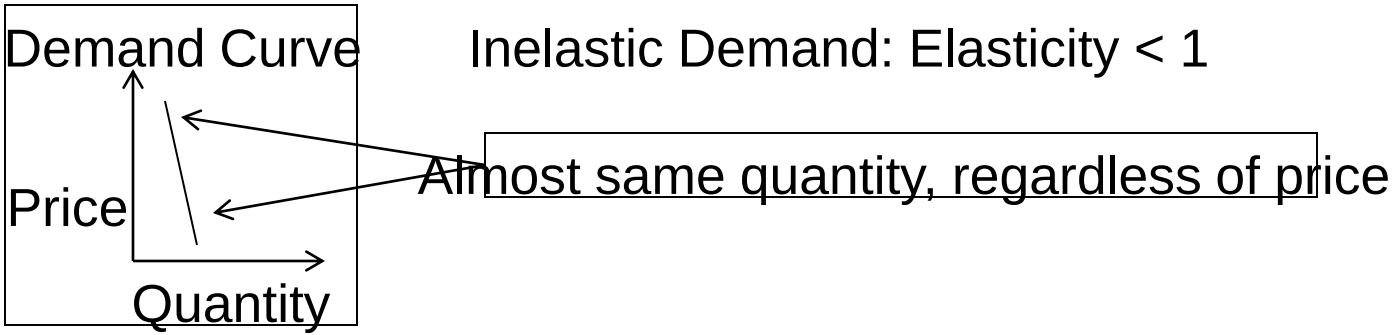


Elastic Demand: Elasticity > 1

Price high → Purchase fewer items

Price low → Purchase more items

Demand Curves: Inelastic



Demand Curves: Elasticity

Price	Quantity
$10	5
$20	4
$30	3
$40	2
$50	1

(P1, Q1) = ($10, 5)

(P2, Q2) = ($50, 1)

$$\text{Elasticity} = \frac{\text{(Percentage change in quantity demanded)}}{\text{(Percentage change in price)}}$$

$$= [\,(Q2 - Q1) / Q1\,] / [\,(P2 - P1) / P1\,]$$

$$= [\,(1 - 5) / 5\,] / [\,(\$50 - \$10) / \$10\,] = -0.80 / 4 = -0.20$$

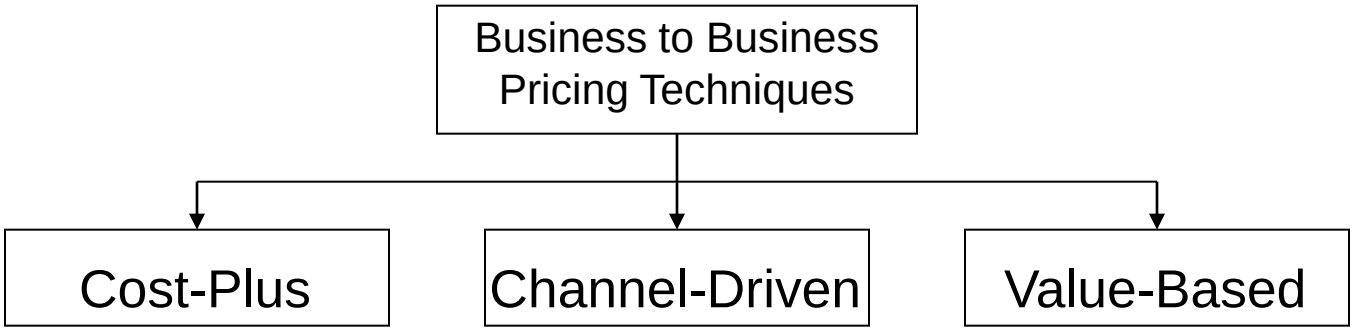
Demand Curves: Optimal Pricing

Price	Quantity	Revenue	Cost	Profit
$10	5	$10 * 5 = $50	$20 * 5 = $100	$50 - $100 = ($50)
$20	4	$20 * 4 = $80	$20 * 4 = $80	$80 - $80 = $0
$30	3	$30 * 3 = $90	$20 * 3 = $60	$90 - $60 = $30
$40	2	$40 * 2 = $80	$20 * 2 = $40	$80 - $40 = $40 *
$50	1	$50 * 1 = $50	$20 * 1 = $20	$50 - $20 = $30

