

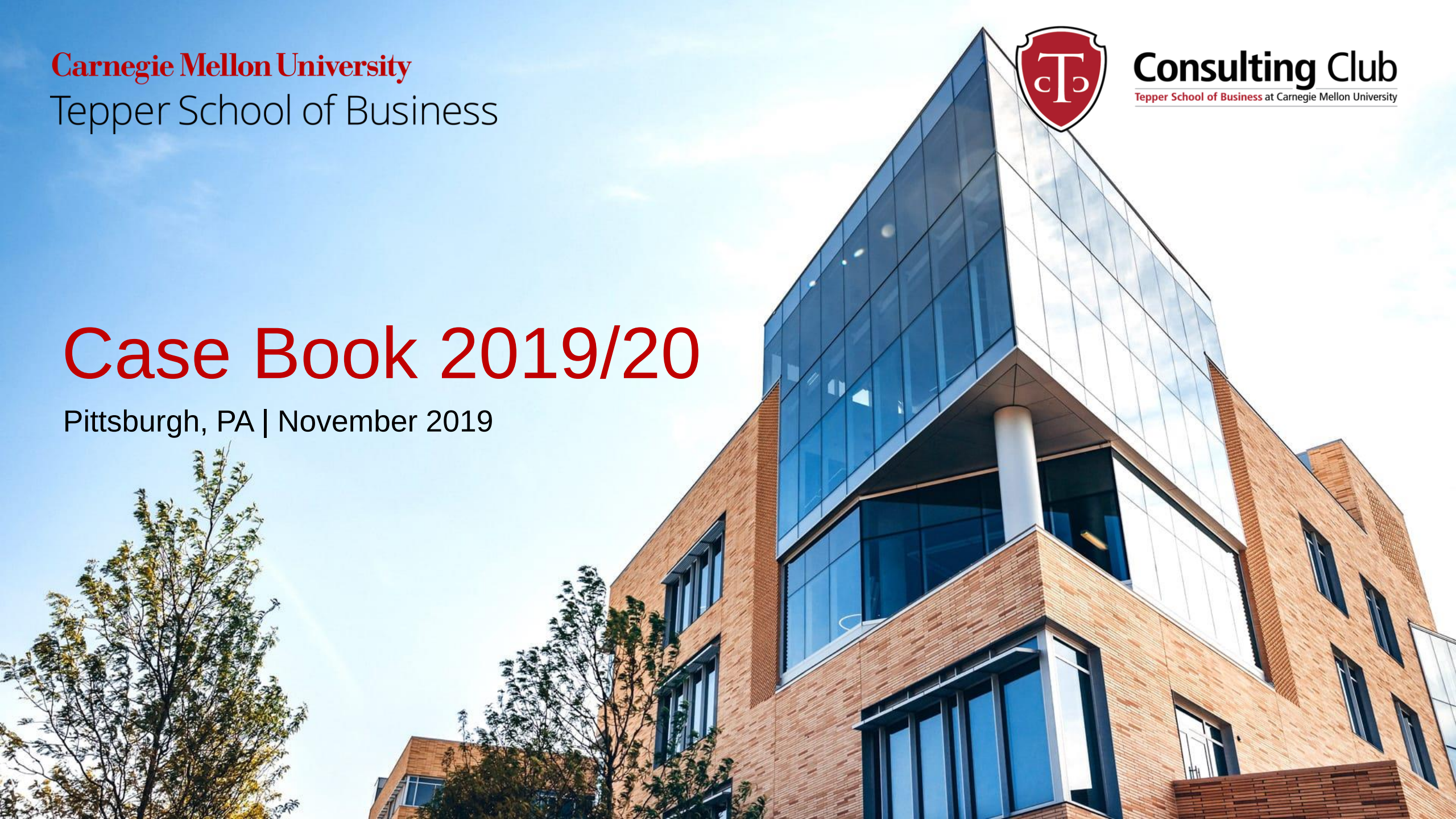
Carnegie Mellon University
Tepper School of Business



Consulting Club
Tepper School of Business at Carnegie Mellon University

Case Book 2019/20

Pittsburgh, PA | November 2019





This book is designed to help you prepare for and succeed at case interviews. It has been put together by the Tepper Consulting Club Board (TCC) of 2019, based on our experiences, knowledge and materials from past classes and TCC board members.

This book includes a brief overview of how a case interview is typically conducted, some high-level information on key concepts and frameworks that are useful in case interviews and practice cases. It is not meant to be your only case prep resource, or to serve as your only source of practice cases.

*Happy Casing,
Your TCC Board*

Acknowledgements

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Special thanks: Tepper Consulting Club Classes of 2016 and 2017 for starting this case book & to the Tepper Consulting Club Board of 2019 for the redesign

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- Frameworks to Approach Cases
- Useful Concepts for Case Interviews
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- **What is a case interview?**

- A case interview is used by firms to assess your problem-solving skills using scenarios and information based on real business problems. These cases are not meant to be trick-questions, rather to serve as a reflection of the kind of work consultants do on a regular basis.

- **What firms look for**

- Approach – how you structure ambiguous problems
- Analysis – identification of key issues in a scenario and how you use data to develop conclusions
- Insights from the industry, an adjacent industry or general business understanding
- Creativity in thinking and problem solving
- Communication – how you articulate your ideas, observations and conclusions in a fast-moving discussion

- **Types of cases**

- Interviewer led – also known as the “command and control” style where the interviewer asks a series of questions to be solved during the case
- Interviewee led – the candidate is read an initial prompt and is expected to drive the discussion and the case forward
- Written – each candidate gets a packet of information, generally printed slides including text and graphs, which they have to analyze during a set amount of time with little to no interviewer intervention

- **What to bring to a case interview**

- Plain paper (20 pages), pens, padfolio, and copies of your resume

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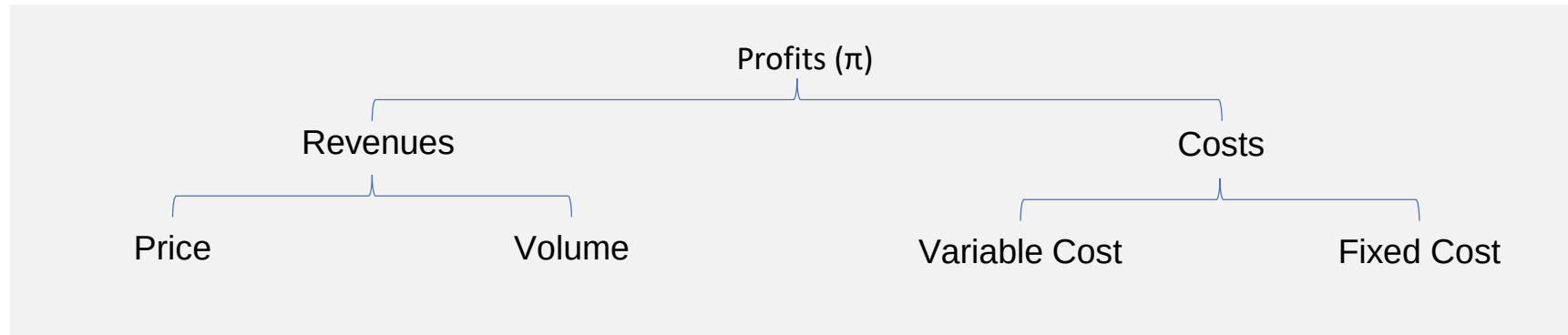
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Frameworks to Approach Cases – Table of Contents

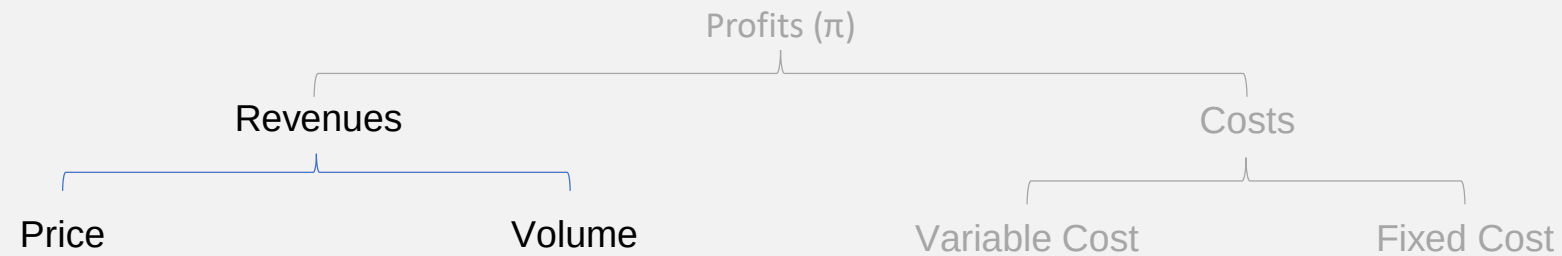


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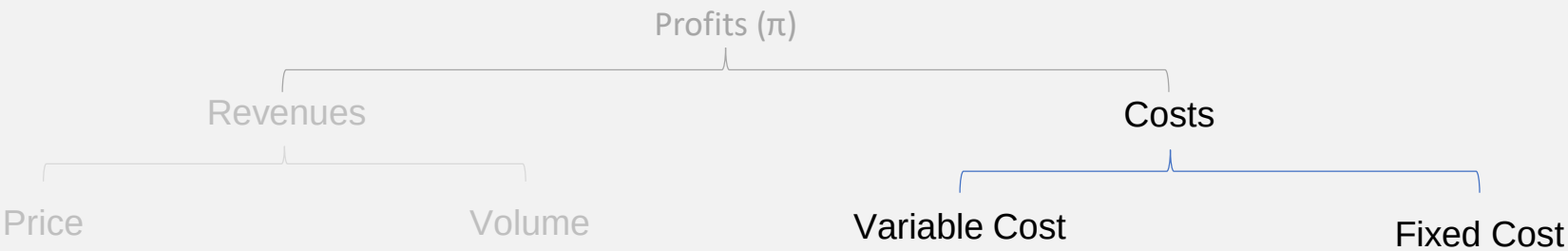
- Profitability is the most common type of case, many times it is a sub-section of a larger case
- How to identify a profitability case
 - The client has experienced a decline in profits ...
 - Your client has seen its market share drop ...
 - Margins for the client have been falling ...
- A “profit-tree” is the typical approach for a profitability case



Profitability Analysis – Revenue Drivers

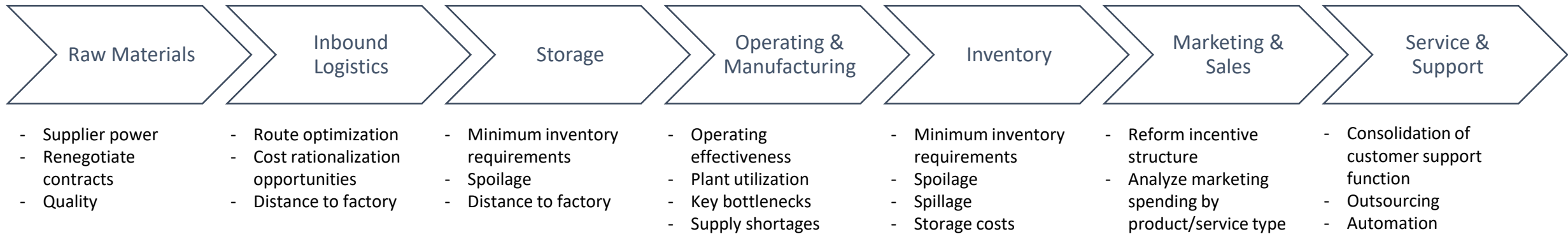


Aggregate	Unit Price	x	Units Sold
Product Segment	Unit Price	x	Prod A Units Sold
	Unit Price	x	Prod B Units Sold
	Unit Price	x	Prod C Units Sold
Customer Segment	Average Sale	x	Number of Customer Type A
	Average Sale	x	Number of Customer Type B
	Average Sale	x	Number of Customer Type C



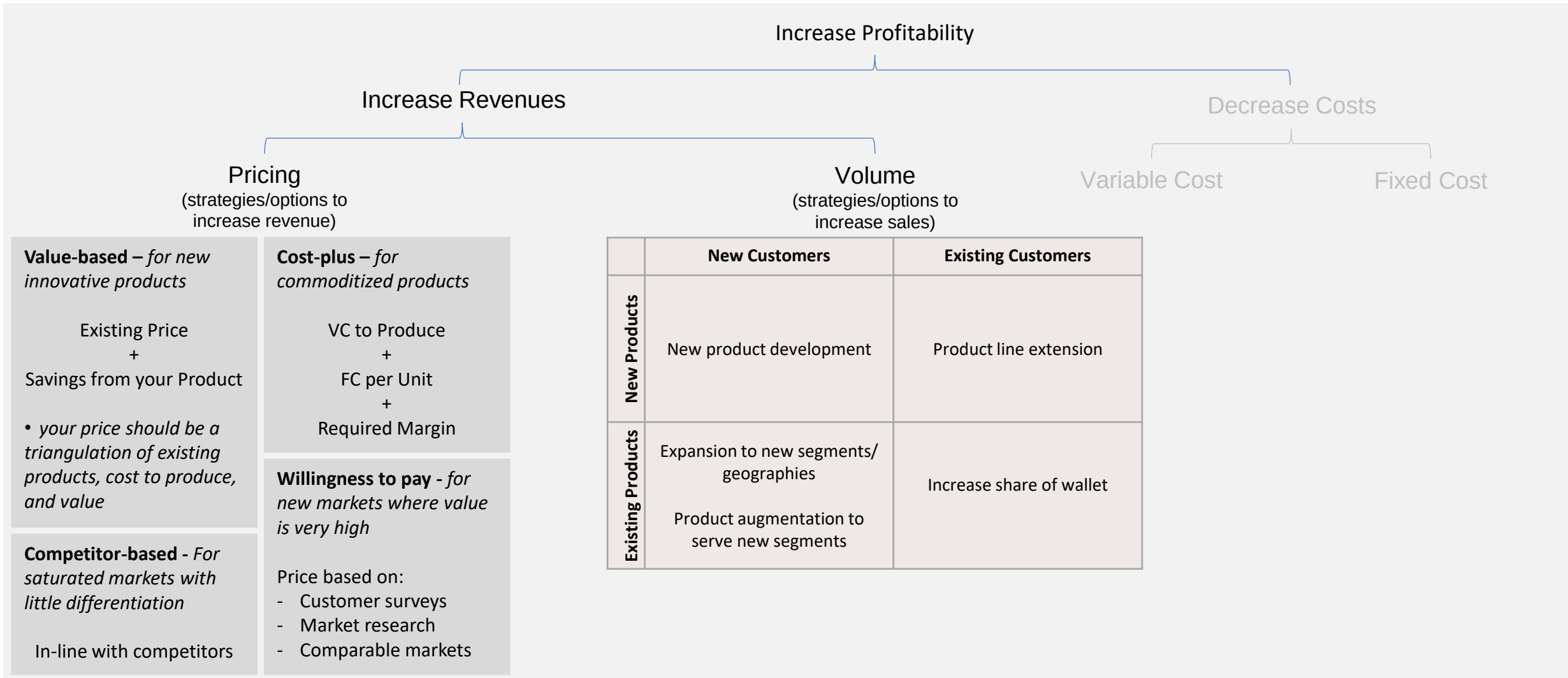
Aggregate	$\left[\text{Number of Units} \times \text{Units Sold} \right] + \text{Fixed Cost}$		
Service Cost	Average Cost	x	Number of Customer Type A
	Average Cost	x	Number of Customer Type B
	Average Cost	x	Number of Customer Type C
Value Chain	* see topic notes		

- Useful framework for in-depth cost analysis
- It is important to tailor the framework to the business at hand based on the supply chain functions in the business / industry

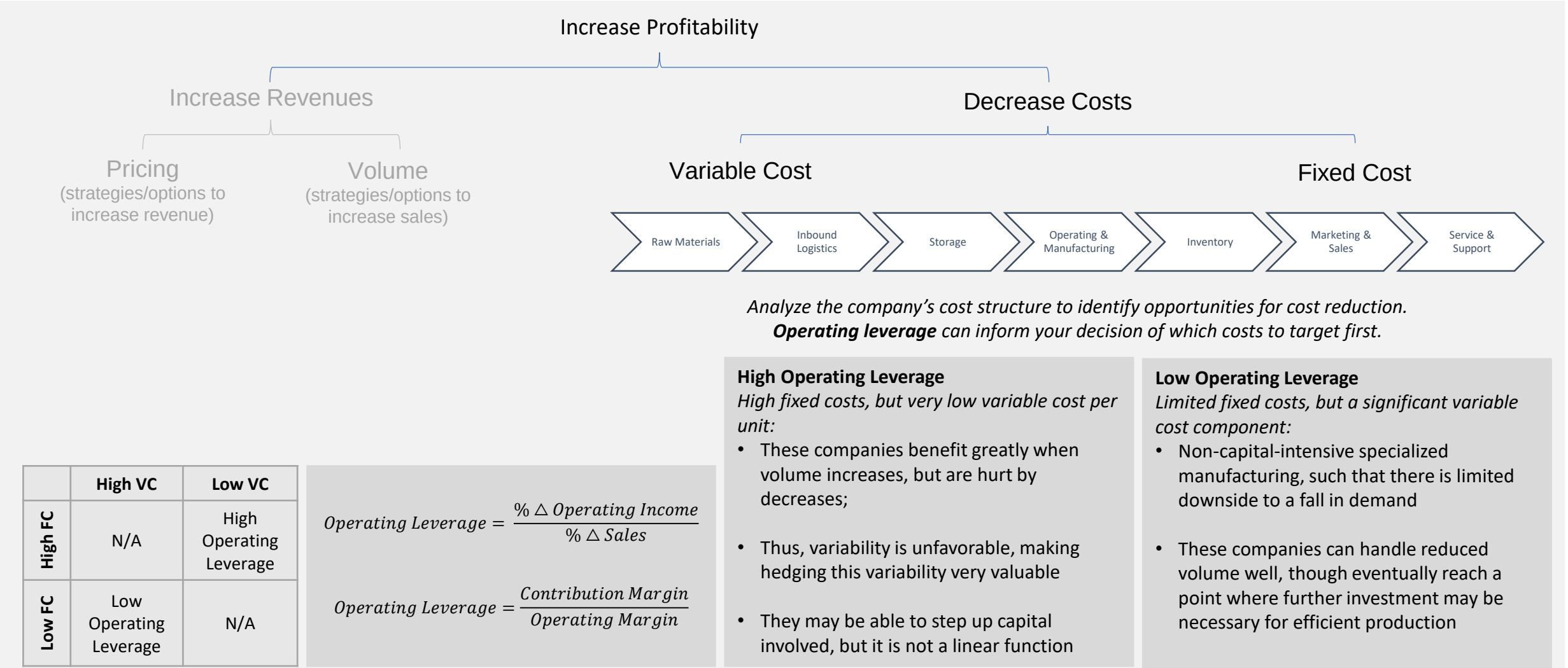


Increasing Profitability

- This is a special type of a profitability analysis case, and focuses on increasing a company's revenues



- This is a special type of a profitability analysis case, and focuses on increasing a company’s revenues



- This approach can be used to analyze the following kinds of problems
 - Investment decisions
 - Project / program launch
 - Acquisitions

Value / Benefit

Greater profit
from ...

OR

Incremental
revenue from ...

- Reducing costs (bulk purchasing, distribution, advertising, R&D)
- Access to higher margin customers or products

- Cross-selling of products
- Ability to create new products
- Access to new markets

>

Investment / Costs

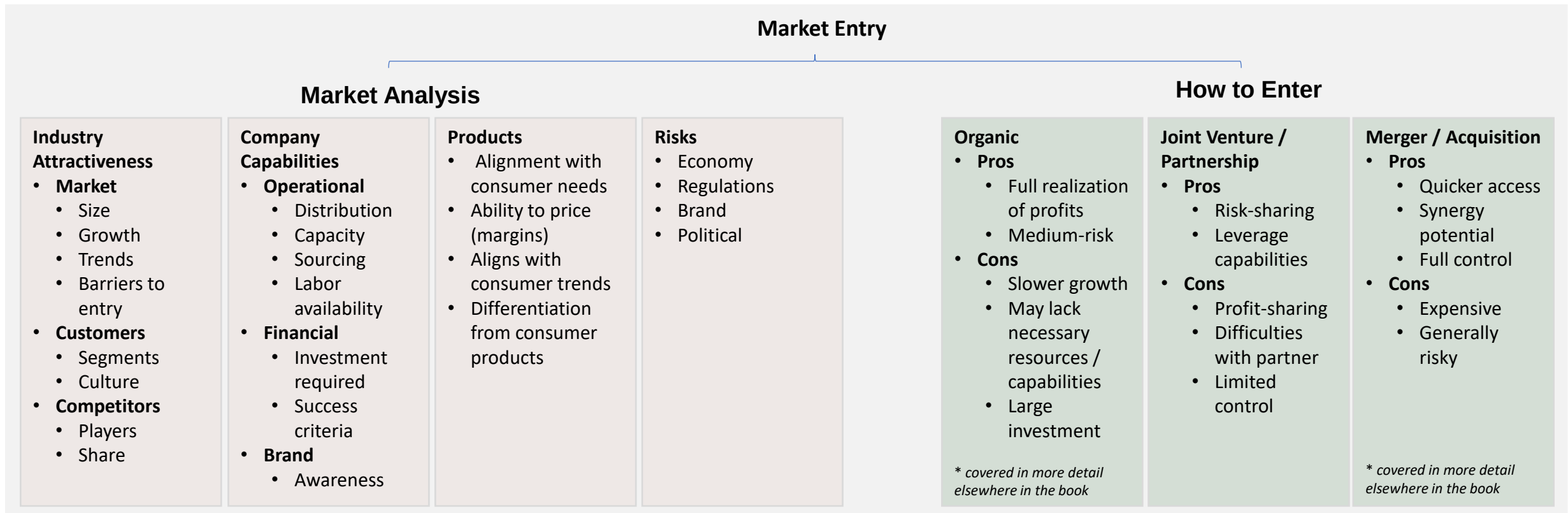
- Actual investment (the technology, software, equipment, etc)
- Installation costs
- On-going maintenance
- Follow-on investments
- Additional resources
- Opportunity cost

+

Risks

- Cannibalization
- Change management
- Damage to brand
- Regulation (FTC approval?)
- Potential that you do not realize projected value
- Exit strategy

- This approach is useful in determining new or growth opportunities for businesses
- How to identify a market entry case
 - Our client is considering investing in an operation in ...
 - Our client would like to expand its business ...
 - Our client is considering an acquisition in Country X ...
 - Our client is looking to introduce a new product into Market X ...