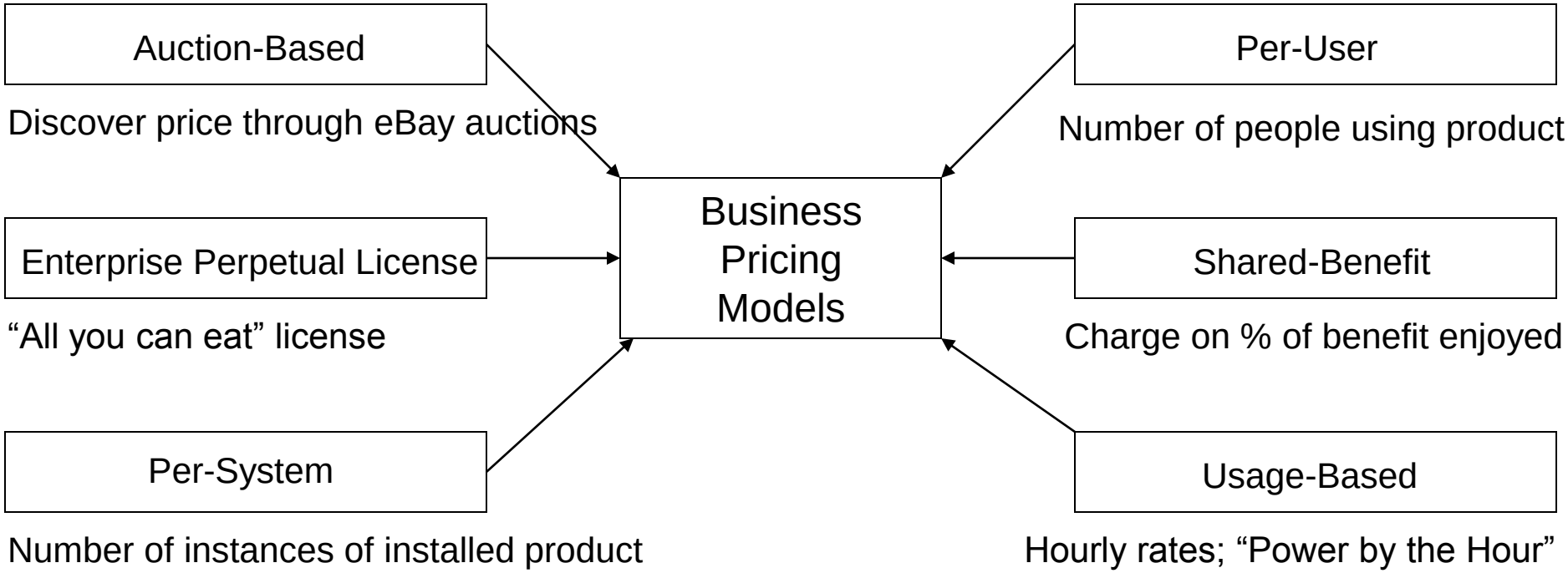
Optimal Pricing Table for Acme LUX LED Light Bulbs