- Use this model to approach merger or acquisition cases

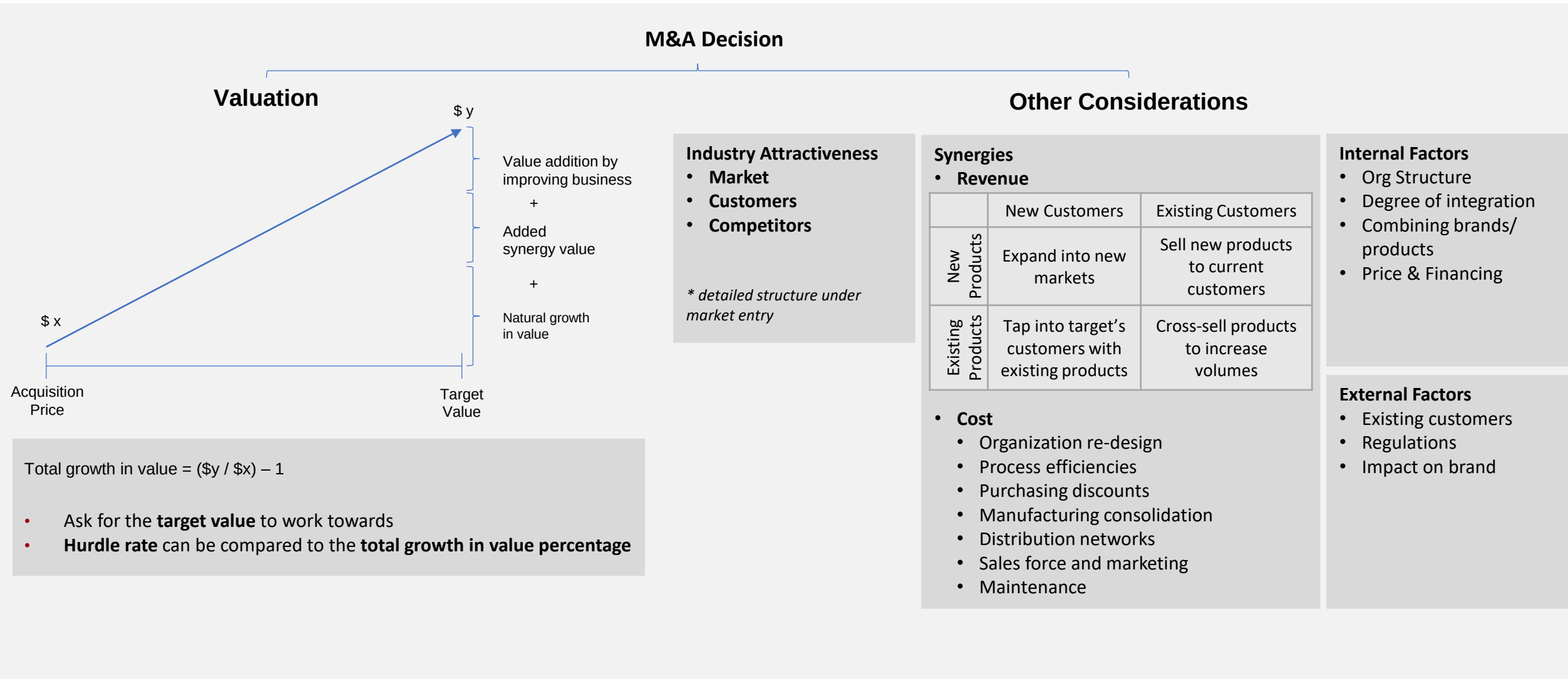


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Useful Concepts – Table of Contents



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Time Value of Money	19
Industry Analysis	20
Company Analysis	21
Product Analysis	22
Environment, Social, and Government	23

Breakeven Analysis



- **New business ventures** or **product introductions** can be evaluated using a breakeven analysis
- Breakeven analysis is an important consideration for every case that involves **capital investment**

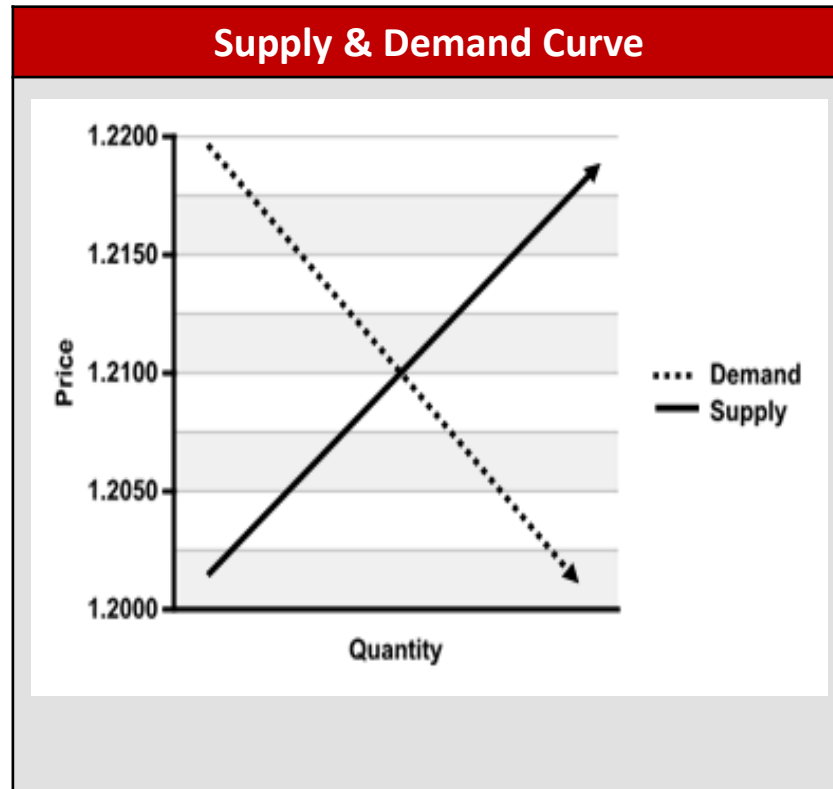
Breakeven	$\text{Revenues} = \text{Fixed Costs} + (\text{Unit Variable Cost} \times \text{Sales Quantity})$
Breakeven Quantity	$\text{Breakeven Quantity} = \frac{\text{Fixed Costs}}{(\text{Unit Sales Price} - \text{Variable Cost per Unit})}$
Contribution Margin	$\text{Contribution Margin} = \text{Revenues} - (\text{Average Price} \times \text{Total Sales})$
Contribution per Unit	$\text{Contribution Margin per Unit} = \text{Sales Price} - \text{Variable Cost per Unit}$

Time Value of Money

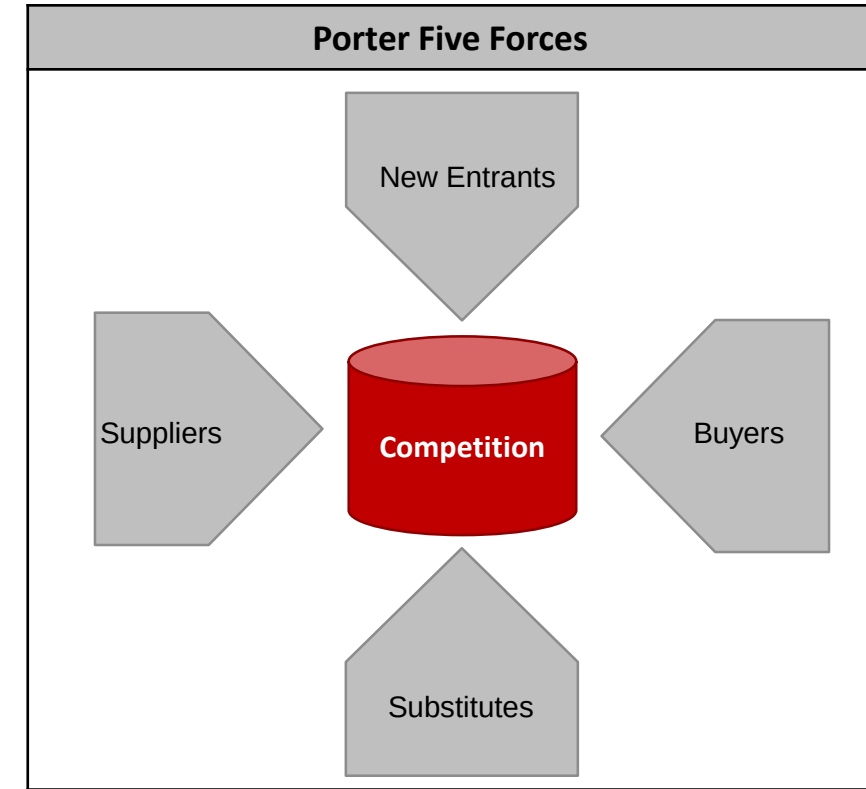


- Money is worth more now than in the future – it is important to take into account the time value of money when making investment decisions

Present Value of Cash Flow at time “t”	$\text{Present Value} = \frac{\text{Cash Flow}}{(1 + r)^t}$
Net Present Value of a Project	$NPV = CF_0 + \frac{CF_1}{(1 + r)^1} + \frac{CF_2}{(1 + r)^2} + \frac{CF_3}{(1 + r)^3} + \dots + \frac{CF_t}{(1 + r)^t}$
Rule of 72	$\text{Years Required to Double Investment} = \frac{72}{\text{Compound Annual Interest Rate}}$
Example of Rule of 72	$\begin{aligned} \text{Interest Rate} &= 8\% \\ \text{Time to Double Investment with 8\% Interest} &= \frac{72}{8} = 9 \text{ years} \end{aligned}$



- Demand is a function of price, and understanding the price elasticity of demand is a critical step to form further assumptions about product volume change as a result of project adjustments



- Great framework for understanding market dynamics and business ecosystem
- Excellent framework to tailor for a Market Entry Case
- Great complementary framework for an M&A case
- *You want no new entrants, nor much competition, and a lack of substitutes (but do want complements), and favor power as both supplier and buyer, but don't want to face supplier power, nor be subject to buyer power*

5Cs Framework

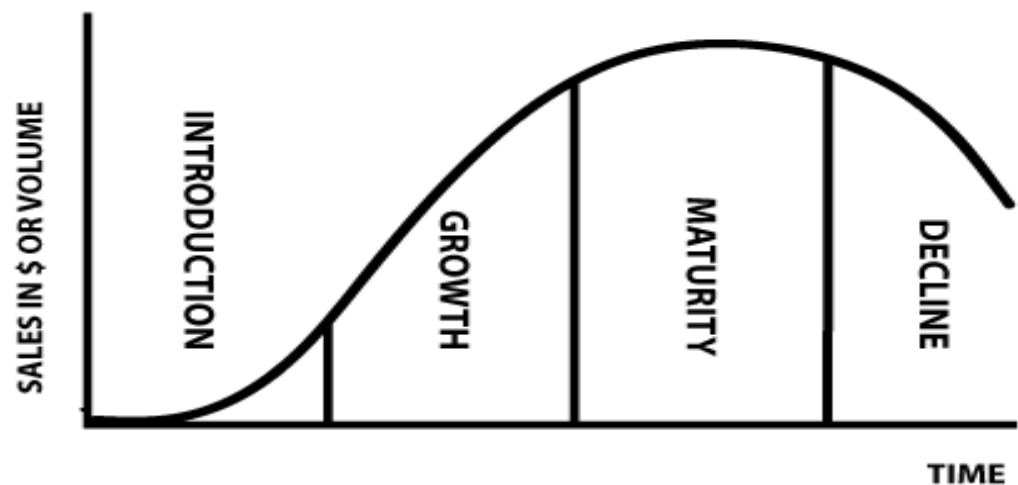
- **Customer**
Identifying market and size, segment market into demographic profiles, customer needs, loyalty
- **Company**
What are the company's core competencies, growth strategy, culture, how differentiated, brand
- **Competition**
Type of market competing in, number of competitors, products unique or commoditized, market share, strengths and weaknesses of competition
- **Context**
Macroeconomic view (inflation, unemployment, GDP, trade, currency), government impact & regulations, social & cultural influences
- **Complements**
The nice tag-alongs, such as mustard with sausage and a book on a train ride, for instance

4Ps Framework

- **Product**
How does it add value, how differentiated
- **Pricing**
Customers price sensitive, comparable products priced at, lowering price hurt brand image
- **Placement (distribution)**
Online, retail, wholesale, B2B vs. B2C, multiple channels, services associated with product
- **Promotion**
Generate awareness, brand image, reach target

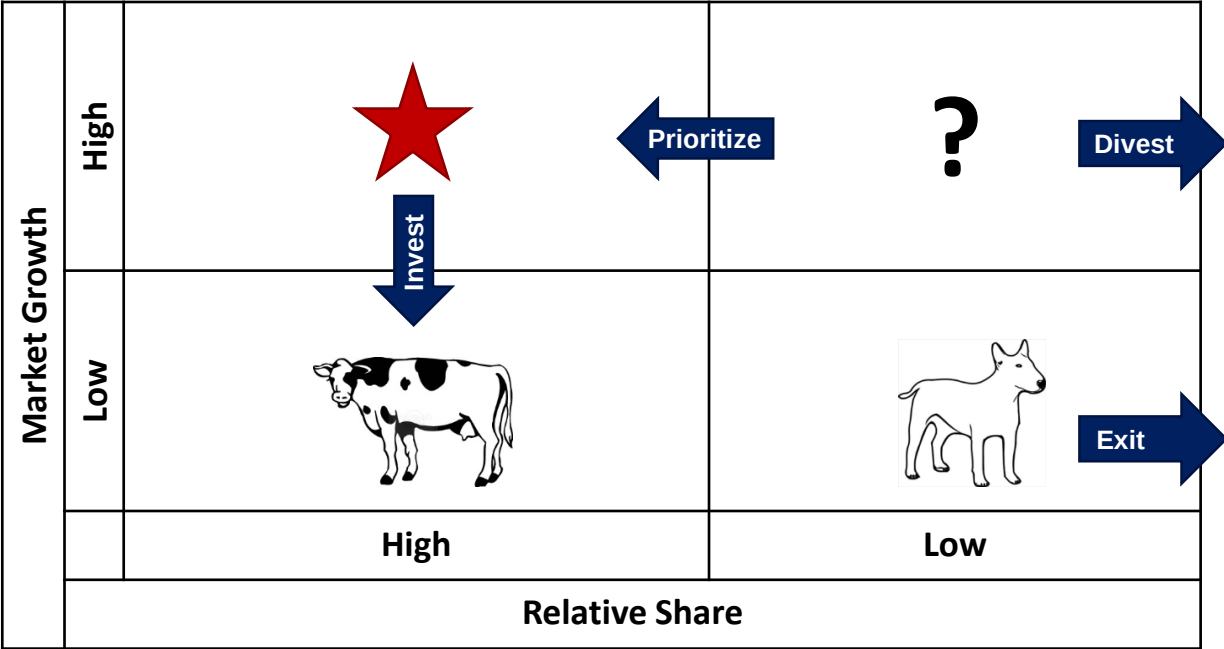
Product Life-Cycle

- Good for discussing business issues over time



BCG Growth Matrix

- Good for analyzing products or business across the dynamic borders of a market





- A great way to incorporate external factors in case analysis
- **Environmental** = Natural conditions; ie, how weather, climate, geography, and other physical features could be advantageous or a challenge
- **Social** = Public perception; ie, how people view a company and what it does
 - Ties often into Environmental
 - Can influence Government
- **Government** (aka regulatory / legal) = Political influences; ie, how bodies and direction can favor a company or hinder its plans
 - Think laws such as SarbOx, ACA, Dodd-Frank, emissions regulations
 - Also consider how corporate governance relates, as companies can head off nasty ideas with prudent management and proper foresight of impending doom

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Practice Cases – Table of Contents



Concept	Difficulty	Quants	Strategic Thinking	Slide Number
Auto Manufacturer	Easy	Medium	Easy	26
Vitamin Hub	Easy	Easy	Medium	32
Igloo Jets	Easy	Medium	Medium	38
Asset Manager	Medium	Medium	Medium	49
Leather Shoelaces	Medium	Medium	Hard	62
Greystone Partners	Medium	Medium	Hard	70
Printer Pump Manufacturer	Medium	Medium	Hard	80
Civic Arena	Medium	Medium	Hard	89
The Hi-Ho State University	Medium	Easy	Hard	97
GSIA United	Hard	Medium	Medium	105
Journey to Mars	Hard	Medium	Hard	119
EU Vehicles Emissions	Hard	Medium	Hard	126
The Flow of Rubber	Hard	Medium	Hard	134
Auto Part Shop	Hard	Medium	Hard	146
Private Jets	Hard	Medium	Hard	154
Big Box Retail	Hard	Easy	Hard	160
NailedIt!	Hard	Hard	Hard	167
Madataza	Hard	Hard	Hard	178

Written by: Mike NcNamee (Class of 2016)

Case Type: Market Analysis

Case Basics	
Delivery:	Interviewee-driven
Company:	N/A
Industry:	Automotive
Concept:	Market Entry
Difficulty Level:	Easy
Quants:	Medium
Strategic Thinking:	Easy

Note to the Interviewer:

- This is a fairly simple market analysis case that tests basic business concepts
- The difficulty of the case can be adjusted by requiring the candidate to derive more of the insights instead of giving the candidate the provided information
- The candidate should not jump to a conclusion based on the initial information but should instead think through the relevant market factors

Fit Interview Questions:

- What other companies and industries are you applying to?
- How do you define leadership?

This is not a company provided case.



Problem Statement:

- Our client, a large automobile manufacturer (think GM, Ford, Chrysler), has asked us to evaluate their \$10B after-market parts business where the manufacturer sells replacement parts and accessories for its vehicles
- The client would like to know: 1) Is there an opportunity to expand this business and 2) If there is, how should they do so?

Clarifying Questions:

- What is the client's competitive position in the market place?: The client is one of the three largest automobile manufacturers in the United States
- Do the competitors operate similar businesses?: Its two top competitors make parts for their own cars, however they are not as vertically integrated as the client and only focus on specific part categories. There are many smaller companies that focus on commodity-like auto parts.
- Who does the business sell to?: There are two groups of buyers for this business: dealers authorized to sell after-market parts, \$8B of revenue, and non-dealer service providers such as auto repair shops, \$2B of revenue
- Who are the non-dealer sellers?: The non-dealer sellers include merchandisers who specialize in auto parts and retailers who sell a diverse range of products.
- In regards to the client's operations: A majority of the costs associated with the business can be considered to be fixed costs, and the client's manufacturing facilities are fully depreciated and operate with excess capacity.



Products

- Parts can either be classified as platform-specific or universal, depending whether they are used specifically for the manufacturer's automobiles or they can be used across multiple models
- When the interviewee asks about products, present **Exhibit 2**

Notes on Exhibit 2:

- Candidate should quickly identify that the larger market is universal parts
- The candidate should inquire whether there is information on the growth or change in share between the two product types. No information is available, but the candidate can assume the share break down has not been changing
- A strong candidate will hypothesize about the different market characteristics for each part type
 - Platform-specific parts: Sold through dealers under warranty; high margins, low volume
 - Universal parts: Sold through many outlets; high turnover; strong competition; slim margins, high volume

Company and operations:

- Most of the costs associated with the business can be considered to be fixed costs, and the client's manufacturing facilities are fully depreciated and operate with excess capacity
- The client's parts are manufactured both in the United States and offshore.



Insights:

The interviewee should identify the following potential advantages for the client in the mass merchandiser market:

- The client may have a cost advantage due to its fully depreciated plants and excess capacity in an environment driven by fixed costs
- Because brand names are respected and valuable in maintaining an advantage, the client may have an advantage as a large, recognized automobile manufacturer
- The manufacturer's ability to produce a full-range of products can also serve as an advantage
- The interviewee should identify that pursuing the mass merchandiser market would involve growing its universal parts business

Some of the potential risks for pursuing the mass merchandiser market include:

- Potential investment for developing new universal parts
- If more companies with high brand power enter the market, the client may have to compete more on price
- Because there are few mass merchandisers, they will have significant bargaining power

Recommended solution:

The client should pursue selling universal parts to mass merchandisers because of its advantages combined with the market's growth.

Alternate recommendations are acceptable as long as the candidate makes a logical argument using the information provided in the case and sound business logic.



Exhibit 1: Market Analysis

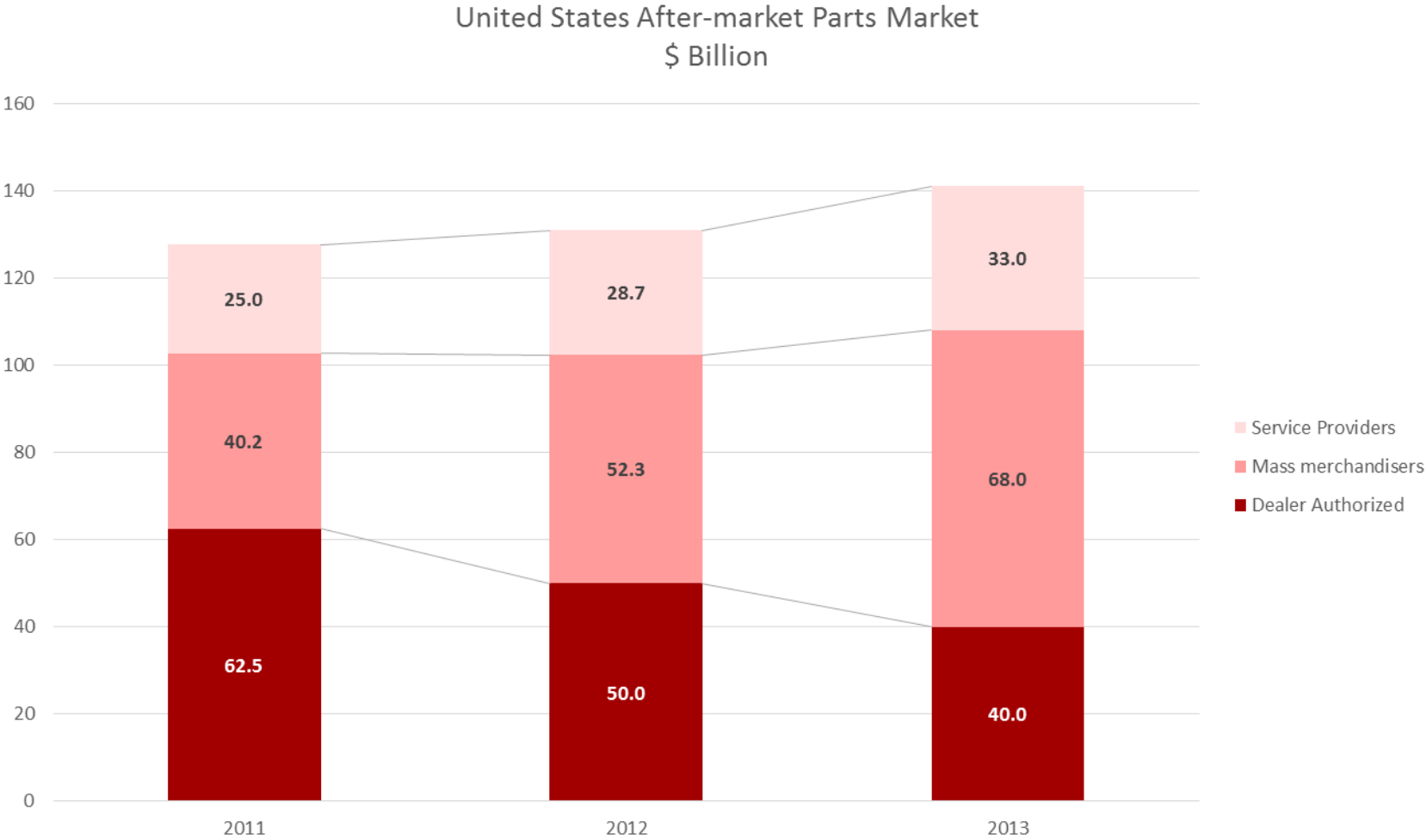
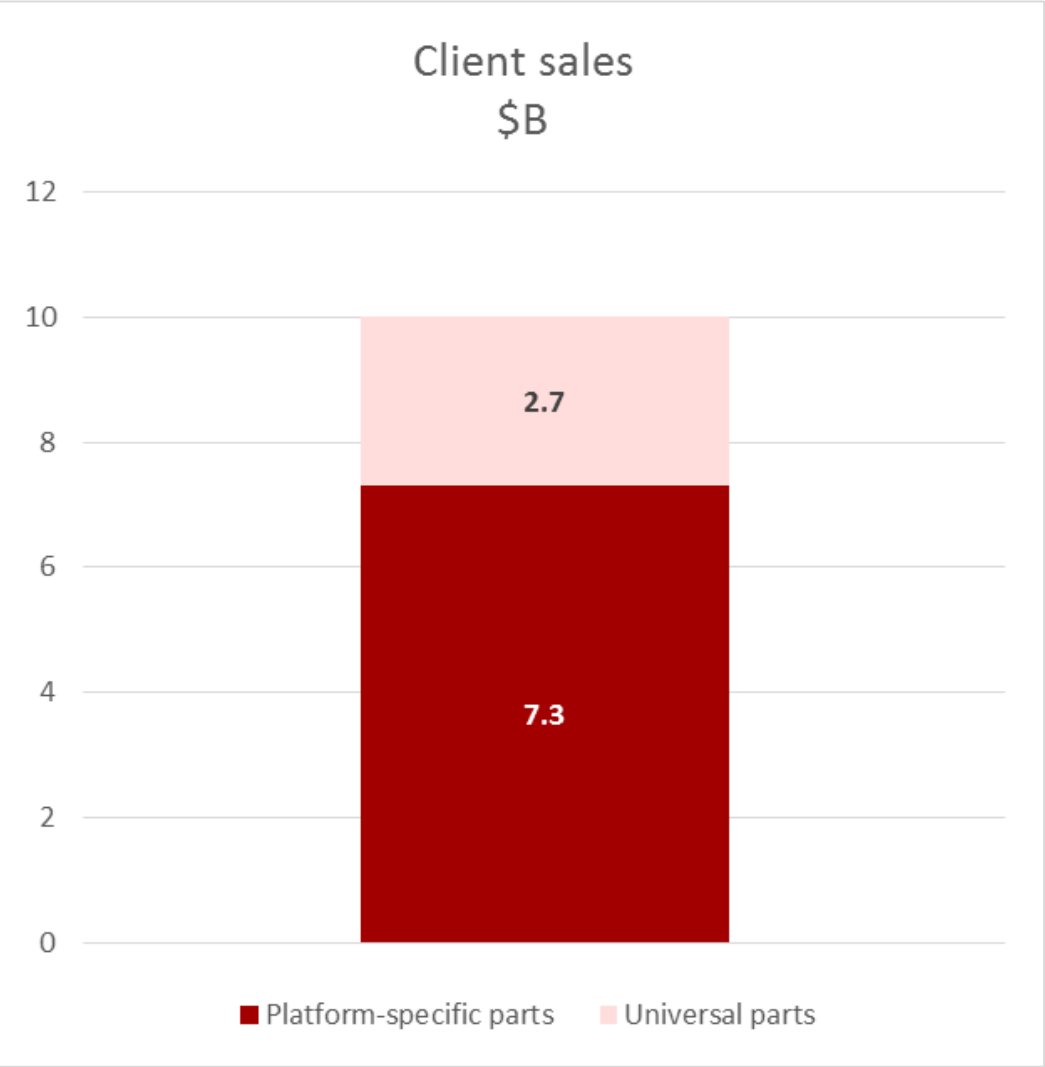


Exhibit 2: Product Categories



Platform-specific parts

- Body Panels
- Brakes
- Transmissions
- Engines

Universal parts

- Spark plugs
- Filters
- Hoses
- Batteries

Written by: Zach Grosz (Class of 2016)

Case Type: Investment/Marketing

Case Basics

Delivery:	Interviewer-Driven
Company:	McKinsey
Industry:	Retail
Concept:	Marketing/Strategy
Difficulty Level:	Easy
Quants:	Easy
Strategic Thinking:	Medium

Note to the Interviewer:

- This case is mostly about synthesizing information from one scenario to the next and focusing on what has been asked
- There are creativity aspects to this case, allow the candidate the length of rope to hang themselves as you continue to ask ‘what else’
- The candidates should not be given any information unless asked for or if it is absolutely necessary to nudge her/him in the right direction.

Fit Interview Questions:

- If not consulting, what other industry most interests you?
- What do you do like to do in your free time?
- Is there anything you would change about the way our recruitment has operated to date?

This is not a company provided case.

Problem Statement:

- Our client is a financial investor that is looking to invest in Vitamin Hub, a chain of 1000 stores across the United States. These stores are located in malls all across the country, and have a few standalone stores. The company focuses on Natural and medical foods, dietary foods, diet drinks, and supplements.
- What issues should we examine on behalf of our client?