Max. profit at $40

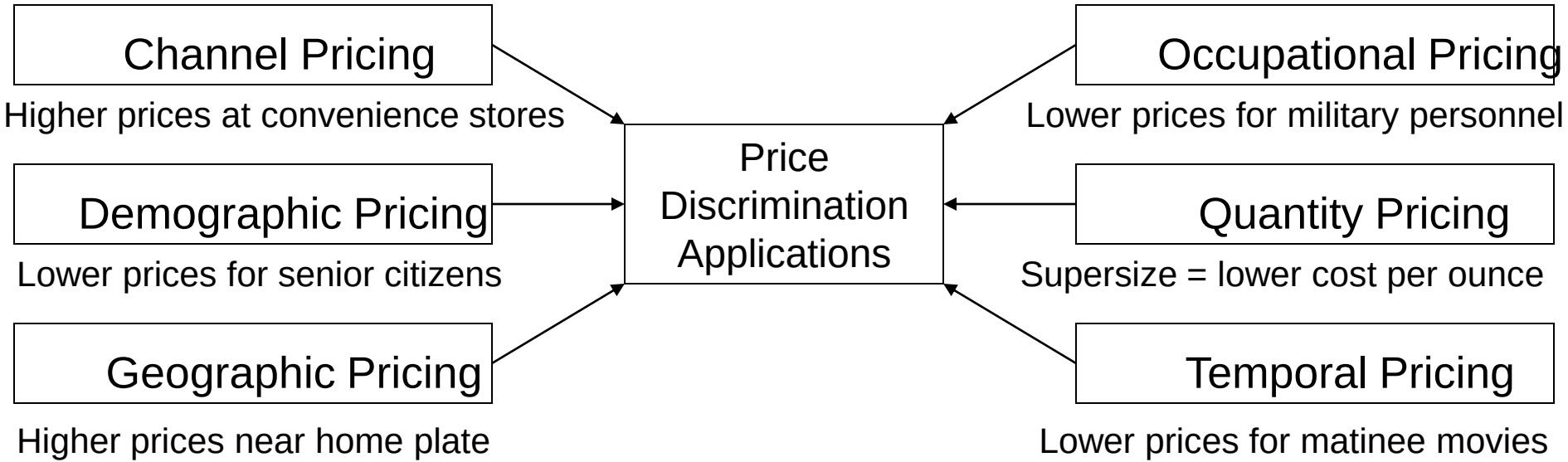
Business Market Pricing Techniques



Business Market Pricing Models



Price Discrimination



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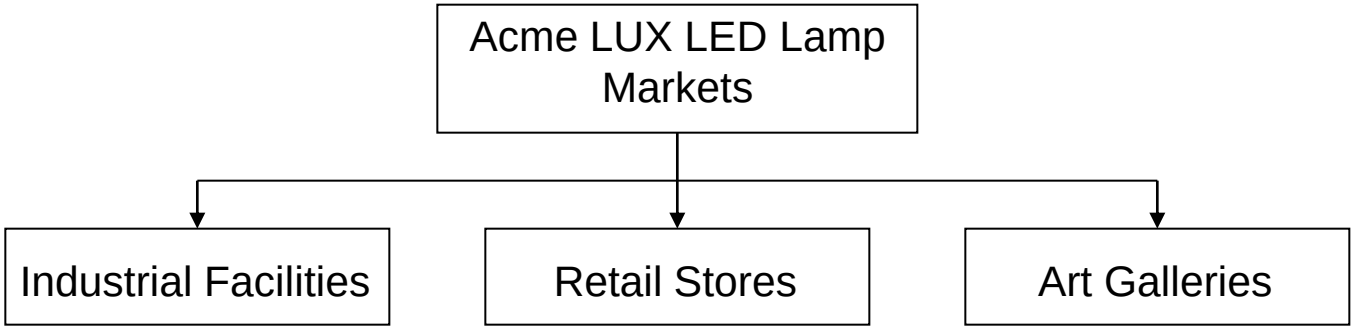
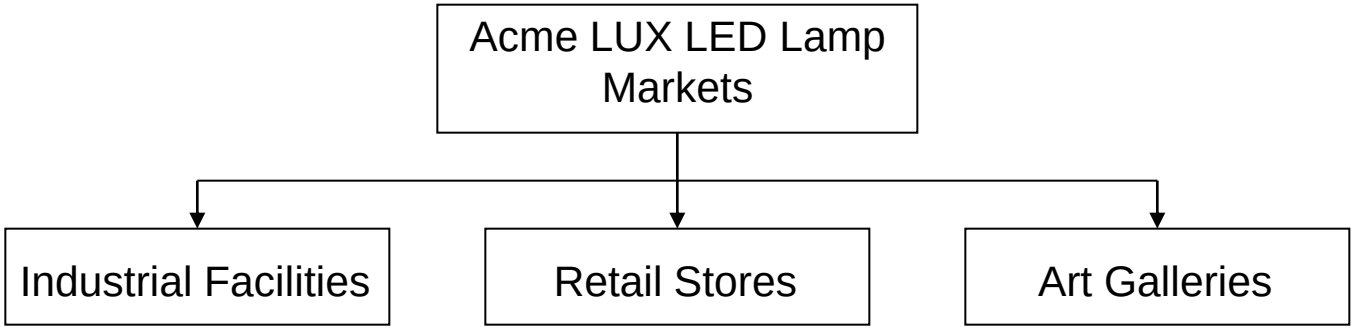


Segment	Reservation Price	Profit per segment
A: Industrial plants	$40	1% * 300,000 * ($40-$20) = $60,000
B: Retail Stores	$40	20% * 46,000 * ($40-$20) = $184,000
C: Art Galleries	$40	80% * 6,700 * ($40-$20) = $107,200
Total		$120,000 + $184,000 + $107,200 = $351,200

Profit at Fixed Price →

Price Discrimination



Segment	Reservation Price	Profit per segment
A: Industrial plants	$30	2% * 300,000 * ($30-$20) = $60,000
B: Retail Stores	$50	15% * 46,000 * ($50-$20) = $207,000
C: Art Galleries	$80	60% * 6,700 * ($80-$20) = $241,200
Total		$60,000 + $207,000 + $241,200 = $508,200

Profit at Varying Prices →

Check for Understanding

Topic	Description
Techniques	Identify different pricing techniques and when to apply them
Assessment	Check profit impact of different prices
B2B & B2C	Explain pricing models for consumer and business markets
Discrimination	Define price discrimination and its effect on profitability