Clarifying Questions:

- **How does VH operate?:** You can think of it as basically GNC – Retail outlet that sells vitamins and health products
- **What is the financial investor's goals?:** To bring this company into its broader portfolio. Buys and holds minority positions (10%-15%) for long periods, provides some expertise and is occasionally thought of as an activist investor. No specific rate of return is being searched. No specified horizon.
- **Why are they looking at Vitamin Hub?:** Our client is looking to diversify its portfolio and believes there is growth potential in Vitamins.
- **Who is currently in their portfolio?:** Currently they have focused on technology companies, having a background in online sales and marketing, as well as online distribution.
- **Is there a specific goal date/time?:** No specific rate of return or time horizon, just profitability.
- **How big is the VH?** VH has \$4B in revenue

Part 1: Issues to Examine

- It is important that a candidate recognize that this is not just a normal profitability case.
- A strong candidate will build a comprehensive structure that covers both the exit opportunities for the financial investor and how it would be received by the company, as well as the future profitability. There should be a split focus in the structuring, but the candidate should recognize that the fundamental need is to assess growth potential.

Investor Considerations

- Would there be a market to Exit
- How would this be received by company management? Can we work with them

Company/Market Considerations

- An excellent candidate will emphasize the importance in understanding the market and VH's competitive positioning.
- All candidates at a minimum should be able to cover the importance of understanding the company's operations, the customers, and the competitors.

After structuring, prompt the candidate with “What would you consider to be the market growth drivers for the vitamin industry”

- If asked to clarify, the question is what are the driving forces that would change the number of vitamins that are being purchased in the United States

Part 2: Growth Drivers

- This is the first creativity exercise of the case, allow the candidate to list what they believe the growth drivers are
- **If asked about VH's customers (or if the candidate is struggling), mention that the customers can be broken down into groups: 1) High Performance Athletes and 2) General Conditioning Customers**
- An excellent candidate will brainstorm ideas separately for each of these two categories. Some ideas:
A move towards healthier living by society, community driven groups, rise of crossfit, increased media exposure of athletes, more mature marketing by fitness companies, etc.
- **Allow the candidate to continue until they give up. Ask "Is there anything else you can think of" if there is a long pause and only move on when they indicate there is nothing else.**

"Okay let's move on. We were looking at the High Performance Athlete category and are wondering what might happen in one of our segments.

We know that in general one-third of young men aged 18-34 are heavy supplement users who spend \$50 per month on average. Right now 30% shop with us. What would the impact be on our profits if we were able to get that number up to 35%?"

- If asked: Provide the information that we are the largest player at 30% share, our next highest competitor is at 25% and the remainder of the market is highly fragmented.

Part 3: Increasing our share of the market

- Only when the candidate realizes that they do not have all available information, tell them the profit margin in 60%

Sample Calculation

NB: Because this is a market sizing, numbers may be different – that is fine.

300M people in the US

150M men (300M / 2) assuming equal number of men and women

30M 18-34 year old men (150M / 5) assuming uniform distribution 0-80 gives us five 16-year tranches

10M 18-34 year old men who are heavy supplement users (30M / 3) from Question

3M 18-34 year old men who are heavy supplement users and are our customers (10M * 30%) from Q

If we increased to 35% then we would have 3.5M customers or **500k more customers**.

Revenue Increase = 500k * 50\$/month * 12 months/year = \$300M / year

Or Equivalently:

Old Revenue = 3M * 50 * 12 = \$1.8B

New Revenue = 3.5M * 50 * 12 = \$2.1B → Difference of \$300M

Profit = Revenue * Profit Margin = 300M * 60% = \$180M/year

There are many acceptable answers here, as long as the assumptions are reasonable.

Next Prompt: “Do you think that an increase from 30% to 35% is reasonable?” “How would you go about doing that?”

Part 4: Increasing Customers

- The candidate should focus their answers on the 18-34 year old male heavy supplement user demographic. This is again a creativity exercise. There is no real right answer here.
- Some suggestions:
Advertising where they would be located (health food stores, gyms, etc), promotions, other marketing ideas
Leveraging revenue synergies based on the firm's expertise to sell online
Providing complementary products, cross-branding to sell in whole foods or healthy stores, etc.
- An excellent candidate will focus only on the target segment.

Final Prompt: “We found that Wal-Mart has begun to start selling supplements, are you worried about this?”

A fantastic candidate would note that this is a 3B Revenue company and about half (depending on assumptions) appears to be with the 18-34 year old heavy supplement user demographic and it has a 60% margin. There is likely a community aspect or something else that people get when visiting VH in terms of expertise advice. This is not typically where Wal-Mart plays.

In general the answer should be well reasoned on either the similarities of VH to Wal-Mart (both retail stores) or the differences (previously mentioned). It should follow the answers that were previously provided.

Note: This is the end of the case, there should not be time left for a recommendation

Written by: David Dierker (Class of 2017)

Case Type: Profitability M&A

Case Basics	
Delivery:	Command & Control
Company:	McKinsey & Co.
Industry:	Airlines
Concept:	Profitability/M&A
Difficulty Level:	Easy
Quants:	Medium
Strategic Thinking:	Medium

Note to the Interviewer:
• This is a beginner level case starting with basic profitability and ending with M&A integration • Some concepts may be unfamiliar to people new to cases, so guide the interviewee by asking what they are solving for and helping them through problem structuring • This is a very mechanical case that should challenge problem set-up and execution of the candidate

Fit Interview Questions:
• What is the most important characteristic you are looking for in a consulting company? Why? • What's the next most important characteristic? Why? • Describe a new business concept you've learned since starting your MBA

This is not a company provided case.

Problem Statement:

- Your client is Igloo Jets a US airliner based in the Pacific Northwest. Traditionally serving as a connection between the mainland US and Alaska, Igloo Jets has slowly expanded to serve 104 different destinations including 2 international destinations and operates 150 Boeing 737 aircraft.
- Over the past 10 years, profitability has plateaued and we have been hired to develop methods to increase the bottom line.

Clarifying Questions (*Answer only if asked*):

- Goals: There are no specific profitability goals or timelines
- Revenues/Costs: Real revenues and costs have been constant over the past 10 years
- Operations: Igloo Jets has hubs in Portland (PDX), Seattle (SEA), and Anchorage (ANC), and a very small hub in Los Angeles (LAX). The hub at LAX has failed to gain the traction Igloo had forecasted. Flights offered by Igloo Jets focus on the West and Midwest of the US.
- Company: There have been no significant changes to internal operations. Igloo Jets has been rated as having the highest customer satisfaction for 8 years in a row
- Industry: There has been quite a bit of consolidation, with 4 competitors making up 85% of the market. Much of the increase in air travel is being driven in the major California airports (LAX, SFO).
- Customers: Typically leisure or low budget business travelers
- You should inform the candidate that Igloo Jets can be considered as a typical US budget airliner

Question 1: What are the important factors to consider when assessing this problem?

- Ideally this is a simple profitability framework. Candidates should drill down to determine what areas could be altered to improve profitability
- Good candidates will depart from a vanilla profitability framework by including industry specific terms and recent events/trends. Be thinking of terms like: fares, in-flight revenue, baggage/booking fees, leisure/business, revenue seat miles, leasing planes/engines.
- Great candidates will consider outside influences like government regulations, competitors, industry partnerships, etc.
- Keep testing creative candidates by saying “What else,” or “Keep thinking.”
- The next prompt covers variable costs, so drive the candidate to expand that branch of their structure
 - Profit
 - Price
 - By Seat Type
 - By Destination
 - Non-Core Services
 - Quantity
 - By Destination
 - By Plane Type
 - By Seat Type
 - Costs
 - Fixed
 - Equipment
 - Labor
 - Hangar space
 - Insurance
 - Non-Core Services
 - Variable
 - Fuel
 - Landing Fees
 - Catering
 - Maintenance

Question 2: Several executives at Igloo Jets are suggesting the airline should hedge their fuel prices. There are suppliers willing to supply fuel next year at today's prices. What factors should be considered when assessing this opportunity?

- Provide the candidate with Exhibit 1
- Hedging means a buyer purchases the right to buy fuel at a designated price at a later date for a specific price, regardless of what the price of the fuel may be at that date. Assume the hedging price is the current price of fuel. There is an additional cost to purchase the contract.
- The interviewee should move to determine the difference between the expected future spot price and the current spot price. Once this number is found, they should subtract the contract price. Guide them to a price per gallon calculation.
- After the interviewee finishes the math, ask them to explain their findings to the executives
- This is a unique concept. Help the interviewee set up the equation and guide them through the process. Check how well they can learn and utilize a new business concept.

Information to provide when asked:

- Igloo Jets paid \$950M for fuel this past year
- Each plane would burn 10M gallons of gasoline if run nonstop for a year
- Igloo Jets has a 33% plane utilization rate
- When the candidate asks about expected future fuel price, provide Exhibit 2

Solution:

Current Price

$$\frac{\text{Price}}{\text{Gallon}} = \frac{\text{Fuel Cost}}{\text{Total Gallons Consumed}} = \frac{\text{Fuel Cost}}{\# \text{ Planes} * \text{Gallons per year} * \text{Utilization}} = \frac{\$950M}{150 * 10M * \frac{1}{3}} = \frac{(\$9.5 * 10 * 10M)}{(3 * 5 * 10M) * 10M * \frac{1}{3}} = \frac{\$1.9}{\text{gallon}}$$

Cost of the Option

$$\begin{aligned} \text{Savings} &= (\Delta \text{Prices}) - \text{Cost of Contract} = (\text{Expected Future Price} - \text{Current Price}) - \text{Cost of Contract} \\ &= \left(\left(\left(\$1.50 + \frac{5}{50} \right) + \left(\$1.90 + \frac{10}{50} \right) + \left(\$2.00 + \frac{35}{50} \right) \right) - \frac{\$1.9}{\text{gallon}} \right) - \$0.05 = \left(\frac{\$1.93}{\text{gallon}} - \frac{\$1.90}{\text{gallon}} \right) - \frac{\$0.05}{\text{gallon}} = \frac{-\$0.02}{\text{gallon}} \end{aligned}$$

Question 3: Another team of consultants has been exploring potential acquisition targets for Igloo Jets. What characteristics would an ideal target demonstrate?

- The case has abruptly switched from exploring a specific cost savings to growing via an acquisition. Test how quickly the interviewee can shift gears to generate new ideas on a potential merger
- Keep the details fairly high level and make sure the interviewee is being comprehensive in their structure

Items to push the candidate to consider:

- | | |
|--|--|
| <ul style="list-style-type: none">• Corporate<ul style="list-style-type: none">• Headquarters Location• Company Culture• Profitability<ul style="list-style-type: none">• Revenue/Cost Breakdown• Financial Standing<ul style="list-style-type: none">• Capital Structure• Credit Rating | <ul style="list-style-type: none">• Operations<ul style="list-style-type: none">• Fleet makeup and age• Destinations Served• Hub locations• Customers<ul style="list-style-type: none">• Demographic Served• Customer Base Growth• Reputation |
|--|--|
- Again, treat this as a very high level acquisition question testing the candidate on whether they are thinking of adding value to the company at the lowest cost and with minimal integration efforts.
 - Once they finish structuring, hand them Exhibit 3 and ask them to use their reasoning to select the best target. Guide the candidate to select Eccentric English based on size, fleet makeup, destinations and customers

Question 4: How much per share would Igloo Jets be willing to pay to acquire Eccentric English?

- Provide Exhibit 4
- Guide the candidate through a DCF with considering the FCFs as a perpetuity
- The candidate should synthesize a recommendation based on their calculated values and the Eccentric English market cap
- A great candidate would realize that the calculated value is a 30% premium on the current market cap

Solution:

$$\text{NOPAT} = \text{EBIT} * (1 - \tau)$$

$$= \$250M * (1 - 0.3) = \$175M$$

$$\text{FCF} = \text{NOPAT} + \text{Annual Depreciation} - \text{Annual Capex and } \Delta\text{NWC}$$

$$= \$175M + \$20M - \$35M = \$160M$$

$$\text{NPV(FCF)} = \frac{\text{FCF}}{\text{wacc} - \text{growth}} = \frac{\$160M}{12\% - 2\%} = \$1.60B$$

$$\text{NPV(Operations)} = \text{NPV(FCF)} - \text{Integration Costs} = \$1.60B - \$40M = \$1.56B$$

Extra Efforts:

$$\# \text{ Eccentric English Shares} = \frac{\text{Market Cap}}{\text{Price Per Share}} = \frac{\$1.2B}{\$40} = 30M$$

$$\text{Max Price per Share} = \frac{\text{NPV(FCF)}}{\# \text{ Shares}} = \frac{\$1.56B}{30M} = \$52$$

Recommendation:

- The candidate should offer a concise recommendation to acquire Eccentric English with some of the following reasoning
 - Acquisition would allow Igloo Jets to have access to more gates in California and also to shore up its underperforming LAX hub.
 - Operations of the two companies blend well together
 - The fleet makeup is similar which should aid maintenance and operations, yielding some positive synergies
 - The target customer and travel destinations are similar
 - Comparing the projected financials versus the acquisition cost yields a positive NPV if negotiations yield a PPS of less than \$52.
- Good candidates will offer next steps hinting at:
 - Identifying more revenue/cost synergies
 - Reducing integration costs
 - Negotiating acquisition price
- Including information about efforts related to the fuel hedging is irrelevant and detrimental to the recommendation. Advise the candidate afterwards to synthesize facts supporting their recommendation.

Exhibit 1: Igloo Jets Fuel Related Information

Table 1: Hedging Financials

FY 2015 Fuel Cost	\$950M
Hedging Amount	100%
Unitized Hedge Contract Cost	\$0.05 per gallon

Table 2: 737 Data

737 Yearly Maximum Fuel Burn	10M gallons
Igloo Jets 737 Utilization	33%

Exhibit 2: Future Fuel Price Forecasts

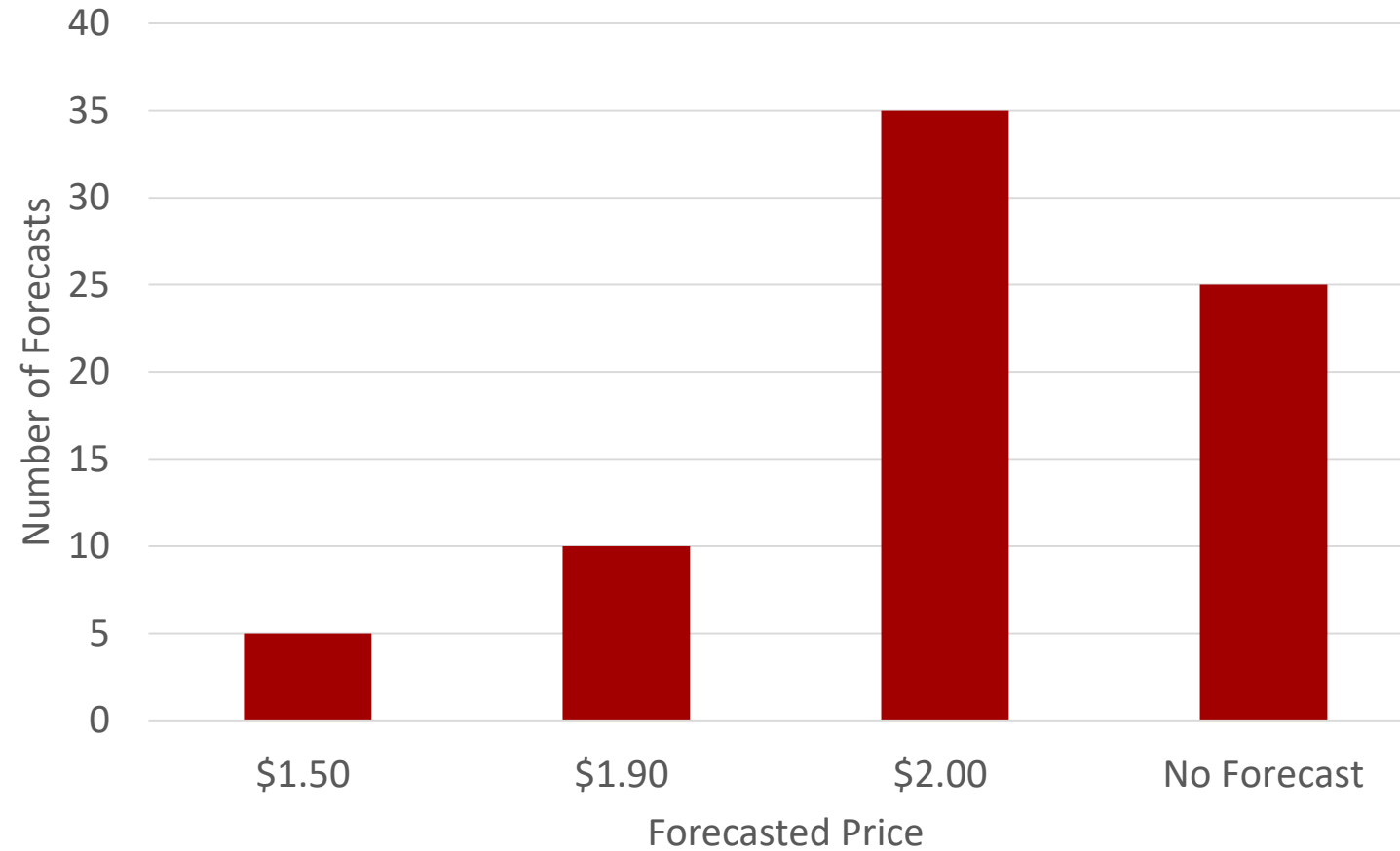


Exhibit 3: Potential Acquisition Targets

Company	America Efficient	Aloha Fliers	Azteca Air	Eccentric English	Blue Planes
Target Customer	Budget Leisure/Business	Leisure	International	Budget Leisure/Business	Budget Leisure/Business
Number of Planes	700	50	125	60	220
Fleet Makeup	Boeing 737	Airbus 330 x 20 Boeing 717 x 20 Boeing 767 x 10	Boeing 737 x 85 Embraer 190 x 40	Boeing 737	Airbus 320 x 130 Embraer 190 x 90
Destinations	Continental US, Mexico, Canada	Hawaii and US West	US Southwest and Mexico	US West, Southwest, and Mexico	Continental US
Major Hubs - No. Gates	MDW - 250 BWI - 220 LAS - 220 DEN - 200	HNL - 15	ABQ - 15 MEX - 25	LAX - 20 SFO - 20	FLL - 90 BOS - 124 JFK - 150
Market Cap	\$30B	\$2.5B	\$30B	\$1.2B	\$6B
PPS	\$45.0	\$50.0	\$40.0	\$40.0	\$20.0

Exhibit 4: Acquisition Details

Additional EBIT	\$250M
Effective Tax Rate	30%
NOPAT	
Annual Depreciation	\$20M
Annual Capex and ΔNWC	\$35M
Free Cash Flow	
WACC	12%
Projected Growth	2%
NPV(Free Cash Flow)	
Integration Costs	\$40M
NPV(Operations)	

Written by: Geoffrey Ensby (Class of 2016)

Case Type: Market Entry

Case Basics

Delivery:	Command & Control
Company:	McKinsey & Co.
Industry:	Financial Services
Concept:	Product Introduction
Difficulty Level:	Medium
Quants:	Medium
Strategic Thinking:	Medium

Note to the Interviewer:

- The case is a fairly straightforward market entry decision about whether to introduce a new product
- The key aspects are market sizing based on the data provided and drawing insights from the charts
- Structuring throughout, whether with equations and tables or trees will help solve the problem
- Rephrase the prompt at the end of the case to demonstrate that this is analogous to other industries and does not require specific knowledge

Fit Interview Questions:

- How would you change your MBA program?
- Discuss a time when you stood your ground.
- Discuss in an instance when you faced controversy.

This is not a company provided case.

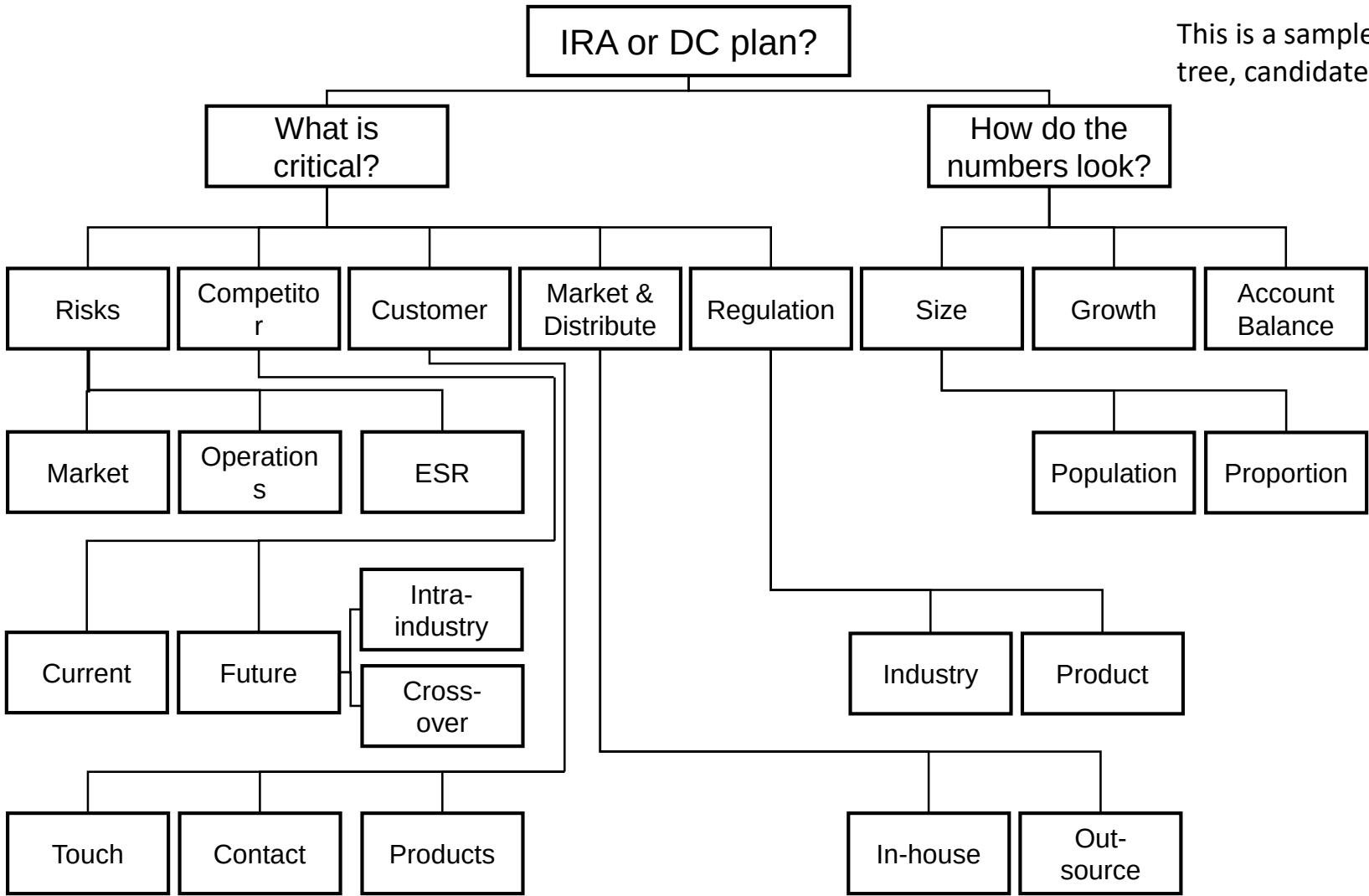
Problem Statement:

- Your client is a large international asset management firm that is looking to enter the market for retirement plans
- The decision is between providing IRAs or DC plans
- Today, both markets are about the same size, at ~\$3T, and generate the same fees
- ***The client is interested in determining which to enter, based on the five-year growth outlook for each market***

Clarifying Questions (Answer only if asked):

- The growth rates are different
- The fees are 75bps per annum (\$75 per \$10,000 managed)
- Both markets have few barriers to entry and exit
- The competition is other focused asset management firms as well as insurance companies and universal banks
- The market is solely in the US
- Regulatory concerns do not discriminate between offerings
- The year now is 2005; The decision point is for 2010
- An IRA is an Individual Retirement Account
- A DC is a Defined Contribution Plan

Question 1: What are important factors to consider when assessing this problem?



This is a sample market entry tree, candidates may differ.

Question 2: What is the market potential for each product?

(Provide Exhibits A, B, & C [*Handouts 1, 2, & 3*])

Age Group	2005 Pop	%Growth	#Growth	2010 Pop
35-54	70M	-5%	-3.5M	66.5M
55-74	50M	+20%	+10M	60M
75+	20M	+5%	+1M	21M

Age Group	DC Plan Acct Bal	IRA Acct Bal
	<i>Acct Bal = Avg Bal Sz * Population</i>	
35-54	\$30K * 66.5M = \$2.0T	\$34K * 66.5M = \$2.2T
55-74	\$20K * 60M = \$1.2T	\$26K * 60M = \$1.55T
75+	\$0K * 21M = \$0T	\$0K * 21M = \$0T
Mkt Sz	\$3.2T	\$3.75T

- The IRA represent the best opportunity, growing from about \$3T in size today to \$3.75T, a 25% increase, due to larger account balances
- In contrast, the DC plan grows less than 10%, from \$3T now to a projected \$3.2T, a 7% rise



Question 3: If each offering is managed for a fee of 75bps, and assuming 10% market share, which option is more lucrative? How much more would have to be charged for the DC plan to make revenue equivalent? Is this a sound idea?

Note: bps stands for basis points and 1bps is equal to 0.01%

- Clearly the IRA is most lucrative, given that it has a larger base
 - DC plan revenue = Base * Fee * Mkt shr = $\$3.2T * 10\% * 75bps \rightarrow 0.75\% = \$2.4B$
 - IRA revenue = Base * Fee * Mkt shr = $\$3.75T * 10\% * 75bps \rightarrow 0.75\% = \$2.8B$
- The DC plan would have to charge 15% more, or about 85bps, to be comparable on revenue terms
- This is not a sound idea, unless the DC plan can provide greater services that are also sought by customers, as otherwise money is being managed through index products with minimal distinction and thus limited incentive to justify greater costs



Question 4: Our client is concerned about competing with discount brokerages. Should they be concerned about this within the IRA product space?

(Provide Exhibit D [**Handout 4**])

Insights From Handout 4:

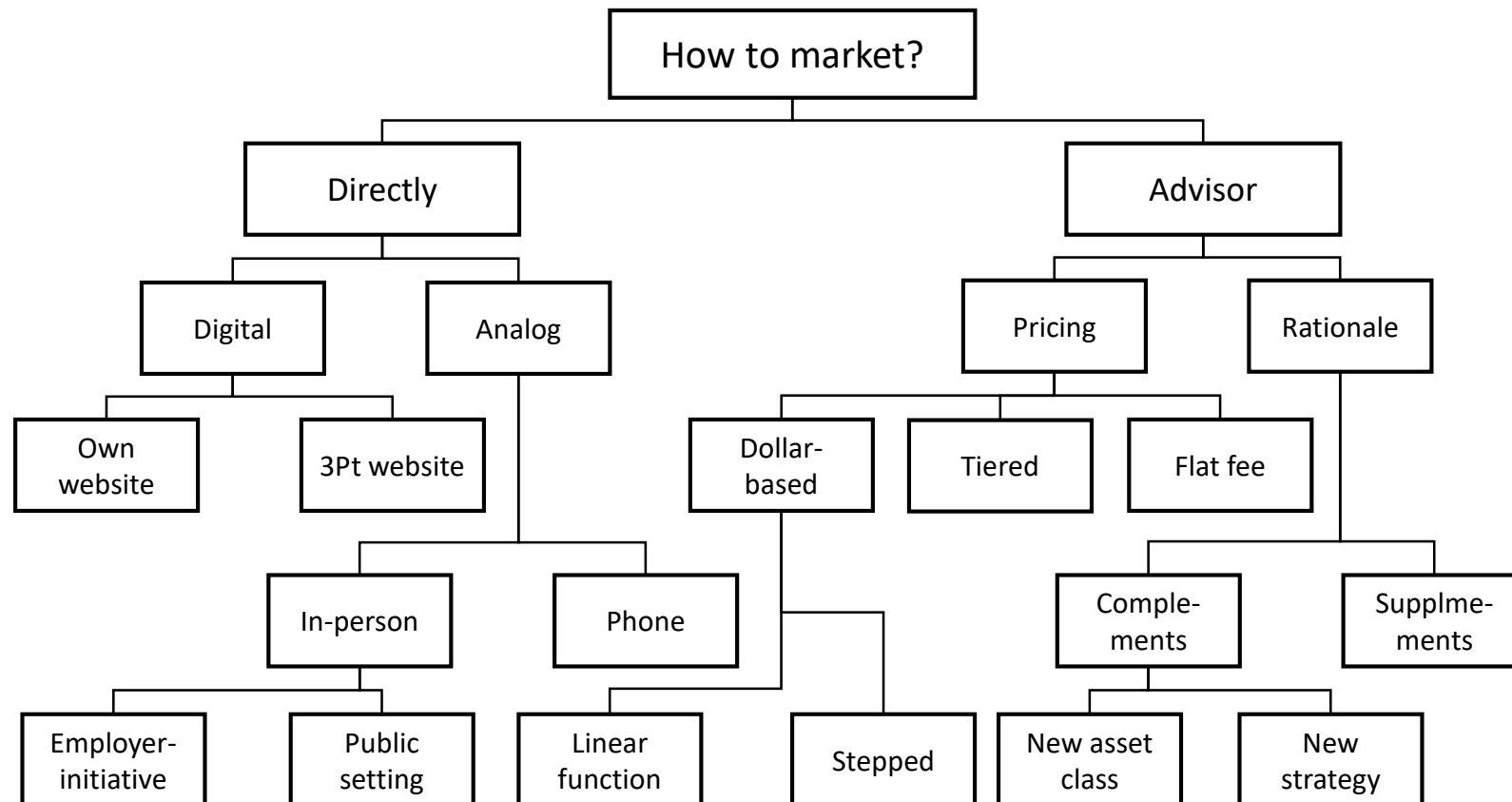
- Consumers want high-touch offering
- Prefer many products across range of asset classes, regions, size, and strategies
- Seek advice and guidance that can be provided

Our client should not be concerned about discount brokerages.

- Customers not overly price-sensitive
- Website and 1-800 number (low cost/touch customer service methods) not sought since customers prefer personal service and advice
- May not be as capable on other dimensions, including options for offerings

Question 5: What is the best way to market this product?

- Can directly contact consumers, though may not be appropriate given survey results
- Can work through advisors, as many asset managers do when selling IRAs
- **Note:** strong candidates will structure their response instead of just listing 2 or 3 ideas





Question 6: What are some associated risks with launching an IRA product?

- Market
 - New entrant arrives with lower fees
 - New entrant provides better service
 - New entrants combines lower fees with better service
 - Customer preferences dramatically shift
- Operational
 - Can't provide service up to specs
 - Can't offer as many products as sought
 - Can't keep costs controlled in process of achieving first two objectives such that no longer competitive
- ESG – (Environmental, Social, Governmental)
 - Capital markets collapse
 - Scandals in finance
 - Industry standards
 - Government regulation

RECOMMENDATION

Go forward with the IRA offering

Rationale:

- Larger market, at \$3.75T, and faster growing
- Consumers prefer offerings
- Can charge more as provide significant service

Risks:

- Preferences change
- Another player enters with lower fees
- A discount brokerage cuts costs enough to trigger move

Going Forward:

- Launch marketing campaign
- Engage in product relationships
- Find ways for cost cuts to remain competitive
- Consider additional more service offerings for greater value

Exhibit A: Handout 1

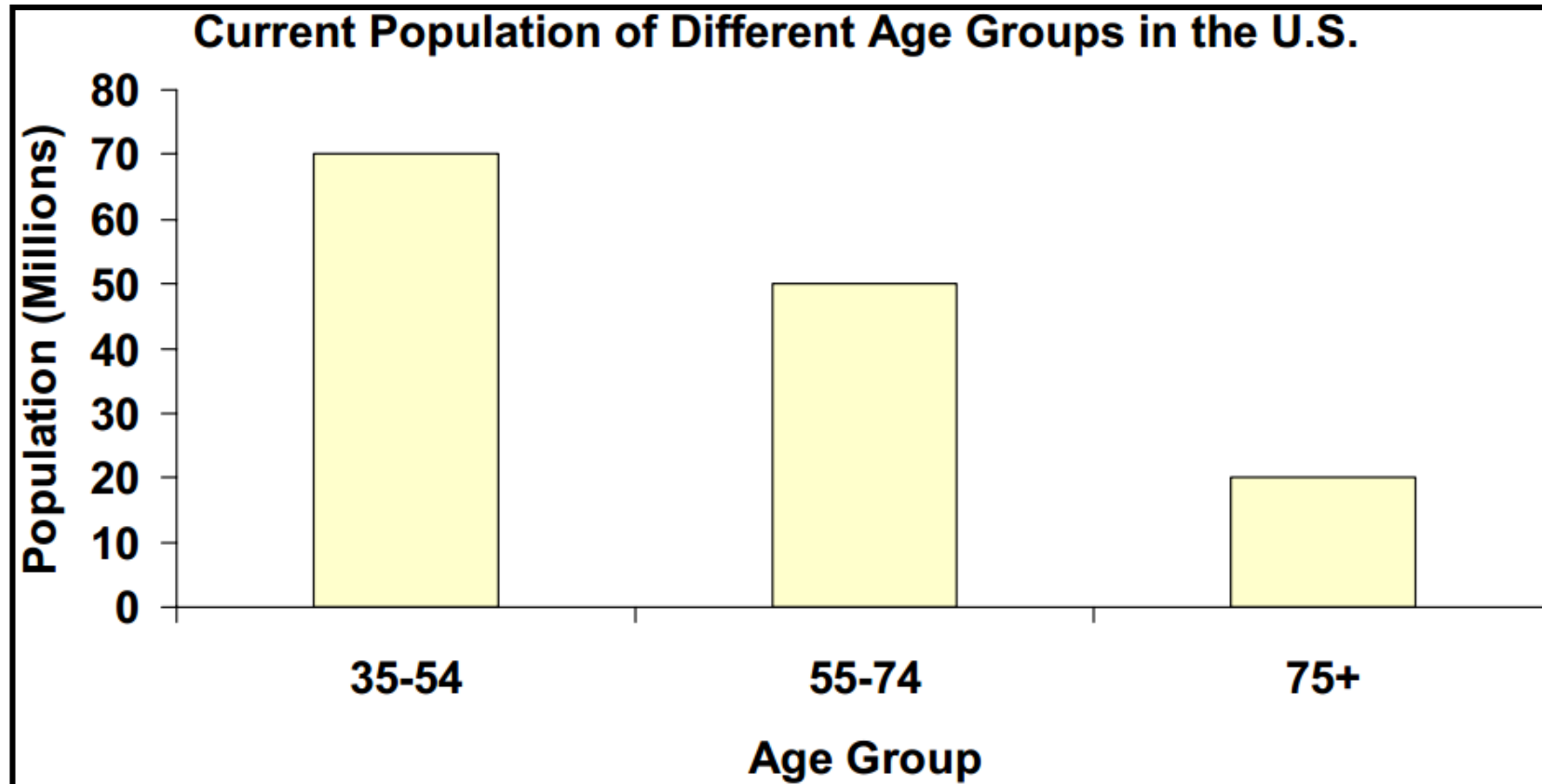




Exhibit B: Handout 2

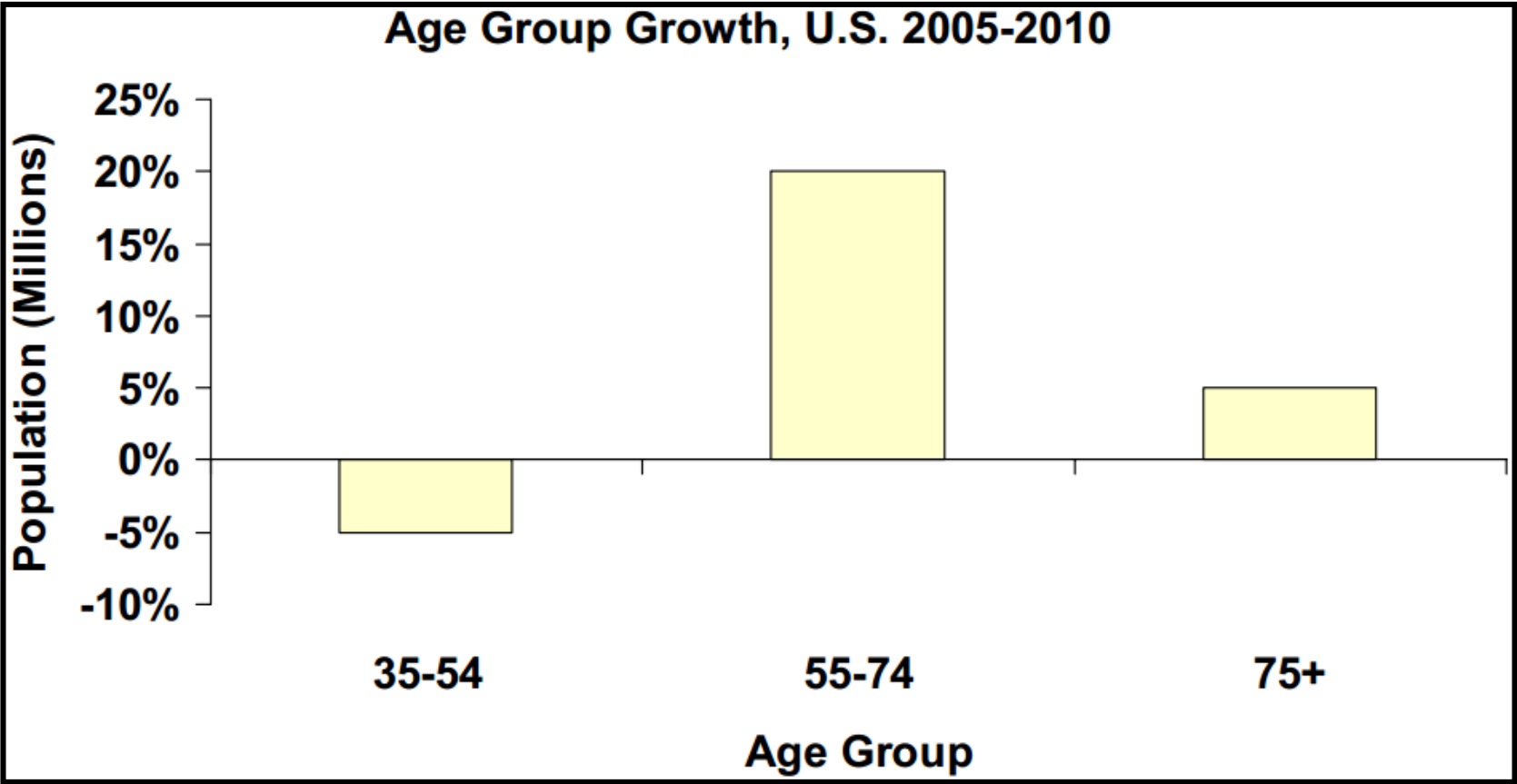




Exhibit C: Handout 3

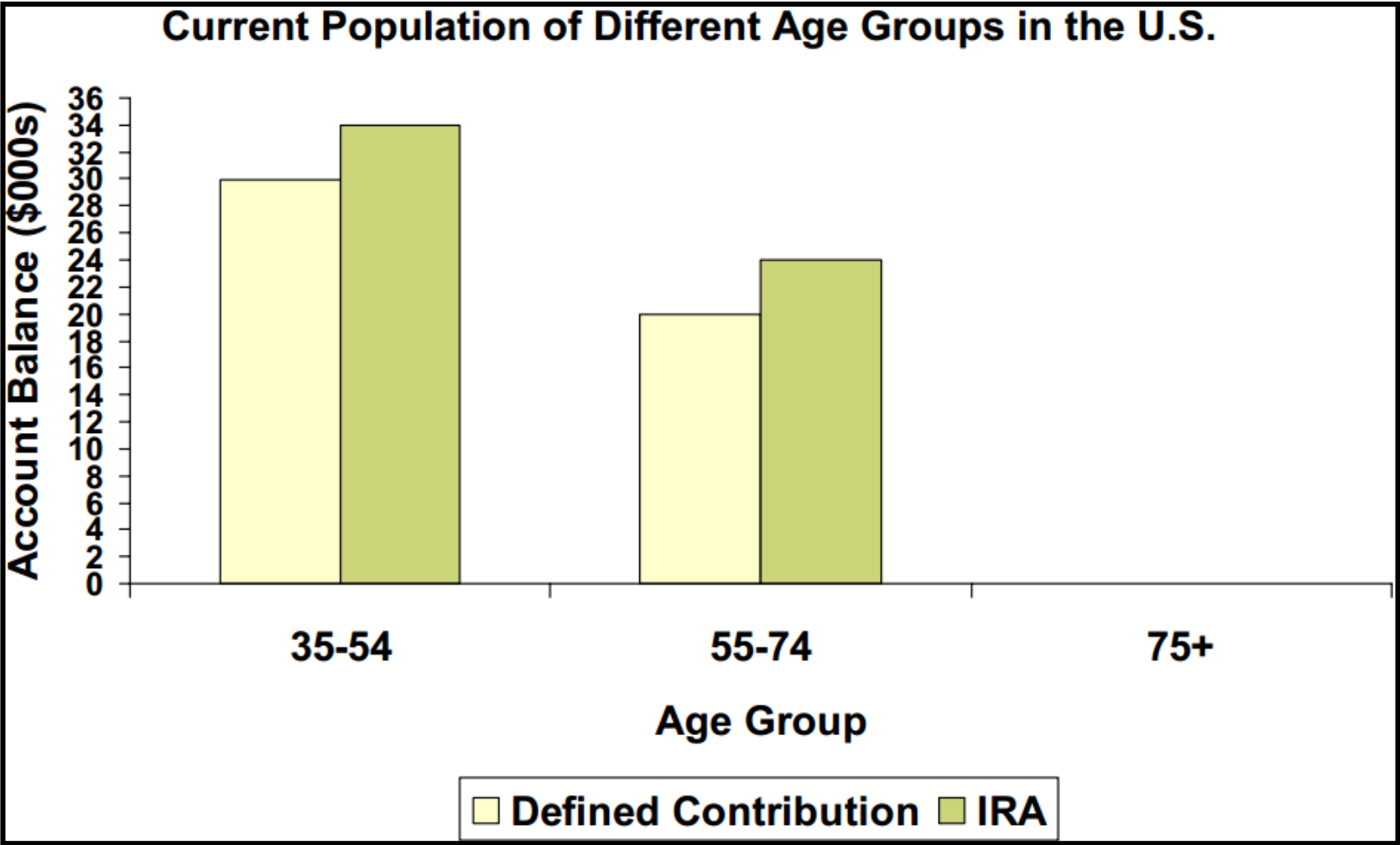
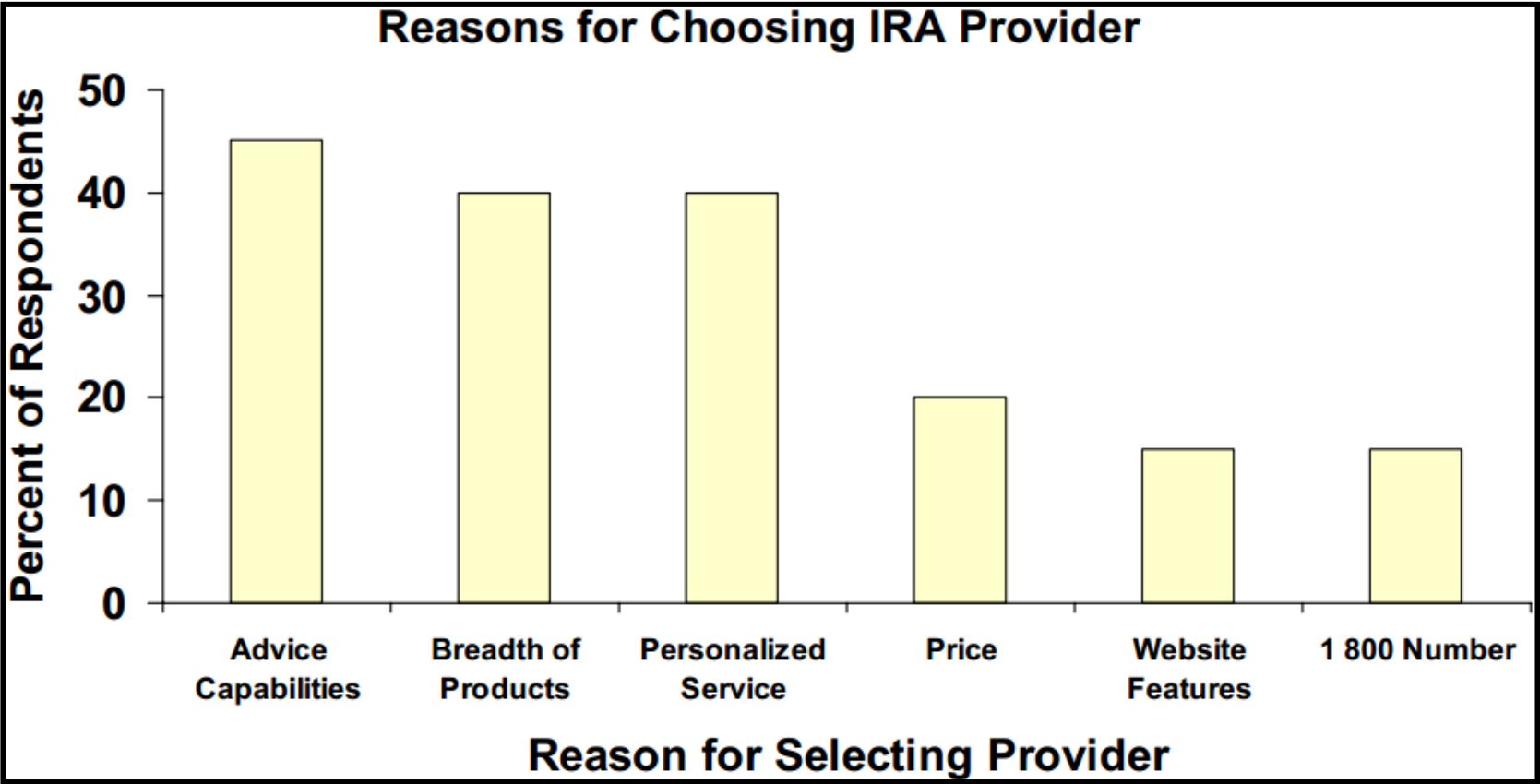




Exhibit D: Handout 4



Written by: Munir Parikh (Class of 2016)

Case Type: Profitability

Case Basics

Delivery:	Command & Control
Company:	McKinsey & Co.
Industry:	Manufacturing
Concept:	Profitability
Difficulty Level:	Medium
Quants:	Medium
Strategic Thinking:	Hard

Note to the Interviewer:

- The candidate may not be able to get to the right conclusion considering that this is a relatively uncommon industry segment. The interviewer will have to nudge the candidate in the right direction.
- The case requires intense analytical and strategic thinking abilities.
- The candidates should not be given any information unless asked for or if it is absolutely necessary to nudge her in the right direction.

Fit Interview Questions:

- Tell me about a time when you had a disagreement with your supervisor.
- What was your biggest mistake? What did you learn from it?
- How do you keep abreast of the current events?

Adapted from Bloomberg Article Dated 5/27/15: "Your Salad Lunches Are Killing American Leather"
<http://www.bloomberg.com/news/features/2015-05-27/your-salad-lunches-are-killing-american-leather>

This is not a company provided case.

Problem Statement:

- Our client, Rockfield Leather is the leader in the leather shoelace industry. Rockfield manufactures shoelaces from the cowhides received from the farmers. Today, Rockfield employs 115 workers in two locations and subcontracts about a third of its cutting business to a factory in China.
- Rockfield experienced a steady sales growth and healthy profit margins from 2004 to 2012. However, since 2013 the firm has seen a sharp decline in its profit margin.
- Our client has hired our firm to determine the reasons for the profitability decline and recommend a solution.

Clarifying Questions:

- **What is the manufacturing process?:** Hand the candidate Exhibit 1. A strong candidate will quickly look at it for three major steps: Tanning, Dyeing and Cutting without going into detail. The candidate should conclude that she will come back to the details later if there is a need to analyze the process for efficiency improvement.
- **Who are the customers?:** This is a B2B company. Major customers are mid-market leather shoemakers such as Ugg, Sperry Top-Sider, L.L.Bean and Timberland. Customers in this segment are price sensitive. (i.e. raising prices is not an option.)
- **What is the industry / competitive landscape?:** Rockfield is the only major US based leather shoelace manufacturing company. The global market is fragmented and most of the production occurs in China. (i.e. quality differentiation is not possible in this industry).
- **What were the revenue and profit in 2014?:** Revenue in 2014 was \$89M and margin was 15%.
- **What was the historical performance?:** We only have 2012 information. Revenue was \$90M and margin was 30%.
- **Do we have any specific financial goals?:** No. We want to focus on reasons for the profit decline and recommend a solution.

Question 1: What do you think could be the primary reasons for the profitability decline?

- The candidate should draw a profitability structure with revenue and cost.
 - Revenue is price times quantity.
 - A candidate can address Cost in two ways. Either variable and fixed or value chain.
- A strong candidate will build a hypothesis that it is a cost issue considering that revenue decline is significantly smaller than the decline in profit margin. She should deep dive into the cost with different drivers specific to the company and industry based on the information provided.
- **Fixed Cost / Variable Cost Analysis:**
 - Fixed costs: SG&A, D&A and Supervisory Labor Costs. These costs cannot be the main driver for the 50% decline in the margin. A strong candidate should discount these and move on to analyze the variable costs.
 - Variable costs: Material, Direct Labor, Utilities, Insurance, Freight. A strong candidate will build a hypothesis at this point that the material costs should be the main driver for a significant cost increase leading to a sharp decline in profit margin.

- **Value Chain Analysis:**



- A strong candidate will build a hypothesis at this point that the material costs should be the main driver for a significant cost increase leading to a sharp decline in profit margin. Other drivers could not have increased substantially in two years, knowing the economy's performance in general in 2013 and 2014.
- **If the candidate does not build this hypothesis, precede the next question with “We have concluded that the in-bound material (cowhides) costs have increased substantially...”**

Question 2: Now I want you to look the Exhibit 2 and determine how much the cost to produce a shoelace has increased in 2014 compared with 2012.

Answer Key

	Weight	2012	2012	2014	2014
Cow	1,300	\$1.40 per lb	\$1,820	\$1.50 per lb	\$1,950
Carcass (Raw meet)	800	\$2.20 per lb	\$1,760	\$2.25 per lb	\$1,800
Inedible body parts	450	\$0.00 per lb	\$0	\$0.00 per lb	\$0
Skin	50 (not needed)	\$ ____ each	\$60	\$ ____ each	\$150
Tanning		\$19 / skin	\$19	\$19 / skin	\$19
Dyeing		\$38 / skin	\$38	\$38 / skin	\$38
Cutting		\$15 / hide	\$15	\$13 / hide	\$13
Cost per hide			\$132		\$220
Cost per lace		(\$132/550)	\$0.24	(\$220/550)	\$0.40

Increase in price per lace: $(0.40 - 0.24) / 0.24 \rightarrow 0.16 / 0.24 \rightarrow 66.7\%$

Synthesis: Cow price has increased substantially and has caused an increase in price of hide. Note the client has attempted to cut the manufacturing costs, as the cost of the cutting process has reduced from \$15/hide to \$13/hide.

Question 3: What do you think could be some of the reasons why the price of the cowhide increased this much in two years?

- **The interviewer should test the candidate's microeconomics concepts and strategic thinking here.**
 - A strong candidate will build upon the information provided in question 2. Price of the carcass has increased relatively less than the price of cow. The price increase of cow is clearly passed on to the skin.
- **Ask the candidates why she/he thinks that the majority of the price increase is being passed on to the skin and not the meat?**
 - This question challenges the candidate to use the microeconomics concepts, and tests her strategic thinking and analytical skills.
 - Beef demand has reduced substantially in last two years, resulting in lower demand for farmers to breed cows. This has resulted in reduced supply of cows and thus cowhides. However, leather demand has held steady. Therefore price of the cowhide has increased sharply.
(*Extra knowledge: Beef demand has reduced due to changes in consumers' consumption patterns. People eat more lean and white meat, and salads than beef.*)
 - A creative candidate can also come up with other reasons such as drought and widespread animal diseases in certain parts of the country affecting the cow supply.

Question 4: What are some of the ways the client can improve the margins from the current levels of 15%?

- **The interviewer should test the candidate's creativity and strategy thinking here.**
 - A weak candidate will try to find ways the client can reduce the in-sourcing price of the hide. The fact that cow prices are dictated by beef demand and the cows being a commodity means that the client doesn't have any ability to reduce the in-sourcing material price.
 - A strong candidate will prepare a MECE analysis to evaluate all options before zeroing on the most suitable and attractive option.
 - Price: Can the price be increased? No. The customer is price sensitive. The fragmented market does not allow product differentiation to justify a price increase.
 - Sell to high end customers such as Coach, Prada and Fossil: Changing the product placement from midmarket to upmarket. The higher end shoes market size is fairly small. Even if Rockfield makes any gains by attempting to this market, it will cannibalize the demand mid-market segment. However, this option requires further analysis.
 - Change the cutting process, if possible to make more than 550 shoelaces. This will reduce thickness of the shoelaces. This is a viable option; however, Rockfield will need to reach an agreement with the existing customers on this solution without reducing the prices.
 - Does Rockfield have any scrap material? Can they use the scrap material to make alternative products?
(Extra knowledge: The company implemented the last two solutions. Rockfield turned scrap material into shoulder straps for women's handbags. Ralph Lauren uses these straps in its handbags.)

Question 5: Pretend I am the CEO. What would recommend to her?

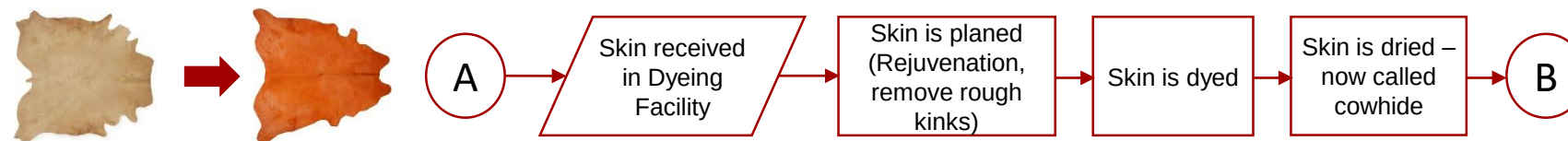
- **Situation → Problem Synthesis → Recommended Solution → Next Steps**

Exhibit 1: Manufacturing Process

Phase 1: Cow to tanned skin in Tannery (Contracted out)



Phase 2: Skin dying (Franklin, TN)



Phase 3: Cutting (Rockfield, TN 65%, China 35%)

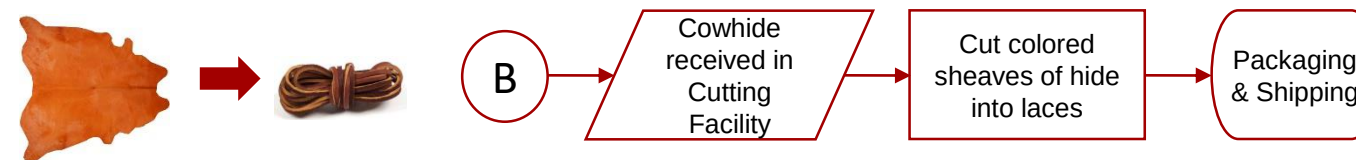


Exhibit 2: Shoelace Production Financial Data

	Weight (in lbs)	2012	2014
Cow	1,300	\$1.40 per lb	\$1.50 per lb
Carcass (raw meat)	800	\$2.20 per lb	\$2.25 per lb
Inedible body parts	450	\$0.00 per lb	\$0.00 per lb
Skin		\$ ____ each	\$ ____ each
Tanning		\$19 / skin	\$19 / skin
Dyeing		\$38 / skin	\$38 / skin
Cutting		\$13 / hide	\$13 / hide
Each cowhide makes 550 shoelaces			



Written by: Geoffrey Ensby (Class of 2016)

Case Type: PE Investment

Case Basics	
Delivery:	Command & Control
Company:	McKinsey & Co.
Industry:	Healthcare
Concept:	Go / No-Go
Difficulty Level:	Medium
Quants:	Medium
Strategic Thinking:	Hard

Note to the Interviewer:
• This is a basic investment go / no-go decision based on specific IRR criteria • The PE aspect requires additional analysis • Industry knowledge is not necessary • Structuring throughout, with tables, equations, and trees, will help to understand the problem

Fit Interview Questions:
• What did you consider for other undergraduate majors? • When was a time that you had to think on your feet? • How have you solved a problem with inadequate resources?

This is not a company provided case.

Problem Statement:

- Your client is Greystone Partners, a US-based PE firm, which is raising a new fund, GP Fund IV
- The focus of GP Fund IV is on medical devices.
- Our client is considering acquiring Deluxe Cane, a leading maker of walking canes
- ***Should the acquisition be made?***

Clarifying Questions (Answer only if asked):

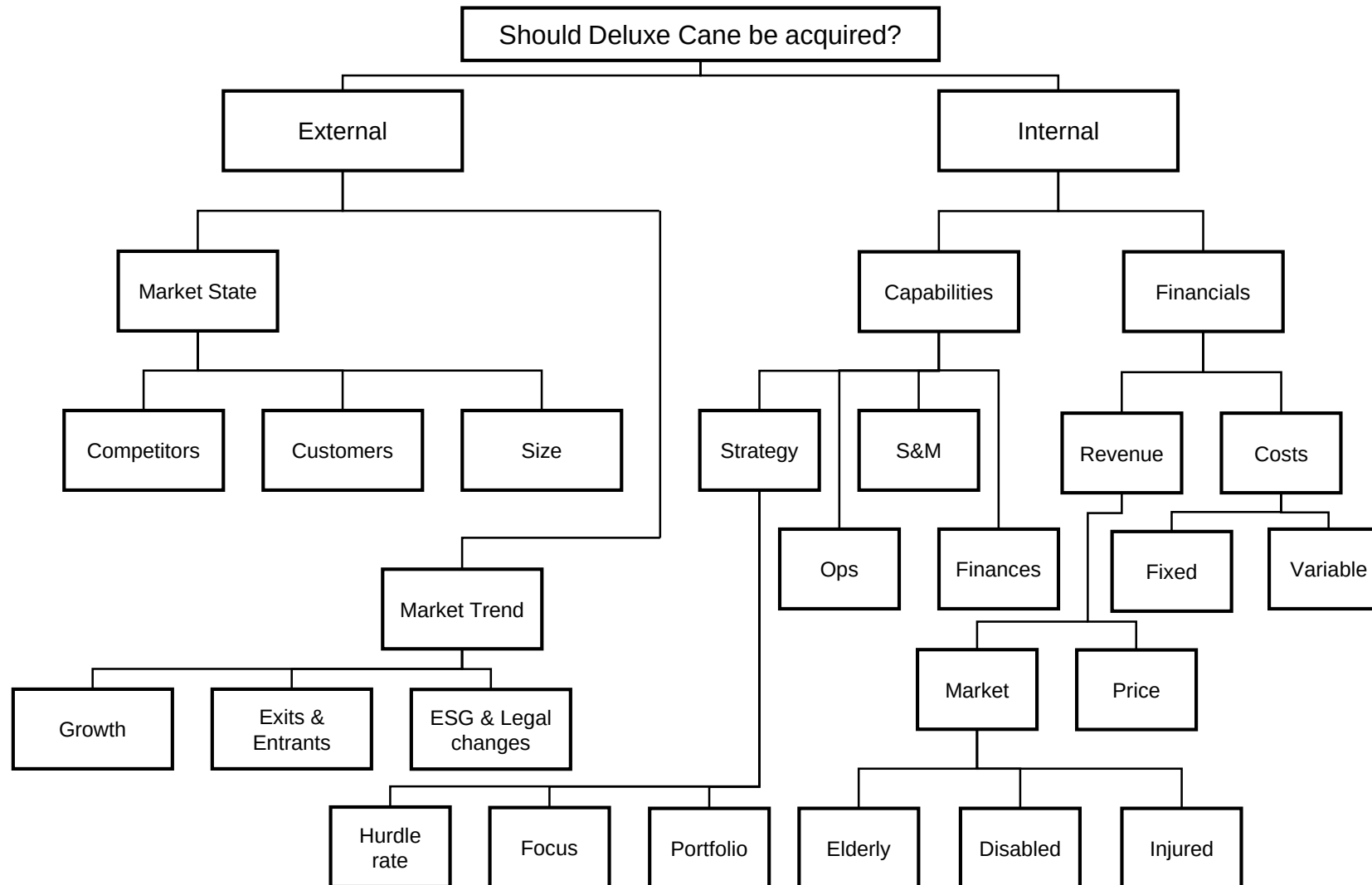
Greystone Partners

- Greystone has a hurdle rate of 20%
- Greystone has previously invested in medical device companies

Deluxe Cane

- The firm only makes one product
- Medicare is the primary payer; Health insurers (private for some elderly as well as disabled and injured) are the secondary payer
- There is no price discrimination between customers
- There are two other competitors
- The firm only sells in the US
- In addition to the elderly, disabled and injured individuals buy the cane
- This is a normal walking cane; there are no special features, and can be considered a commodity
- Cost structure:
 - Fixed: SG&A
 - Variable: Material, Variable manufacturing overhead, Labor, Shipping, Sales commissions

Question 1: What are important factors to consider when assessing this problem?



Question 2: What is the market size for walking canes in the US? Is it attractive?

(This is one way to market size; other approaches are acceptable [such as starting with a US population of 320M] so long as the assumptions are reasonable and calculations clear)

- Total population = 300M
- Share of elderly = $(1/5) * 300M = 60M$
 - Max age in US is 80yrs
 - Assuming that equally distributed into 5 segments of 15yrs each
- Share of elderly that needs canes is 40%; 24M canes in population
- Cane has average life of 5yrs; **~5M canes sold per year**
- If asked provide that **the average price of a cane is \$100**
- **Thus the market is ~ 500 Million dollars.**
- **Note: If the candidate doesn't get to a \$500M market size provide it to them, as it will be used in part 3.**

Excellent Candidates may consider the growth of this market:

- Growth rate for US population is 3% per year; Aging boosts this segment to 5%, so doubles every 14yrs or so (Rule of 72, with $72 / 5 \approx 14$)

Question 3: Describe the financial performance of Deluxe Cane. Given that both of the competitors operate as part of larger organizations, how does that affect your assessment of Deluxe Cane?

(Provide Exhibit A [**Handout 1**]; focus on left-side for now, All calcs assume Mkt Size =500M)

	Deluxe Cane	Competitor 1	Competitor 2
Sales	\$180M	\$165M	\$155M
Gross margin	15%	28%	29%
Production costs	\$153M	\$118.8M	\$110M
Gross profit	\$27M	\$46.2M	\$45M
Operating margin	9%	15%	16%
SG&A spend	\$13M	\$21.5M	\$20.2M
Operating profit	\$14M	\$24.75M	\$24.8M

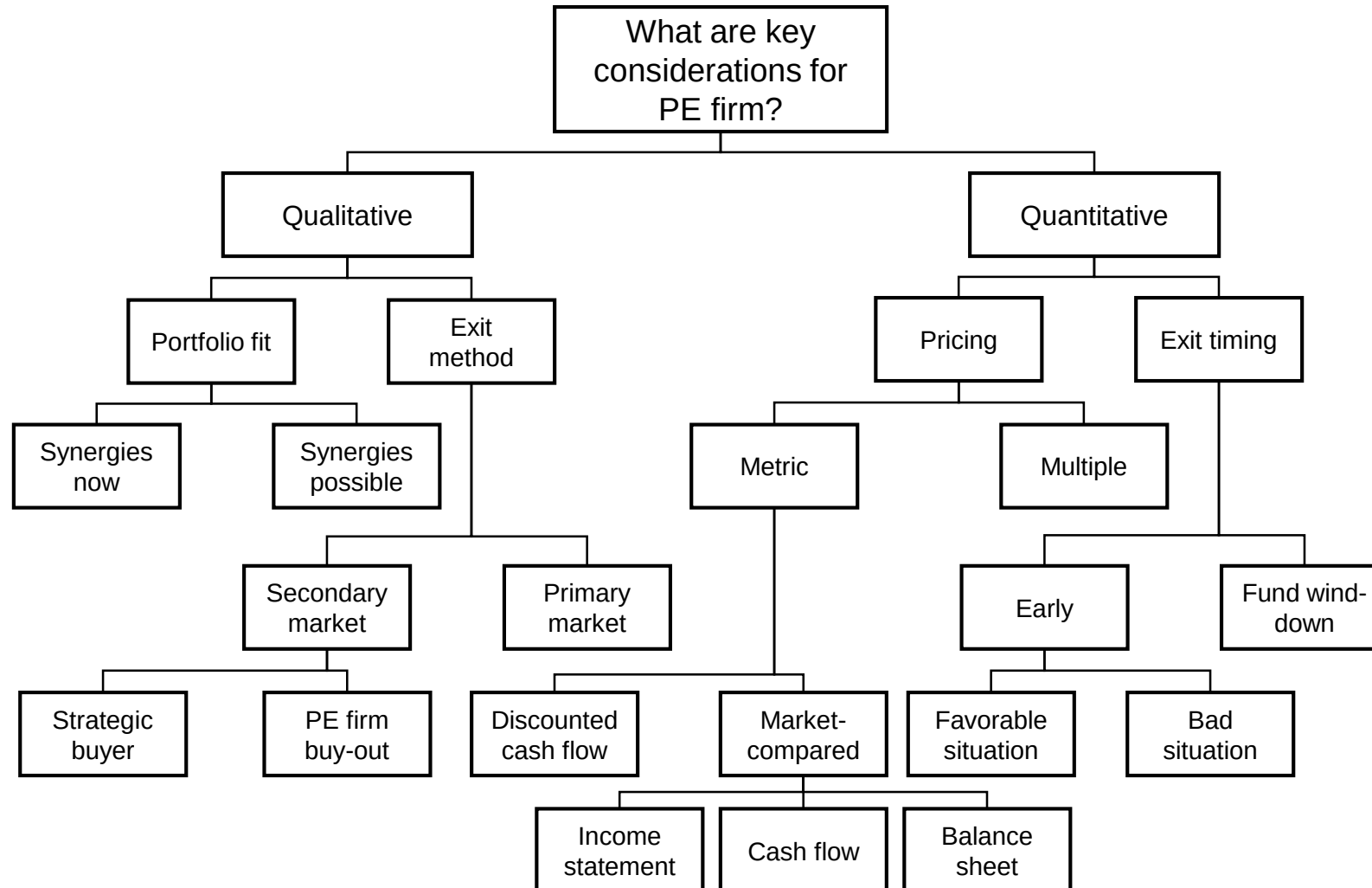
- Deluxe Cane has much higher production costs, yet because it is a commodity the features do not justify as cannot attain a higher price point
- The competitors are relatively similar, so that indicates both commoditization and best-practices manufacturing, in addition to benefit of economies of scale and scope from being part of larger organizations
- The SG&A spend is already low, so hard to cut more (whereas competitors facing challenge of carrying expenses for other divisions, perhaps)
- Why the difference in COGS? Buyer power, Economies of scale & scope

Question 4: Describe the 5yr performance of the three firms in this space

*(Retain Exhibit A [**Handout 1**]; emphasize linking right-side now to left-side)*

- 2006 metric given in USD
- Market share has declined for Deluxe Cane, by 20%. From the left hand side, the candidate should be able to **infer that Deluxe can has higher prices** than its competitors (36% in Rev Share vs 32% in volume share)
- From there the candidate should realize that the higher price point is not rewarded, which is consistent with canes being a commodity product.
- Competitor 1 has seen a 10% increase in market share
- Competitor 2 has experienced nearly a 25% rise in share
- The discrepancy is due to the lower price for the latter compared to the former, and explained by the commoditization of this product

Question 5: What are some key considerations for the PE firm?



Question 6: Can Greystone achieve its hurdle rate? IE, what would be the required leverage? Given that markets are tightening credit, is this attainable?

- Hurdle rate = 20%
- Operating margin = 9%
- NOPAT = Operating margin * (1 – Tax rate) = 9% * (1 – 40%) = 5.4%
 - Uses NOPAT as metric
 - 40% tax rate assumed
- The amount of leverage used by a firm correlates directly to its debt rating. The following are the leverage levels that correspond to following debt ratings:
 - BBB = 2x
 - BB = 3x
 - B = 4x
 - CCC = 5x
- **Market will only bear BB debt**; Regulators prohibit more than 6x
- Thus, **cannot attain hurdle rate with minimum debt rating-required leverage level of 3x** ($3 * 5.4\% = 16.2\%$)

RECOMMENDATION

Do not go forward with the acquisition

Rationale:

- Buyer power- Medicare, Private health insurers
- SG&A costs already very low
- High manufacturing costs that are not justified by product
- Higher pricing than competitors for commodity
- Market growth moderate
- Cannot lever enough to attain hurdle rate
- Losing market share in stable market
- Cannot benefit from portfolio effect as readily
- Other segments also suffer from buyer power

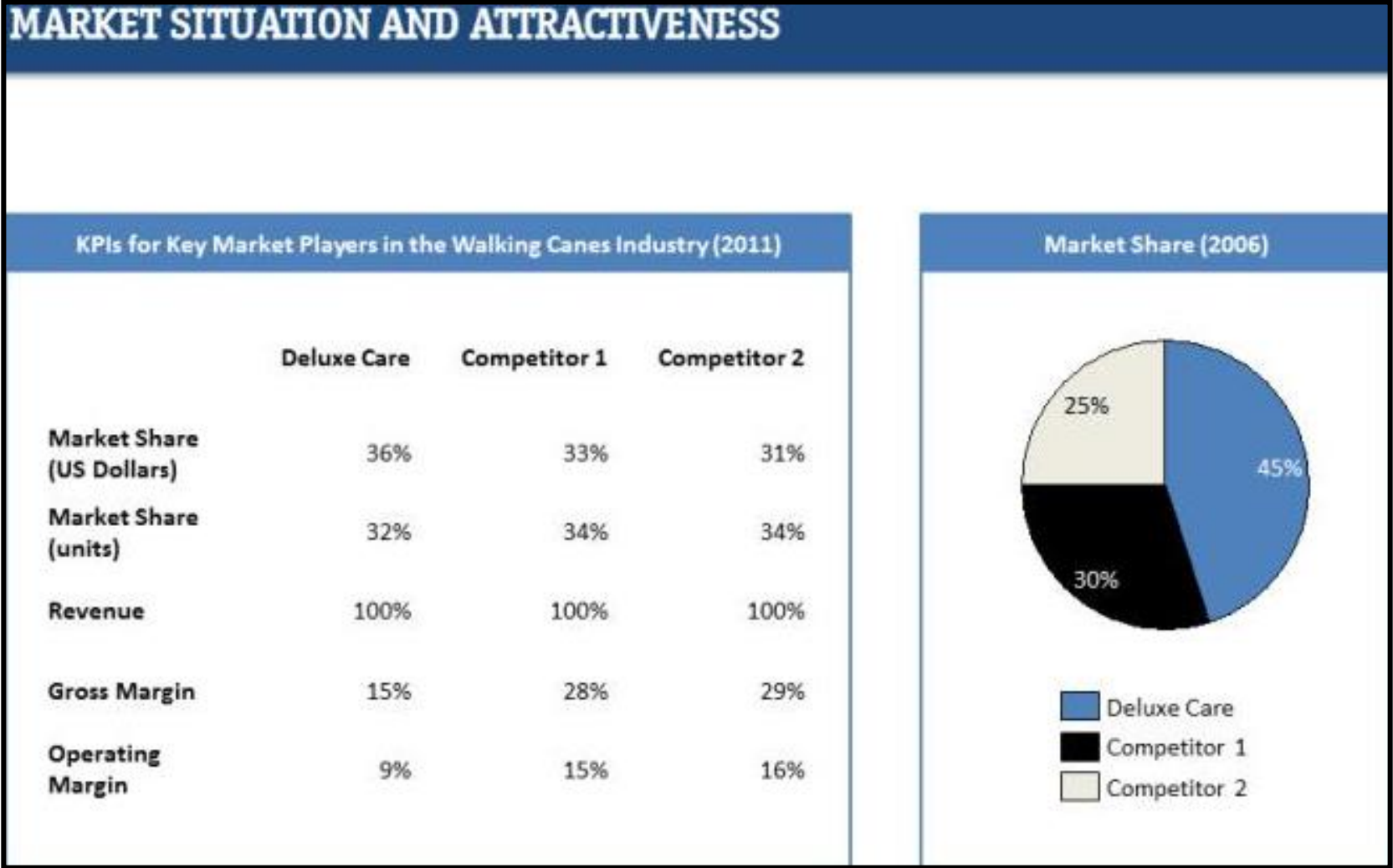
Risks:

- Could cut SG&A costs more
- Could attain better pricing
- May be customer demand for slightly better / more-featured product
- Assumptions on market incorrect and actually really promising
- Disabled, Injured segments could be larger than expected
- Can safely achieve more leverage

Going Forward:

- Consider other medical device manufacturers- Either primary or secondary buyout
- Return funds to investors

Exhibit A: Handout 1



Printer Pump Manufacturer



Written by: Anonymous (Class of 2016)

Case Type: Operations

Case Basics

Delivery:	Interviewee Led
Company:	BCG
Industry:	Manufacturing
Concept:	Supply Chain
Difficulty Level:	Medium
Quants:	Medium
Strategic Thinking:	Hard

Note to the Interviewer:

- The candidate should be able to synthesize high-level information for this case.
- The candidate should keep track of progress and follow-up with interviewer to answer all questions
- The candidates should not be given any information unless asked for or if it is absolutely necessary to nudge her in the right direction.

Fit Interview Questions:

- Tell me a time when you took a risk and what was the result of it?
- What do you like the most about your last job?
- What's your favorite movie?

This is not a company provided case.



Problem Statement:

- Our client is a multi-billion dollar diversified industrial manufacturing company We have been hired by their Printer Pump Manufacturing business unit called Prism which makes pumps that are used in industrial printing presses. This business unit has seen their profits fall in the past 5 years to the point where they are no longer profitable.
- The client has asked our firm the help them:1) understand why profits have decreased, and 2) Help the client come up with a strategy for what to do going forward

Clarifying Questions (*Answer only if asked*):

- **How does Prism operate?:** Prism manufactures the printer pumps and sells them to large industrial printing presses who use and replace them when printing
- **Where does the company operate?** Prism is only in the United States, but the parent company is large and operates internationally.
- **Do we have any specific goals?:** No. There is no target necessarily, we just want to return to profitability in a short-to-medium timeframe.



Part 1: Understand why profits have decreased? (1/2)

- A candidate will most likely start with wanting to take a look at the overall market. The candidate should mention that it is likely that the market as a whole has decreased with the rise of digital.
- A profitability structure would be fine here, but the candidate should focus much of their thought process on the market itself, if they do not do it themselves, guide them to that thinking.
- A strong candidate will build a comprehensive structure that covers both market trends and the financial considerations of the company.
- **Sample**
 - Revenues: Price x Units Sold. A strong candidate should identify that this is a commodity quickly and move on to the market
 - Market dynamics: How has the market changed in the last 5 years
 - Costs: Any basic cost structure is fine provided it covers Labour, Materials, Shipping and OH costs.
- **After initial structuring, wait for the candidate to drive the case. If the candidate does not share where to go next, prompt them by asking: “Which area would you focus on first...” If they don’t say the overall Market, tell them that you’ll focus on the overall Market instead. Hand them Exhibit 1 and ask them what they see notice from the exhibit.**
- This is an intentionally non-intuitive graphic. Answers to Provide: The 4% is the CAGR, Revenues are for the years listed above. The percentages are of volume, not of revenue. The Unit Price is as of today (2012). **Our Prices haven’t changed since 2002 but Comp (our main competitor) has dropped its price from \$3.60 in 2002.**

Part 1: Understand why profits have decreased? (2/2)

- The candidate should identify that this looks like a pretty terrible industry to be in right now. The sales are dropping across the board, our client's market share is shrinking, and they are being squeezed on price by what is essentially a commodity. An excellent candidate will identify all of these aspects
- If the candidate does not try to calculate this on their own, ask the candidate to calculate how Prism's and Comp's market share in terms of volume have changed over the last 10 years.

• Calculation 1

	2002	2012	Change
Prism	$40\% \times 300 = 120$	$25\% \times 200 = 50$	$-70/120 = -58.5\%$
Comp	$30\% \times 300 = 90$	$50\% \times 200 = 100$	$10/90 = 11\%$
Market	300	200	-33%

- If the candidate does not try to calculate this on their own, prompt them to look at how the average price has changed over time
 - 2002: $\$1200/300 = 4K\$/\text{unit}$
 - 2012: $\$600/200 = 3K\$/\text{unit}$
- If not driven by the candidate, prompt them to explore what they would want to look at next. The candidate should identify that the next thing to examine would be the cost structures of the two companies to see why the competitor has been able to decrease their prices. Candidate should want to compare both companies. Then hand out Exhibit 2.

Question 2: How the companies compare (1/2)

Per Unit Costs

	Information per 100 units		Competitor vs Prism	
Costs	Prism	Comp	Raw	Percentage
Material	16000	170000	+10K	10K/160K = 6.25%
Labour	50000	30000	-20K	-20K/50K = -40%
Shipping	50000	30000	-20K	-20K/50K = -40%
Overhead	10000	5000	-5K	-5K/10K = -50%
PPE	70000	30000	-40K	-40K/70K = -57%
Total	340000	265000	-75K	-75K/340K = -22%

- Most candidates will recognize the per unit costs above, if they do not do so on their own, prompt them to do so.
- After handing out the exhibit, the candidate should offer up some insights. A strong candidate would note that there is only an advantage in material costs – likely because this is a part of a large multinational manufacturing company.
- A candidate may suggest that they want to know why the labour and shipping costs are so much higher. Suggest that there is a possibility to get Labour and Shipping on par with Comp, ask the candidate to calculate if this is sufficient to compete in the marketplace.

Question 2: How the companies compare (2/2)

- Ask the candidate for what are some ways to reduce labour and shipping.
 - There is no right answer here, but let the candidate keep providing ideas. This is a creativity exercise

Costs (\$M)	Changes in Costs		Competitor vs Prism	
	Prism	Comp	Raw	Percentage
Material	160	170	+10	$10/160 = 6.25\%$
Labour	30	30	0	0
Shipping	30	30	0	0
Overhead	10	5	-5	$-5/10 = -50\%$
PPE	70	30	-40	$-40/70 = -57\%$
Total	300	265	-35	$-35/300 = -12\%$

- Most candidates will recognize that this will not be sufficient to compete in the market, and the only way to really compete would be to reduce PPE. Ask the candidate to suggest “what are ways to reduce PPE?”
 - Keep prompting for more examples. Broadly, candidates will come up with two ideas – selling the plants or outsourcing some of the production. There is likely no market for the plants as they cannot be used for anything else. Outsourcing is the only potentially feasible solution, but only to the fragmented players in the “others” group
- Ask the candidate for their final recommendation to the CEO



Part 3: Recommendation

- **The interviewer should test the candidate's understanding that they were asked to assess the situation and come up with a strategy**
 - A strong candidate will identify the difference between the information that was discovered about the market and the company specific analysis

- **Potential Recommendation**

This is not a good market to be in. We have seen that the market is contracting, it is a commodity, and there is increased price competition. There are no real opportunities to divest any of the PPE, which was previously high because of the previously higher level of production. In the long term, it would be best to wind this business unit down, as it is hemorrhaging money. In the mean time, it may be possible to stem some of the bleeding by reducing the labour and shipping costs down to the level of our main competitor, but this will not be sufficient on its own.

Our potential next steps would be to examine fully the options for subcontracting out the facilities or seeing if our competitor or anyone else is interested in acquiring this technology, plant, or land that we own to try to turn as close to a profit as we can.

Exhibit 1: Printer Pump Industry Overview

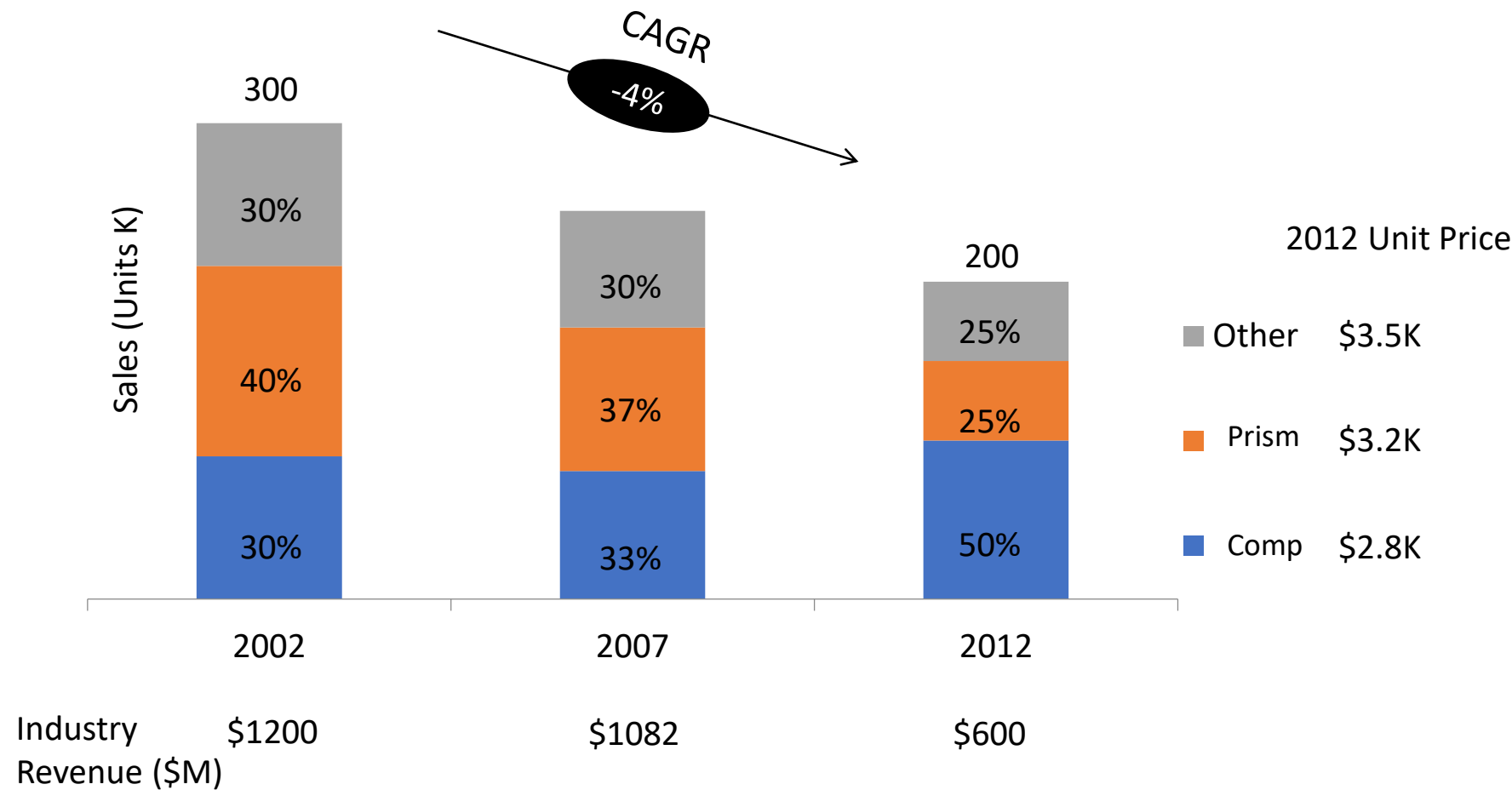


Exhibit 2: Prism Data vs Top Competitor

	Prism	Comp
Volume (K units)	50	100
Sales (\$M)	160	280
<u>COGS</u>		
Material (\$M)	80	170
Labor (\$M)	25	30
Shipping (\$M)	25	30
<u>Other</u>		
Overhead (\$M)	5	5
PPE (\$M)	35	30
Total (\$M)	-10	15

Written by: Geoffrey Ensby (Class of 2016)

Case Type: Restructuring

Case Basics

Delivery:	Command & Control
Company:	McKinsey & Co
Industry:	Media/Entertainment
Concept:	Improve Profitability
Difficulty Level:	Medium
Quants:	Medium
Strategic Thinking:	Hard

Note to the Interviewer:

- The candidate may be uncomfortable with the topic, especially if they are not from the united states.
- There is a unique chart that requires in-depth interpretation to effectively use
- Analogize the arena to any city, if necessary
- Allow for free-form creativity whenever possible

Fit Interview Questions:

- When did you take a calculated risk?
- What is your biggest regret?
- If your plans change on a Saturday, how do you adjust?

This is not a company provided case.

Problem Statement:

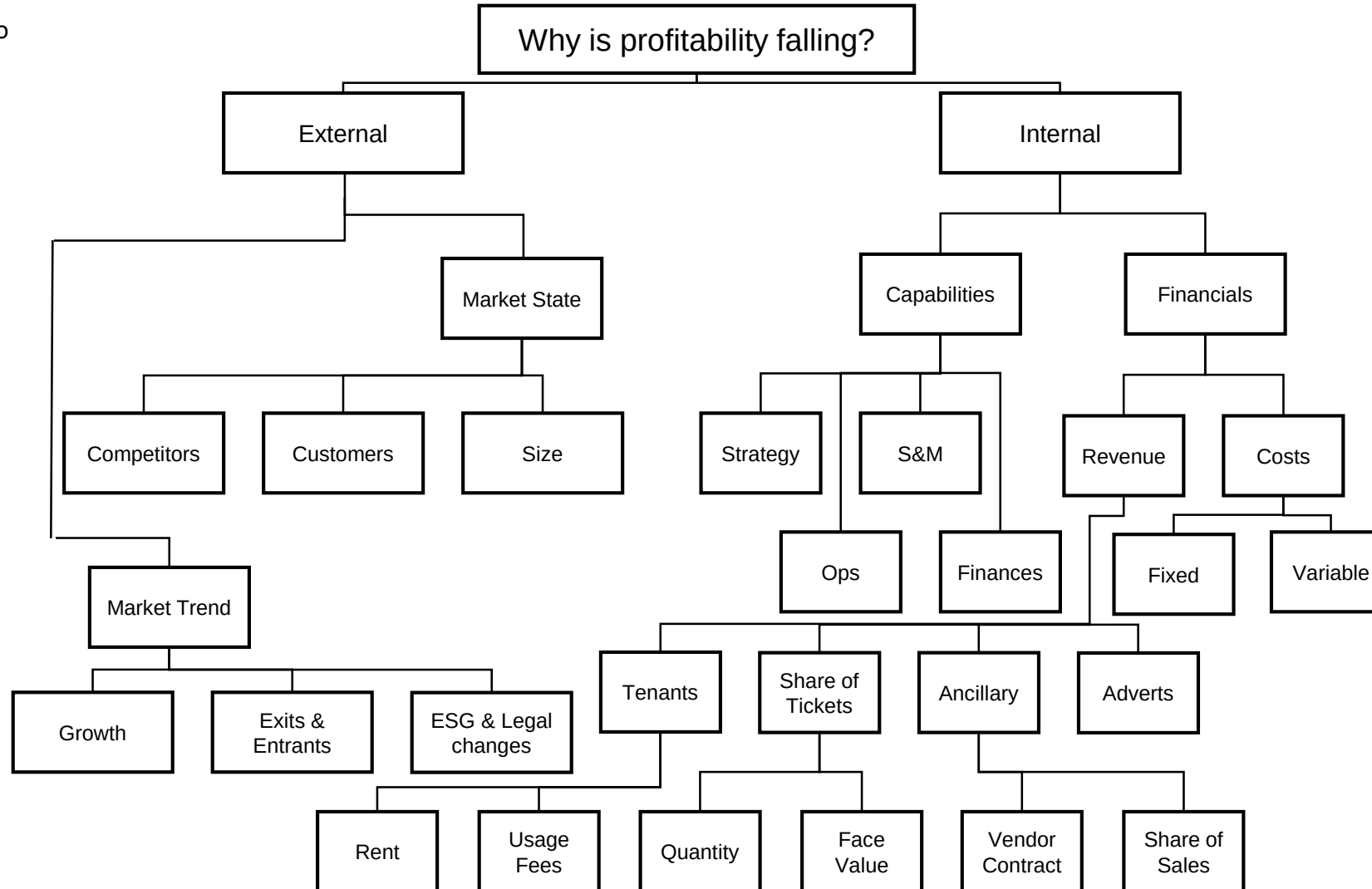
- Your client is a civic arena in a mid-sized heartland US city
- The arena is sufficient for high-level entertainment and sporting events
- However, in the last 3yrs, profitability in both absolute and relative terms has declined
- ***The operator wants to know what can be done to sustain competitive advantage and grow profits***

Clarifying Questions (Answer only if asked):

- The arena is the only one managed by the operator; There are no other associations; There is currently an NHL team playing in the arena; No college teams play on a regular basis, nor are any other pro-level teams expected to occupy
- The arena also hosts concerts, conventions, speakers, and large-format spectacles (ie, circus, performers, shows)
- The arena has control over all the physical property; earns all revenue (share of ticket sales, rent & tenant fees, concession contracts & share of concession sales) and pays all expenses
- There are two large-scale outdoor facilities in the city, one for football and one for baseball; neither are all-weather nor climate-controlled
- There are several universities with their own arenas; one opened recently with 2/3 capacity and a similar setup, but fewer amenities
- The arena is near state-of-the-art, and only requires small regular expenditures to sustain A-level status (A+ is best)
- Focus on absolute profitability; margin improvement is desirable but not main objective
- There is inelasticity, but below a certain point, pricing becomes elastic
- Debt is outstanding, with regular interest and principal payments
- No subsidies are received from the municipal government, nor expected

Question 1: What are important factors to consider when assessing this problem?

This structure is meant to be illustrative. It is important that the candidate hit on all of the different revenue streams, cost centers, and market factors.



Question 2: A new seating and ticket pricing scheme has been developed; assess and determine if it improves profitability compared to the current scheme

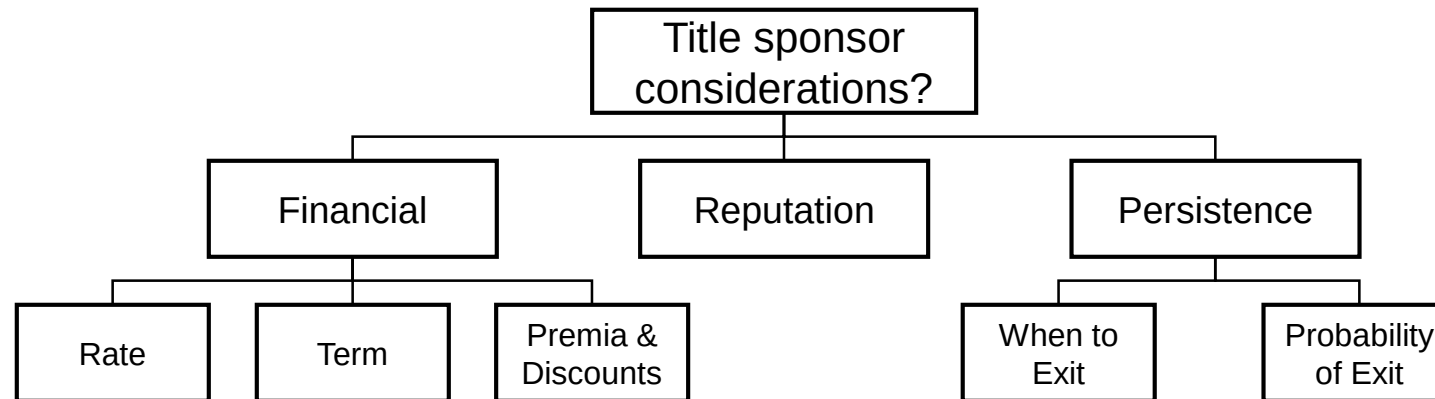
(Provide Exhibit A [**Handout 1**])

Note: this is just one solution that focuses on the deltas between the two plans. Candidates could also calculate the total revenue for each plan then subtract them. This solution is quicker.

	Current		Proposed		
	Proportion	Face Value	Proportion	Face Value	Δ Revenue
Lower Bowl	45%	\$100	45%	\$125	\$202,500
Loge	10%	\$80	10%	\$90	\$18,000
Elite Suite	50	\$2000 Each	50	\$2500 Each	\$25,000
Party Suite	40	\$1000 Each	35	\$800 Each	-\$12,000
Upper Bowl	45%	\$60	45%	\$50	\$40,500
Standing Room	1000	\$40	500 & 1000	\$50 & 35	\$20,000
Decks	n/a	\$20,000 Each	1xLg 2xMd 3xSm	\$25000 Lg \$17,500 Med \$12500 Sm	\$37,500
			Total Change in Revenue		\$331,500

- Clearly, the new scheme is better, due to price discrimination of the second-degree nature

Question 3: One area that has not been explored much is title sponsorship. What are factors that can be considered and what is financial impact?



- Going rate is \$60M for 20yrs
- Mid-size city discount = 5%
- Sole large arena premium = 20%
- Local sponsor discount = 10%

- Baseline = \$3,000,000 (\$60,000,000 / 20yrs)
- Mid-size city = \$2,850,000 (-5% * \$3,000,000 = \$150,000)
- Sole large arena premium = \$3,420,000 (+20% * \$2,850,000 = \$570,000)
- Local sponsor discount = \$3,078,000 (-10% * \$3,420,000 = \$342,000)



Question 4: Discuss other areas that can enhance profitability, on both sides of the P&L statement.

- *Revenue:*
 - Street-level restaurants
 - Theater add-on
 - Additional concourse advertising & sponsorships
 - Recurring contracts with longer stays for major tours:
 - Circus
 - Musical artist or act
 - Theater shows
 - Live extravaganzas
 - Conventions & Meetings
 - Sporting tournaments
 - Exhibition matches
 - Collegiate graduations
- *Costs:*
 - Share management with other venue(s) in area
 - Create marketing alliance with other venue(s)
 - Seek longer stays for events
 - Optimize labor / Enhance productivity
 - Re-finance debt

RECOMMENDATION

Improve profitability by positioning better against new facility while deriving more revenue from existing streams

Methods:

- Reducing rates for smaller acts and optimizing costs associated
- Raising ticket prices for premium seats and lowering for others
- Negotiating larger share of ticket sales in return for lower rent and use fees
- Reset vendor contracts to also take a larger share of sales in return for lower fee
- Adding a title sponsor
- Arrange for extended stays in return for larger ticket sales against to lower fee to reduce per-event costs
- Examine current operating model and find efficiencies
- Offer tours and/or open extensive museum for which can charge admission

Risks:

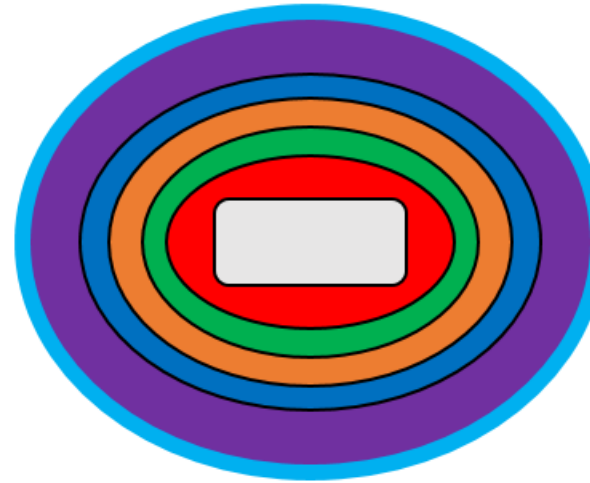
- Cannot cut costs to make lower use fees worthwhile; Competitor cuts costs
- Other facilities draw away acts in nicer weather
- Another facility opens, even if smaller or different format, as specialized
- Tenant moves to a new facility, or even out of town, especially if unwilling to adjust rent structure and/or ticket sales
- Title sponsor cannot be found, or will not pay appropriate rate
- Ticket re-pricing scheme does not generate revenue as expected
- Vendors revolt against plan, or do not generate sales required to offset

Going Forward:

- Alliance(s) with other facilities, at risk of market collusion
- Expand facility with other formats
- Explore adding tenant(s)

Exhibit A: Handout 1

- 18,000 seats
- 90 suite spaces
- 3 large decks



Now

Proposed

Type of Seat	Proportion	Face Value	Type of Seat	Proportion	Face Value
Lower bowl	45%	\$100	Lower bowl	45%	\$125
Loge	10%	\$80	Loge	10%	\$90
Elite Suite	50	\$2000 each	Elite Suite	50	\$2500 each
Party Suite	40	\$1000 each	Party Suite	35	\$800 each
Upper bowl	45%	\$60	Upper bowl	45%	\$50
Standing room	1000	\$40	Standing room	500 & 1000	\$50 & \$35
Decks	n/a	\$20,000 each	Decks	1xLg 2xMd 3xSm	\$25,000 Lg \$17,500 Med \$12,500 Sm

Written by: Drew Koechley (Class of 2019)

Case Type: Interviewee Led

Case Basics	
Delivery:	Interviewee Led
Company:	Hi-Ho State University
Industry:	Consumer Products
Concept:	Market Sizing, Profitability
Difficulty Level:	Medium
Quants:	Easy
Strategic Thinking:	Hard

Note to the Interviewer:
• The case is intended to be primarily interviewee led. Some information is vital to provide, but the interviewer should push the candidate to progress through the case. • Withholding key information (noted in the case) will demonstrate whether the interviewee has a firm grasp on the concepts being tested. • The structure should be customized to the decision criteria a University would need to evaluate before proceeding with an idea. • This case focuses on key concepts such as Market Sizing , Profitability and Market Entry. These require significant attention to detail to cover all aspects of the case. A successful interviewee will identify the unusual relationship between a university and alcohol sales/distribution.

Fit Interview Questions:
• What aspects define an individual as a “quality” leader? • If a project is going poorly, what will you bring to the table to help your team get back on track? • How have you learned from your mistakes in the past?

This is not a company provided case.

Problem Statement:

- The Hi-Ho State University is one of the largest universities in the country and has a storied history of athletics, particularly football.
- It has instituted a policy of tuition freezes once a student starts their degree. This is beneficial for the students, but the decrease in tuition revenues has put a lot of pressure on finances.
- The Board of Trustees has hired us to determine what considerations should be made when considering alternative revenue streams and how that will benefit the University's financial position.

Clarifying Questions:

- Athletics
 - there has been some bad press lately around the football team.
 - The President would like us to explore options around catering to fans but wants to be cautious in the approach.
- "Tuition freeze" means the cost of tuition for an individual student is not raised from the time they enroll until the time they graduate. They cannot raise tuition to offset prior tuition freezes.
- Currently a major (and only, for the purpose of this case) source of revenue for the university is from memorabilia sales – we will do a market sizing exercise to determine this in the first part of the case.



Structure

- Structures should be light but should allude to one or more of the following:
 - Go/No decision criteria
 - Market Sizing
 - Cost/benefit analysis

Determine Existing Revenues – Market Sizing

- The population of consumers that will buy university memorabilia is split between two groups, **alumni** and **sports fans**.
- There are **600,000 alumni** and **9 million fans** (assume these groups do not overlap)
- **Withhold until asked:** Average spend on University associated gear is \$200/alumni and \$50/fan.
- Fans are the target market based on the size/scale.
 - Alumni Market Size: $\$120M = \$200/\text{alumni} * 600K \text{ alumni}$
 - Fan Market Size: $\$450M = \$50/\text{fan} * 9M \text{ fans}$



Brainstorm for New Sources of Revenue

- **Ask:** how do you think the university can generate higher revenues?
 - This can be skipped if the candidate already has ideas in the main structure

Evaluating Ideas for Revenue Generation

- After the brainstorm, **provide** this information: the university has thought of several ideas to generate revenue but can only take one to market. We have been asked to evaluate each idea.
 1. HSU has a local alum who owns a brewery. He is willing to donate his time to help HSU start their own brewery. The University would incur all other costs.
 2. A board member owns a vineyard with well-regarded wine. He is willing to sell the wine below cost to the University with a co-branded label.
 3. Mobile subscription sports application would provide premier access to athletics coverage across all sports.
- **Provide** exhibit 1 for data on willingness to pay.
- Operate under the **assumption** that only 10% of the Fan base will make a purchase in each category.



Exhibit 1: Fan WTP (Willingness to Pay) - Answer

- Given the three population segments are the same size, the recipient should realize they can average the three WTP figures for each age group to understand the largest opportunity.
- The individual should calculate the full market size of each group, despite there being a clear answer.
- The recipient should select Beer as the target market at this point. Make the candidate answer for both Beer and Wine.**

Idea	Fans that will purchase	Average WTP	Projected Revenue
Brewery	$9M * 10\% = 900K$	$(\$30 + \$50 + \$70) / 3 = \$50$	$900K * \$50 = \$45M$
Wine Collection	$9M * 10\% = 900K$	$(\$15 + \$30 + \$75) / 3 = \$40$	$900K * \$40 = \$36M$
Mobile App	$9M * 10\% = 900K$	$(\$5 + \$15 + \$10) / 3 = \$10$	$900K * \$10 = \$9M$

Other Considerations

- After the WTP calculation, **ask**: The Board of the University is skeptical of starting their own Brewery to generate revenue. Although the wine is also an alcoholic beverage, the Board is less skeptical about that option. Why might this be?
 - Reminder: the Beer option requires capital investment, while the wine option allows the University to co-brand the bottles with no up-front investment.
 - Answer**: can include any of the following line items on the Projected Costs table as well as any risks about bad press or legal considerations of producing alcohol.
 - When complete, please **provide** Exhibit 2, the Projected Costs table to the candidate.



Exhibit 2: Projected Cost - Answer

- We have been trying to figure out if the winery is a better option for the university than running the brewery.
- **Answer:** The Wine Collection is more profitable.

	 Brewery	Wine Collection 
Revenue	\$45M	\$36M
COGS	\$(14.5)M	\$(4.25)M
Profit	\$30.5M	\$31.75M

Recommendation

- **Summary:** The University should invest in the Wine Collection because it will produce \$31M+ in profit.
- **Analysis:** story should follow candidates' path to conclusion.
- **Risk:** could include legal, PR around a college distributing alcohol or other market considerations such as competition in the Wine market.
- **Next Steps:** Open ended

- **Author's Note:** Ohio State started an “annual alumni wine collection” during my first year at Tepper. This is an ode to that unusual business decision.

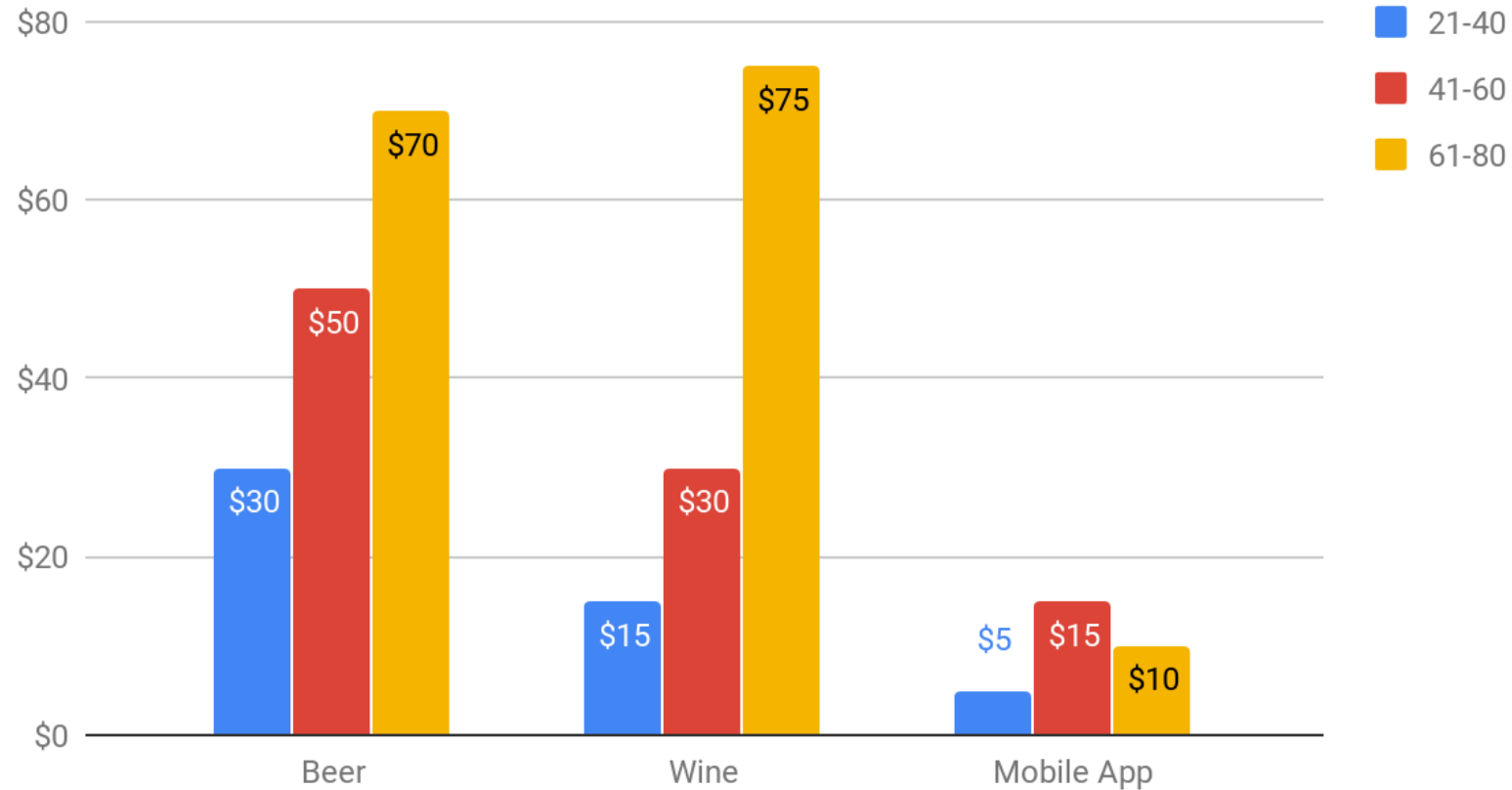
Exhibit 2: Projected Costs




Cost Item	Brewery	Wine Collection
PPE	\$8.0M	-
Bottling/Labeling Cost	\$2.0M	\$2.5M
State/Federal Licenses	\$2.0M	-
Licensing Fees	-	\$0.25M
Distribution Cost	\$1.5M	\$1.5M
Legal Fees	\$1.0M	-

Exhibit 1: Fan WTP by Age

Fan Average WTP by Age Group



*Each segment of the population is split evenly between each age group.

Written by:

Case Type: Operations

Case Basics	
Delivery:	Interviewee Led
Company:	
Industry:	Manufacturing
Concept:	Operations
Difficulty Level:	Hard
Quants:	Medium
Strategic Thinking:	Medium

Note to the Interviewer:
• This case has several exhibits, however the candidate should not be given an exhibit unless there is a specific hypothesis or diagnostic they wish to test or conduct • This is a profitability case that focuses mostly on the operational aspects of manufacturing

Fit Interview Questions:
• Tell me about a time when you had to propose something controversial. How did you handle the pushback? • What do you consider your greatest accomplishment. What allowed you to succeed?

This is not a company provided case.

Problem Statement:

- Our client, GSIA United, is a domestic manufacturer whose products are used in heavy manufacturing. They produce and warehouse their products out of a factory in Burns, Oregon.
- Recently the client has made a major push to dramatically grow the business and customer base domestically, almost tripling its revenues over a two year period. Unfortunately, despite major increases in revenue, the company has not been able to improve its profitability, calling its growth plans into question.
- Our client has hired the firm to diagnose the issue with the companies profitability and recommend a solution.

Clarifying Questions (*Answer only if asked*):

- **How does the company sell its product?:** This is a B2B company, that sells it's products directly to downstream industries involved in heavy manufacturing.
- **What is the industry/competitive landscape?:** The company is a smaller competitor in a larger industry. The industry as a whole is growing and is expected to continue to grow for some time.
- **Do we have any specific financial goals?:** No. We want to find a reasonable method to continue to grow profitably.
- **How has the company been achieving its growth?:** They have undertaken a massive sales and marketing effort to acquire new customers.
- **Has the company made any major changes to its processes?:** No. The company uses its existing assets and processes to serve its customers.
- **Is the company global?:** No, the company is a smaller shop that serves domestic customers out of its Oregon factory.

Case Guide: Structuring

- The candidate should begin by discussing the major levers that could be causing the problem. A profitability framework would be suitable in this case.

Revenue

Revenue is Price * Quantity

Price: We may be charging below market rates to rapidly gain market share.

Quantity: We may not have sufficient volumes to the extent that we are able to meet our fixed costs. **If the candidate mentions this, question them on this as the manufacturer has been rapidly growing.**

Cost

Fixed Cost: Fixed costs will consist of Selling, General, & Administrative (SG&A), R&D, Maintenance, Depreciation, Supervisory Labor (indirect labor), Occupancy, and other fixed costs. A good candidate will hypothesize that SG&A will be higher due to the recent growth push. They may also believe that depreciation may be high if the company is investing in its manufacturing assets.

Variable Costs:

-Raw Materials: Increased demand may be forcing us to go to new suppliers that charge higher rates

-Labor: We may be using too much overtime or employing expensive labor to meet product demand

-Distribution: As we have expanded, we may not have designed our distribution network to cost effectively deliver to new geographies. We may not be using truck capacity effectively, forcing to pay more for LTL (Less-Than Truckload) shipping as opposed to FTL (Full Truckload) shipping.

A strong candidate will recognize that if the company's volumes are increasing greatly, but profit continues to be poor then the problem likely is with the variable costs.



Case Guide: Overview

- If the candidate is struggling to move along, provide them with the the income statement (Exhibit 1) and focus on the gross margins. From there they should look at the COGS breakdown (Exhibit 2), and recognize that there is a distribution network and labor cost problem. Exhibit 3 should allow them to confirm this and Exhibit 4 should help them understand the financial benefit of a new factory.
- The above order of exhibits is the most logical, but candidates should be free explore exhibits in any order.
- A candidate may want to explore pricing. There are no specific pricing exhibits. After viewing exhibit 1 if the candidate is very on insistent on knowing the price per product, you may tell the candidate that the average price has been steady year on year. No benchmarking information is available.
- There are a lot of calculations that can be done on this case. Not all of them are necessary so long as the candidate is able to provide reasonable interpretations. They key is to use calculations to support intuition and hypotheses. Reasonable estimation techniques should also be used to make calculations easier, where applicable (reaching the exact numbers in the answer key is not necessary so long as the approach is valid and the results are reasonable).

Exhibit 1 Guide: Income Statement

Overview

- This exhibit is a basic income statement from 2013-2015.
- The candidate should quickly identify that gross margins have dramatically fallen due to COGS. This suggests that the labor, material, or distribution costs have risen on a per unit basis and should be further explored

Income Statement Analysis

	2013	2014	2015
Revenue	9.1	17.4	25.7
COGS	6.8	15.3	24.7
Gross Profit	2.3	2.1	1.0
Gross Margin	25%	12%	4%
SG&A	0.5	1.5	2.0
Other	0.5	0.5	0.5
Net Profit	1.27	0.08	-1.50
Net Margin	0.14	0.00	(0.06)
Revenue Growth	-	91%	48%
Var Cost Growth	-	125%	61%
Total Cost Growth	-	122%	57%

Analysis

- SG&A has increased significantly, however given the recent push to increase revenues, this seems justifiable as the cost of acquiring new customers, R&D etc.
- Cost of Goods Sold has risen significantly as a percentage of revenue from 75% to 96%. This indicates that the per unit cost has risen and merits further exploration.
- Other key insights that the candidate may bring up are that costs have grown faster than revenues (91% in 2014 and 48% in 2015 versus 122% and 57% respectively).

Exhibit 2 Guide: Cost of Goods Sold

Overview

- This exhibit breaks down the cost of goods sold from 2013-2015. It is at a total and not a unit level.
- The candidate should analyze each component as a percentage of that year's revenue. They may also choose to look at the percentage of the total cost of goods sold, however, this information can be misleading when doing year on year comparisons. The candidate should identify labor and distribution costs as the driver behind degrading margins.

	COGS Breakdown					
	2013		2014		2015	
	Amt	% of Rev	Amt	% of Rev	Amt	% of Rev
Revenue	9.1	100%	17.4	100%	25.7	100%
Distribution	0.7	9%	3.0	17%	5.3	20%
Materials	3.4	38%	6.5	38%	9.6	38%
Labor	1.7	19%	3.8	22%	6.9	27%
Other	1.0	11%	2.0	11%	2.9	11%
Total COGS	6.8	75%	15.3	88%	24.7	96%

Analysis

- Materials and Other components of COGS are stable over time as a percentage of revenue.
- Distribution and labor costs have risen by over 120% 40% per unit of revenue from 2013 to 2015, respectively.

Possible Hypotheses:

Labor: A good hypothesis for labor increases is that capacity has been exceeded forcing the factory to rely on more overtime. Other possible explanations could include shortages of skilled labor, more customers buying products that have a higher direct labor content, etc.

Distribution: Since we know the client is trying to sell to customers in new geographies, the increase in distribution costs seem to indicate that the newer customers are located further away and thus have a higher freight cost. Other possible reasons could be low truck utilization (LTL vs FTL), increase in transportation costs (e.g labor and gas prices), etc.

Exhibit 3 Guide: Annual Distribution Costs

Overview

- This exhibits shows the current distribution network including the cities where the customers are located, the volumes (in LBS of product), and the cost per LB that the company spends on distribution.
- The candidate should provide qualitative analysis similar to the following: Customers are clustered around two regions, the West and the Midwest. Both sets of customers are serviced from the same Oregon factory. The distribution cost to the Midwest customers is approximately four times higher.
- Based on the distribution map it is clear that an additional factory in the Midwest could significantly lower distribution costs. We could also look at alternatives such as shipping by rail, sharing the freight cost with the client, using existing trucks more efficiently, etc.

Region	Annual Volume (LBS)	Annual Distribution Cost
West	47.978 M	\$1,021,800
Midwest	59.280 M	\$4,229,400

Exhibit 4 Guide 1/2: New Factory Freight Analysis

Overview

- This exhibit looks at the distribution costs for a new factory located in Normal, IL
- If the candidate asks, they can assume that a new factory will cost around \$10 million and SG&A and other expenses will increase by an additional \$1 million. Cost of capital is 10%.
- We should only use the new factory for the 3 Midwestern cities.
- Distribution cost per city can be calculated by the formulas:

$$\text{cost per LB} = \frac{\text{Freight Charge} + \text{Packing Cost}}{\text{Capacity}}, \quad \text{Cost Savings} = \text{Annual LBS} * (\text{Cost per LB}_{\text{Old}} - \text{Cost per LB}_{\text{New}})$$

- Total Annual Savings after increased factory costs are \$3.2 – 1.0 M = \$2.2 M, Gross margins would increase to 16%
- The present value of building a new factory assuming no growth is 2.2M/10%-10M= \$12 M.
- This assumes that the other COGS components will remain unchanged and trucks could be filled to capacity.

City	Cost per LB Old	Cost per LB New	Δ Cost per LB	Annual LBS	Savings (\$M)
Des Moines, IA	0.065	0.020	0.045	11.40 M	\$0.51
Springfield, IL	0.070	0.015	0.055	20.52 M	\$1.13
Bloomington, IN	0.075	0.018	0.057	27.36 M	\$1.56
			Total	59.28 M	\$3.20

Exhibit 4 Guide 2/2: New Factory Freight Analysis

Overview (continued)

- Candidate should recognize the limitations of this analysis. It assumes labor and materials cost will be the same across regions, unlimited lifespan of the factory, no further growth, no depreciation tax shield, shipping cost has no volume constraint, etc. They should also understand that this may or may not be a good idea depending on what other investment opportunities the client has available, whether alternative shipping methods may be feasible, and/or the client can share the shipping costs with its customers.

Labor Costs

- If candidate want's to explore labor cost reduction or if you wish to challenge them, tell them that “After some analysis the team has determined that each factory has a labor capacity of 60 M LBS of product, annually. To produce in excess of the threshold at a factory the company employs overtime work at double the standard labor cost per LB. How much will the company save in labor costs with a second factory?”
- First, determine the 2015 Labor cost and overtime labor cost per LB. We define X as as our labor cost per LB and 2*X as the overtime labor cost per LB. Solve $X * (60 \text{ M LBS}) + 2 * X * (106.2 \text{ M LBS} - 60 \text{ M LBS}) = \$6.9 \text{ M Labor Costs} \Rightarrow X = 0.045 \frac{\text{Dollars}}{\text{LB}}$
- Since both factories will be producing under 60 M LBS. The new total labor cost will be $0.045 \frac{\text{Dollars}}{\text{LB}} * 106.2 \text{ LBS} = \$4.8 \text{ M}$. A savings of $6.9 - 4.8 = \$2.1 \text{ M}$ per year.
- The new total savings present value is $(2.2\text{M} + 2.1\text{M})/10\% - 10\text{M} = 4.3\text{M}/10\% - 10\text{M} = \$33 \text{ M}$



Case Guide: Wrap Up

- Based on the analysis of the case, the candidate should make a final recommendation to the client. A good recommendation would include:
 - A brief explanation of the cause of the problem and the solution of building a new factory
 - Quantitative benefits: distribution and labor cost reduction
 - Other qualitative benefits: reduced lead times for the Midwest customers, more scale to support further growth
 - Risks: increased overhead, less flexibility to scale down in an economic downturn, differences in product quality across factories
 - Next Steps: Compile and vet detailed cost and saving estimates, survey sites, explore financing options, build and qualify new factory, negotiate freight contracts, hire management and labor, go live, etc

Exhibit 1: Selection of Income Statement Data by Year (\$M)

	2013	2014	2015
Revenue	9.1	17.4	25.7
COGS	6.8	15.3	24.7
SG&A	0.5	1.5	2.0
Other	0.5	0.5	0.5

Exhibit 2: Cost of Goods Breakdown (\$M)

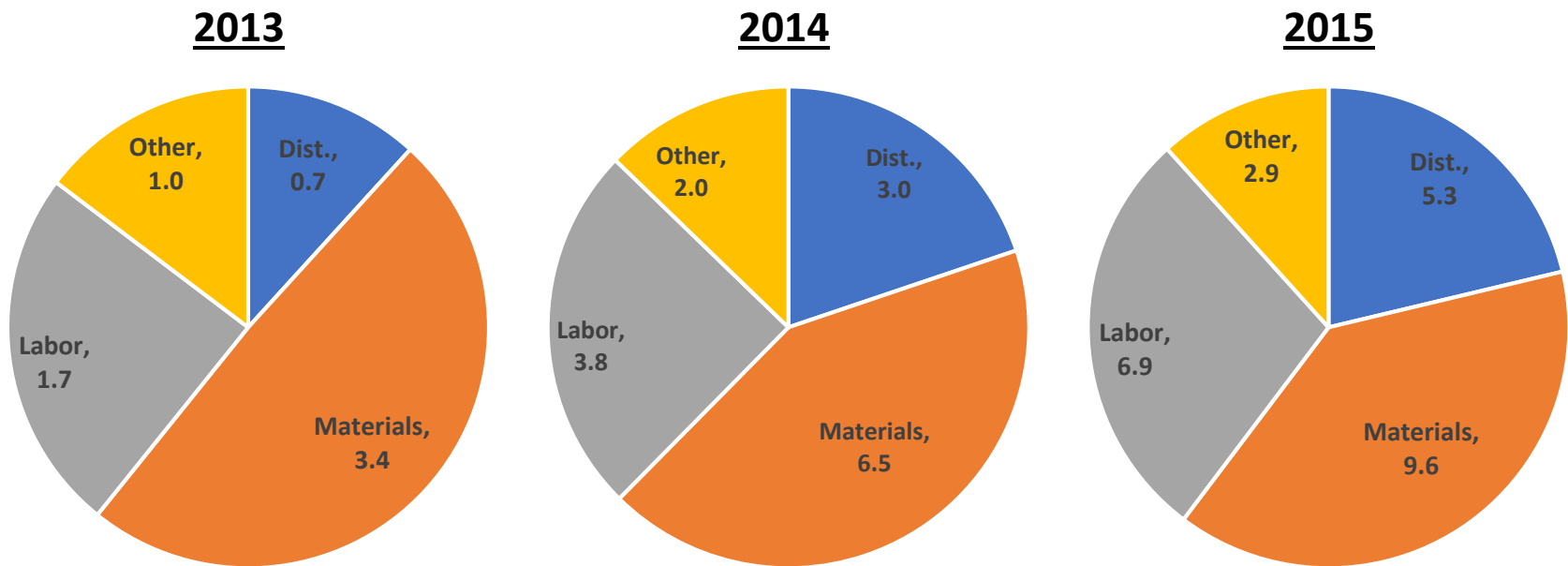


Exhibit 3: 2015 Annual Distribution Costs

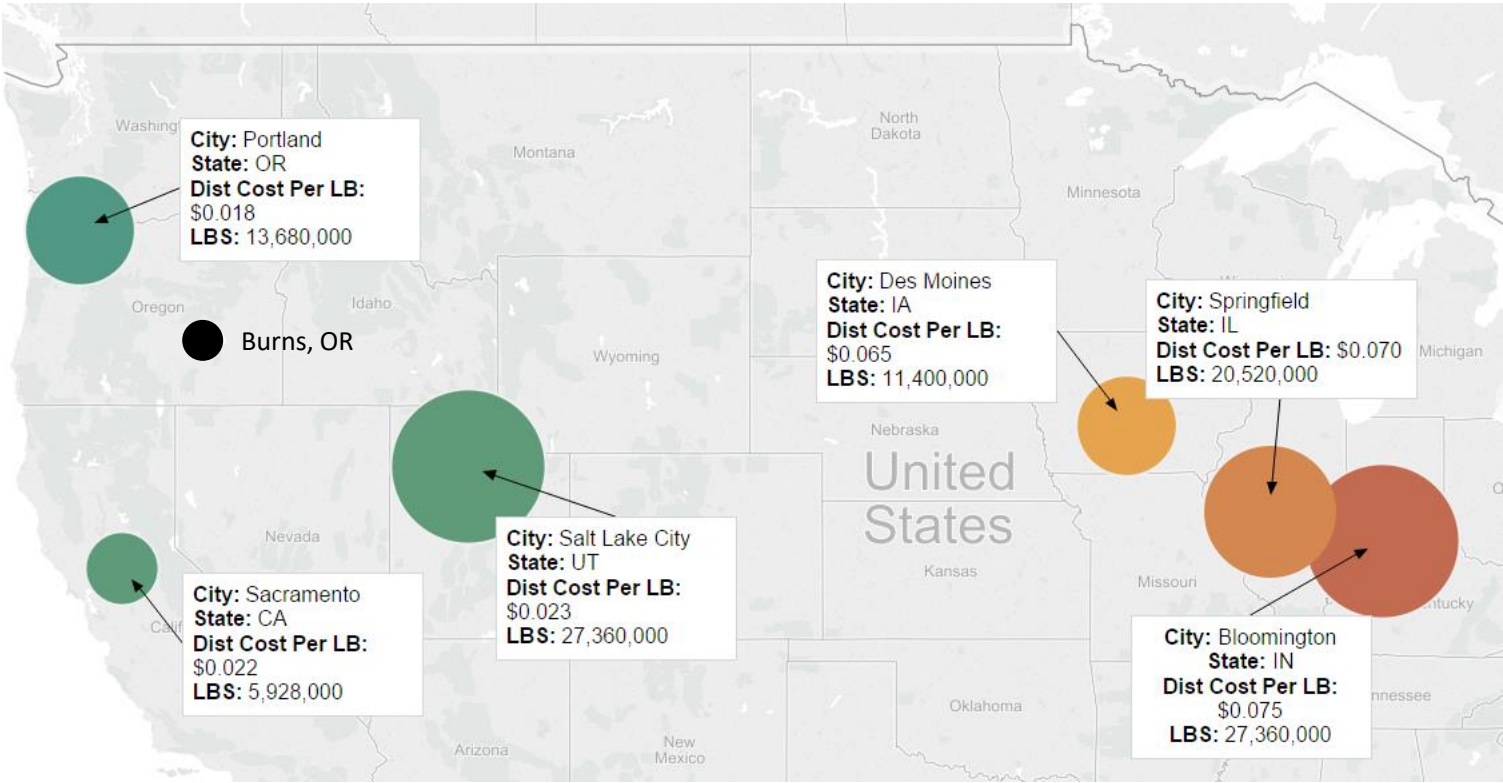


Exhibit 4: New Factory Freight Analysis

Freight Costs			
Freight Costs from Burn, OR (Existing)		Freight Costs from Normal, IL (New)	
Destination	Freight Cost (Per Truck Load)	Destination	Freight Cost (Per Truck Load)
Sacramento, CA	\$450	Sacramento, CA	\$3,250
Portland, OR	\$290	Portland, OR	\$3,400
Salt Lake City, UT	\$490	Salt Lake City, UT	\$2,975
Des Moines, IA	\$2,070	Des Moines, IA	\$360
Springfield, IL	\$2,260	Springfield, IL	\$170
Bloomington, IN	\$2,450	Bloomington, IN	\$284

*All freight rates exclude \$400 cost per truckload for packaging and handling

*Rates are for 25 ft Truckload which has a maximum load of 38,000 LBS

Written by: Frank Shang (Class of 2017)

Case Type: Resource & Capacity

Case Basics

Delivery:	Interviewee Led
Company:	BCG
Industry:	Aerospace and Defense
Concept:	Creativity
Difficulty Level:	Hard
Quants:	Medium
Strategic Thinking:	Hard

Note to the Interviewer:

- This case is fairly straightforward once the approach is defined
- The key aspects are defining the problem, brainstorming potential solutions and thinking creatively
- Although the problem is relatively unique, the logic should transcend business problems
- Structuring throughout, whether with equations and tables or trees will help solve the problem

Fit Interview Questions:

- Please describe to me a time when you had to build consensus amongst a conflicted group
- Please describe to me a time when you had to overcome an unforeseen obstacle

This is not a company provided case.

Problem Statement:

- President Obama approached us to help him tackle the greatest challenge in human history – he wants to take Man to the planet Mars in the next decade
- We have already successfully landed 3 rovers on Mars - much of launch and propulsion technologies are ready
- ***How would you help President Obama and NASA think through this problem?***

Clarifying Questions (*Answer only if asked*):

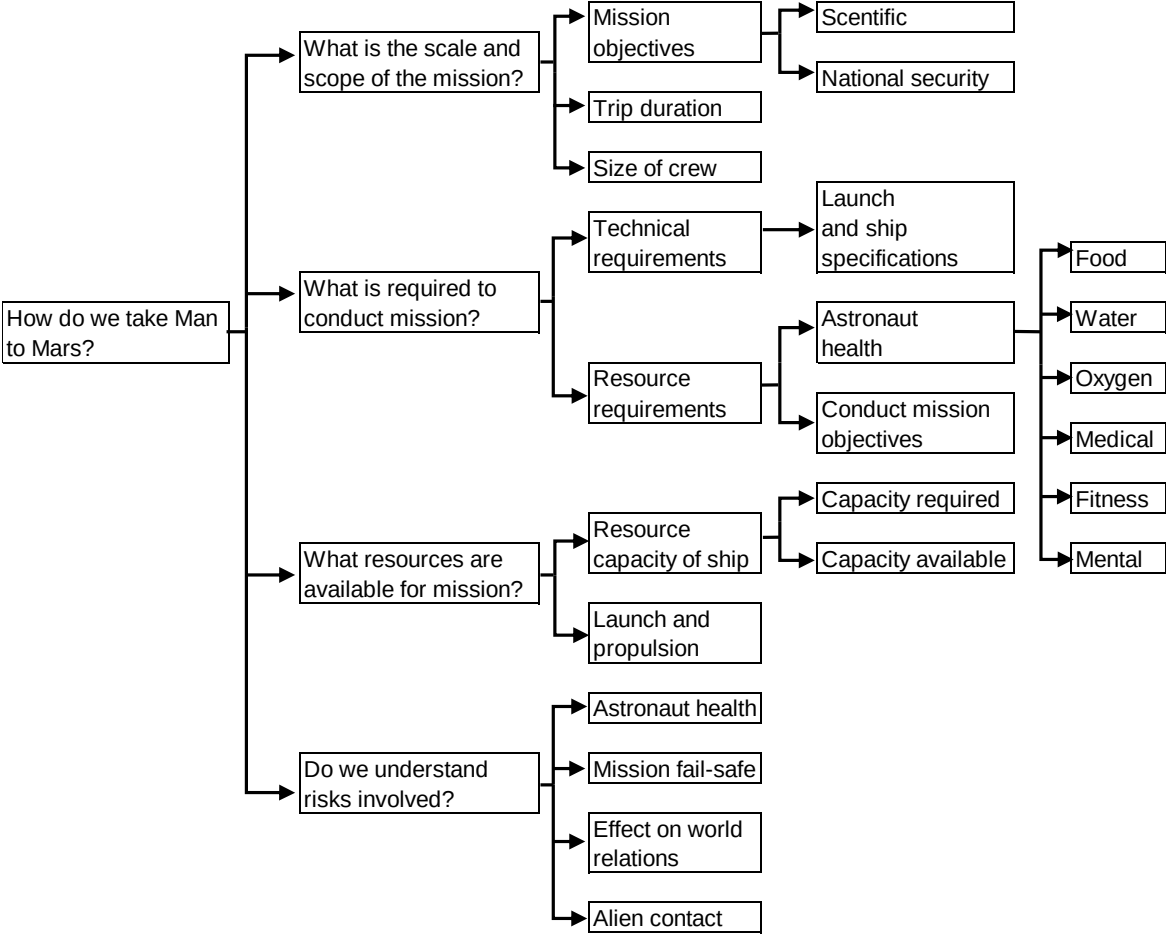
- The proposed team consists of 4 astronauts that can execute this mission successfully
- The objective of the trip is for the astronauts to reach mars, plant the flag, and return
- The duration of the journey is one year roundtrip
- The major components of a space program are rocketry (launch, propulsion), life support (astronaut life and health) and research
- Major resources required to sustain life in space are food, water, oxygen
- Major internal equipment required for mission are medical, recreational, and scientific
- We have launch and propulsion technologies in place already to accomplish this mission
- The nation is aligned to this mission and there are no policy issues

Part 1: How would you approach this problem? (1/2)

- A candidate is likely to appear overwhelmed by the prompt. The key is to define the problem clearly upfront and understand that the difference between this mission and the previous rover missions is the **Human Factor**. Space may appear daunting but think about the essential resource needs of life (these are the same everywhere).
- A strong candidate will build a comprehensive structure that covers the key steps to this mission in a logical manner. Once the mission is defined and the resources for the crew are outlined, the candidate should recognize that there is a gap between the volume of the resources needed and the ship's capacity. This conclusion should lead to a discussion on strategies for closing the gap.
- **Define the Problem**
 - How long is the mission? The roundtrip mission will span a total of 1 year
 - What is the size of the crew? We are proposing a crew of 4 Astronauts
 - Do we have any technological gaps that we need to overcome? We are good on the rocketry side of things but we do not have a good understanding of what is required from the life support side of the equation
- **Identify Resources Requirements:**
 - A strong candidate will put themselves in the shoes of the Astronaut and think through what is required on a daily bases to sustain life and maintain both mental and physical health
 - This discussion may require some intervention by the interviewer, push the interviewee beyond the primary objective of this case and discuss some of the externalities involved including risks and repercussions
- **After initial structuring, wait for the candidate to drive the case. If the candidate does not share where to go next, prompt them by asking: "Which area would you focus on first..."**



Part 1: How would you approach this problem? (2/2)



Note: This is a sample framework that outlines a multitude of considerations

This case specifically will focus on the resource requirement and capacity branches of this case.

The logic being that we've outlined that we've sent rovers to Mars, we can handle the rocket side of things, **the main difference between this mission and previous ones is the human factor**

As the interviewer, drive the interviewee to resource requirements if they appear lost



Part 2: What resources are required by the Astronauts and at what quantity?

- After initial brainstorming and discussion, steer the candidate to focus on identifying the resource requirements.
- If the candidate asks about the following, provide the information verbally, a strong candidate will tease out the resources required, structure the data provided, recognize the need to standardize the units and ask for conversions factors.
- The solution below **assumes 350 days in a year**. Feel free to let candidates use 360 or 365 if assume it. The numbers should still be in the same ballpark.

Resource requirements						
Consumables per astronaut			conversion factor	lbs per day	lbs per yr	total crew
Food	4 lbs	per day	1 : 1	4	1,400	5,600 lbs
Water	2 liters	per day	1 : 2	4	1,400	5,600 lbs
Oxygen	400 ft^3	per day	10 : 1	40	14,000	56,000 lbs
Medical	100 lbs	total mission			100	400 lbs
Physical health	500 lbs	total mission			500	2,000 lbs
Mental health	200 lbs	total mission			200	800 lbs
						70,400 lbs

* provide conversions
when prompted by
interviewee

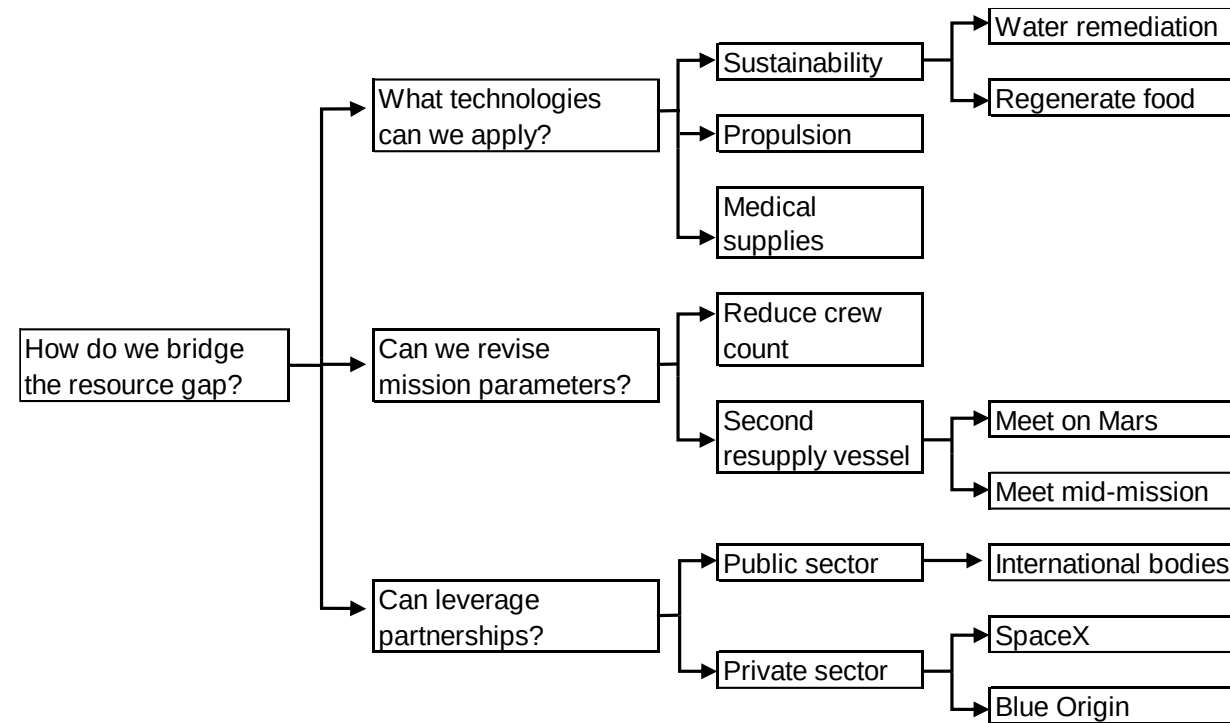
Synthesis

For a total crew of 4 astronauts, ~70k pounds of supplies are required to sustain the trip. Because space is a vacuum, the total amount must be supplied from Earth.

A strong candidate will then consider the capacity of the ship to evaluate the feasibility of the mission

Part 3: The payload capacity of the ship planned for this mission is 50,000 pounds, how do we bridge the resource gap?

- A strong candidate would take this opportunity to structure mid-case, below is a sample framework
- Take this opportunity as the interview to test the comprehension of the case and push for additional answers. It never hurts to ask a candidate “anything else” after they appear to have run out of ideas to test their brainstorming abilities.





Part 4: Recommendation

- **There is no 'right' answer here, but rather listen to the candidate summarize the problem, define the approach and defend the solution**
- A strong candidate will be concise in their delivery, cover the important numbers, clearly defend their solution as well as outline additional solutions and discuss potential next steps and risks
- The solution selected should be impactful and be thoroughly discussed during the case

Written by: Ian Sullivan and Patrick Collins (Class of 2016)

Case Type: Government Regulation

Case Basics

Delivery:	Interviewee Led
Company:	Bain
Industry:	Environmental
Concept:	Regulation
Difficulty Level:	Hard
Quants:	Medium
Strategic Thinking:	Hard

Note to the Interviewer:

- This case at first seems to be about the emissions benefit the EU would expect by improving the proportion of electric vehicles on its roads
- Instead the case turns towards the emissions from power plants and waste in the electricity grid
- This case is designed to include many investigative paths, some of which have dead ends.
- Be prepared to keep the interviewee on track.

Fit Interview Questions:

- Who was the most challenging person you worked with during your previous position? Why was it challenging to work with them and how did you react?
- Give me an example of the most complex project you have worked on, including your role and the outcome.

This is not a company provided case.

Problem Statement:

- Our client is the European Union Environmental Regulation Counsel (EU ERC). In an effort to reduce CO₂ emissions, they are proposing imposing regulations requiring automotive dealers to sell a higher proportion of electric vehicles and more fuel efficient vehicles.
- Our goal is to evaluate the efficacy of their proposed legislation.
- There are two proposed options for the regulation:
 1. Require electric vehicle sales make up 50% of fleet sales by 2040 (If asked: numbers of vehicles, not \$).
 2. Fuel efficiency should be extended to an average of 3 liters per 100 kilometers (km) by 2040.

The main goal of the EU ERC is to reduce CO₂ emissions.

The candidate should proceed to break down the problem into an evaluation of each of the options against this objective. If they don't take this approach, suggest they start by evaluating proposal 1.

Clarifying Questions (*Answer only if asked*):

- Currently, electric vehicles make up 15% of all fleet sales.
- Currently, average fuel efficiency is 4 liters / 100 km.
- EU Population is 500 Million.
- Yearly vehicle sales in the EU are 12 million.
- Electric vehicles use on average 10 kilowatt-hours (kWh) of energy per 100 km.
- Power plant emissions in the EU are given on Exhibit 1.
- On average, 25% of energy produced is lost to power grid inefficiencies in the EU.

Proposal 1 Evaluation

- Proposal 1 requires a comparison of the current state and future state. Interviewee should determine from the current state that increasing electric usage actually increases carbon emissions. There is no need to calculate the future state. The interviewee should then move to evaluate the second proposal.
- To calculate the CO₂ emissions the candidate will need perform a market sizing style calculation. The required data is provided below and in **Exhibit 1**. Avg. Usage and CO₂ should be multiplied to get CO₂ per 100KM for comparison. For electric cars, divide by (1-25%) to get true emissions. This is a key point in brainstorming. Interviewee may need support to identify this factor.
- If the interviewee does not identify that the proposal is not effective, allow them to calculate the weighted average and then correct their course.

Gas Powered Cars	#	Notes
% of total EU cars	85%	NOT NEEDED, only provide if requested
Avg. Usage	4	L / 100km
CO ₂	0.35	kg CO ₂ / L
CO₂ / 100km	1.4	kg CO₂ / 100km

Electric Powered Cars	#	Notes
% of total EU cars	15 %	NOT NEEDED, only provide if requested
Avg. Usage	10	kWh / 100km
CO ₂ (Power Plant Chart)	0.1 2	kg CO ₂ / kWh
Transmission Loss	25 %	
CO₂ / 100km	1.6	kg CO₂ / 100km

Proposal 1 Math – Shortest Route to Answer

Gas Powered Vehicles:

$$4 \text{ L} / 100 \text{ km} \times 0.35 \text{ kg CO}_2 / \text{L} = 1.4 \text{ kg CO}_2 / 100 \text{ km}$$

Electric Powered Vehicles:

$$\begin{aligned} \text{Exhibit 1 (Power Plant Chart)} &= (0.1 \times 25\%) + (0.2 \times 10\%) + (0.3 \times 20\%) + (0.0 \times 15\%) + (0.05 \times 30\%) \\ &= 0.12 \text{ kg CO}_2 / \text{kWh} \end{aligned}$$

$$10 \text{ kWh} / 100 \text{ km} \times 0.12 \text{ kg CO}_2 / \text{kWh} = 1.2 \text{ kg CO}_2 / 100 \text{ km}$$

$$25\% \text{ Transmission cost} \Rightarrow 1.2 \text{ kg CO}_2 / 100 \text{ km} \times (1 / 0.75) = 1.6 \text{ kg CO}_2 / 100 \text{ km}$$

Because more CO₂ is produced from using electric cars, increasing the number of electric cars sold will not improve CO₂ emissions.

Alternatives a strong candidate should identify:

Improve power plant CO₂ emissions, reduce transmission cost of electricity, improve kWh efficiency of electric cars

Proposal 2 Evaluation

“What would be the market reduction in passenger car CO₂ emissions if proposal 2 was implemented?”

- Proposal 2 also requires a comparison of the current state and future state. Interviewee should compare the prospect of reducing average fuel consumption from 4 L/100 km to 3 L/100 km. We are looking for a precise percentage in overall market reduction.
- Data is provided below. Average usage and CO₂ should be multiplied to get CO₂ per 100KM for comparison. The candidate should quickly realize that there is a 25% reduction in CO₂ emissions. The candidate must remember that this only represents 85% of the market, and should calculate the whole market reduction.

Gas Powered Cars	#	Notes
% of total EU cars	85%	only provide if requested
Avg. Usage	4	L / 100km
Proposed Usage	3	L / 100km
CO ²	0.35	kg CO ₂ / L
CO ² /100km	1.4	kg CO ₂ /100km

Proposal 2 Math – Shortest Route to Answer

Current State:

$$4 \text{ L / 100 km} \times 0.35 \text{ kg CO}_2 / \text{L} = 1.4 \text{ kg CO}_2 / 100 \text{ km}$$

Future State:

$$3 \text{ L / 100 km} \times 0.35 \text{ kg CO}_2 / \text{L} = 1.05 \text{ kg CO}_2 / 100 \text{ km}$$

=> 25% Decrease in CO₂ Emissions From Gas Powered Cars

$$25\% \times 85\% (\text{Market \%}) = 21.25\% \text{ CO}_2 \text{ Market Reduction}$$

Question 2: Other Considerations

- What other considerations should the EU ERC consider when evaluating these proposals?
- (After generating a list) – What considerations do you feel are most important and why?
- (If the candidate is doing well) – How would you approach researching these considerations?
- The intent of this question is to evaluate the creativity and prioritization of characteristics

Potential Solutions:

- | | |
|--|---|
| <ul style="list-style-type: none">• Other sources of CO₂<ul style="list-style-type: none">• CO₂ produced during manufacturing all electric cars vs gas powered cars• CO₂ produced when building power plants of a certain type• Economic Considerations<ul style="list-style-type: none">• Price of lithium• Fees• Job loss due to industry changes | <ul style="list-style-type: none">• Political Considerations<ul style="list-style-type: none">• EU, nation states, trade bodies• Technology Considerations<ul style="list-style-type: none">• Feasibility of technology enabling 3 L / 100 km car efficiencies• Feasibility of technology supporting widespread adoption of electric cars• Cost of implementing policy |
|--|---|



Question 3: Recommendation

- Candidate should provide a recommendation for policy
- Proposal 2 is the most CO² efficient
- Other considerations could improve Proposal 1 or 2

Exhibit 1: Power Plant Emissions

Power Plant Type	Number of Plants	Kg CO ₂ Per kWh	% of Electric Supply
Natural Gas	907	0.1	25%
Coal – Supercritical	15	0.2	10%
Coal – Traditional	215	0.3	20%
Solar	n/a	0.0	15%
Nuclear	101	0.05	30%

The Flow of Rubber

Written by: Maxim Vanhencxthoven (Class of 2016)

Case Type: Operations – Supply Chain Management

Case Basics	
Delivery:	Interviewee Led
Company:	A. T. Kearney
Industry:	Manufacturing
Concept:	Quality and Cost Control
Difficulty Level:	Hard
Quants:	Medium
Strategic Thinking:	Hard

Note to the Interviewer:

- Structured thinking is important in this case. The candidate may not have specific knowledge to solve this problem, but the interviewer should ask the candidate to elaborate on the right levers.
- The candidate could be delving very deep into the details but it is important to see the bigger picture of the issues. Resistance to change, optimization of the supply chain, safety concerns and relationship management are hidden below the surface but play an important role.
- Read the whole case to familiarize yourself with the issues. There’s a lot going on and guidance will be needed.

Fit Interview Questions:

- What topic or issue are you passionate about and do you follow outside your classes?
- Tell me about a situation in which you faced an ethical problem. How did you approach the issue?
- When were you confronted with a person difficult to work with and how did you proceed?

This is not a company provided case.



Problem Statement:

Our client, Store&Ship, is a third party logistics provider for petrochemical companies. Store&Ship has recently started managing the distribution center (DC) of one of their long time clients, Rubber Inc., a global synthetic rubber manufacturer. The DC receives and stores all the production of the nearby plant and receives some additional goods that are shipped in from other regions. The distribution center is responsible to process the shipping orders of Rubber Inc. and ship the goods to the clients of Rubber Inc.

Store&Ship has come to us because they are facing a series of challenges since they have taken over the DC. Their profitability is not what they expected it to be and they also received a significant number of formal complaints and claims from both Rubber Inc and the clients of Rubber Inc., which puts significant pressure on the relationship with Rubber Inc. and damages the reputation of Store&Ship as a reliable global partner. Our client wants to know how they can turn things around, meaning, how do they improve their financial and operational performance.

Clarifying Questions (*Answer only if asked*):

- There's an additional concern of our client: safety. The petrochemical industry is very sensitive to safety track records and it is also the company's number one priority to have people go home in the same way as they came to work. In the current conditions, safety is not guaranteed as it should be. The candidate should try to see the bigger picture by including this in the analysis, but safety has not an immediate effect on the financial nor operational performance. It is however a huge liability and the solution to the problem will eventually improve safety as well.
- Store&Ship is a large company, no financial problems. The company is organized in divisions and every location/operation (the DC for Rubber Inc. is considered a location) is responsible for their own performance.
- The DC (grounds and building) is owned by Rubber Inc, Store&Ship only provides manpower, equipment (forklifts) and expertise to manage the product flow.

Clarifying Questions (*Answer only if asked*):

- Store&Ship has experience with handling large volumes of this material. However, the specifics of this DC make it that they don't have a ready made solution. They don't own the building, which put limits to what they can do. Any substantial change will need approval from Rubber Inc, and financing of any work will need to be negotiated.
- The rubber, which takes the form of 30 kg blocks, is packed into cardboard boxes. Each box weighs between 750 kg and 1000 kg, depending on the type of packaging.
- Complaints of importance are damaged goods. The crucial part here is that forklifts have sharp forks and most of the problems occur by operators poking a whole through the box, pushing in some cardboard into the rubber which makes it unusable. Some boxes can be reconditioned, but others can't and the entire box needs to be sent to scrap.
- When asked why so many boxes get damaged, following reasons can be brought up:
 - Poor training, lack of experience of the warehouse operators
 - Difficult handling of the boxes
 - Overfull warehouse, operating above capacity
- Store&Ship is paid a fixed fee per box they handle (a move). One move on intake, and one move on outbound, both counted based on the amount of boxes on an inbound or outbound transport bill. So even with a full warehouse, revenue for Store&Ship can be low if nothing comes in or gets shipped out.
- Any change that will affect Rubber Inc.'s operation will be hard to accomplish. The production manager has been at the plant for over 30 years and is not receptive to criticism or change.



Operational performance

- The conversation should start about the operational performance because this has an immediate effect on the profitability. In other words, improving effectiveness and efficiency will lead to higher profits because of cost savings.
- Show exhibit 1 to candidate when asked about specifics on the complaints and the current performance.
- **Key takeaway here is that the 39xx grades are much more involved in problems than the other grades. The candidate should be able to get a sense of the situation by calculating the main KPIs, i.e. complaints per shipments and scrapped boxes per boxes shipped.**
- Only a rate of **0.03%** of scrapped boxes would be an acceptable rate.
- This part of the case should be about idea generation, scoping the issues and illustrating the constraints.
- The reasons why there is such a high non conformity rate and a difference between the two types come from the specifics of the boxes in which the two grade groups are packed. Also the fact that the warehouse is over filled and operating above capacity is a main issue. Both reasons are an opportunity to test the practical sense of the candidate.
- The 39xx grades are packed in a box called tricell box (TCB), while the 62xx grades are packed in a twocell box (TWC). The TCBs are high, narrow and have a thin cardboard wall, whereas the TWC is more horizontal type box and has a thick outer wall. Other implications that can be derived from making a small sketch and thinking through how these box types impact the storage, handling and safety risks, such as:

Operational performance

- Because the TCBs are not deep, the forks of the handling equipment can poke the second box behind. This is a major problem, especially because a large number of boxes are damaged when they come from the finishing line at production and hence are received damaged by the warehouse. **This should let the candidate suggest to tackle the problem at the root and address the problem with the Production Manager of Rubber Inc.** The TWC has a bigger footprint and the pallet covers the entire length of the forks, so no stabbing of the next box possible. You might not even see it clearly at first, but over time, the rubber starts oozing out, called *coldflow*.
- The TCB is not very strong structurally, it can only be stacked two high (one on top of the other). To maximize storage capacity, these boxes are stored in racks up to four levels high. The reach trucks to manipulate them are difficult to operate, the vision is hindered and more damage is done this way. TCBs can be stored on the floor, but this has a low ton/sq ft metric, because they are smaller and can only be stacked 2 high.
- The TWC is strong and can be stacked 3 high while standing on the floor. The ton per square foot however is lower than the TCB racking option.
- The TWC are not stored in the racks because the dimensions don't allow it.
- The TCBs are cheaper, but they are more labor intensive to build compared to the TWCs.
- On average, the weight per TCBs is lower than the TWCs, which means that for the same weight, less boxes are needed when the rubber is packed in the TWCs. Because Store&Ship is paid per box handled, this is a potential reduction in revenues.
- One third of the useful floor space is equipped with racks. This allocation has been set based on the historical volume split between the two grade types, but this split hasn't been stable for the last year. At times there are way more of either type of box present in the warehouse which is very inefficient.



Operational performance

- The warehouse is overfull, which has as result that boxes are stored in the loading zones, the aisles and everywhere there is a gap. This causes additional damages, because forklifts are bumping into boxes. Many boxes are not allocated to a storage zone with the scanner system and can't be found in time to go out on a shipment, which gives them the designation 'lost' in the inventory system. Store&Ship is paid per box on a shipping order, so the more time it takes to do the work (moving, searching, reconditioning), the less profitable.
- The reconditioning is done by Store&Ship at their expense for damage that is done in the warehouse. Store&Ship has currently 4 people dedicated (Full Time Equivalents, FTEs) to recondition damaged boxes. Any box that is damaged by the production plant and comes to the warehouse, is sent back for reconditioning at the plant at Rubber Inc.'s expense.
- Safety is another delicate point. An overfull warehouse, stressed people, difficult handling of boxes in the racks create a dangerous situation where sooner or later accidents will happen. Store&Ship is the employer and is therefore liable for accidents happening to their employees.
- **This part of the case is designed to let the candidate paint a picture of the current situation. His original framework will probably not allow him to solve the problem. Be considerate and have a conversation with the candidate about above mentioned issues to see whether he connects the facts to the poor financial performance. The next part of the case is intended to come up with a solution and implementing it. You can guide the candidate towards the optimal solution in order to get to the part of implementation in time.**



Implementation and Risks and Mitigation

- The implementation of the solution should look like this.
 - Store&Ship will have to document properly how many boxes come in damaged from the plant. The Production Manager will not take this lightly, so caution is recommended to bring this up. Using other contacts, such as the Shipping Manager, Line Supervisor who are aware of the problems, will be a good tactic.
 - When Rubber Inc. understands, based on facts, they are part of the problem, they will ask what to do. Now you can propose to eliminate the TCB type box.
 - Rubber Inc. will reply that this will heavily limit the storage capacity of the plant because of the racks. You can pull up the calculations what the effect of removing the racks will be. Stress that this will reach all goals: less damages and hence less complaints, less scrap, and no reconditioning work anymore.
 - For Store&Ship this will reduce the headcount, reduce the time spent moving things around, and Rubber Inc. will be forced to ship more, produce less, or use overflow warehouses.

Optimization of warehouse

Rubber Inc. is increasing the pressure on Store&Ship to do something about the situation and asks for recommendations on how to turn things around.

Based on what has been discussed already, it is clear that there are a number of actions to be taken. However, the client wants a permanent solution. **A solution needs to increase the safety, reduce costs, and improve operating performance in the sense that the scrap rate and the complaints need to be eliminated.**

Ask the candidate to come up with a set of suggestions on how to reach the above results.

After exploring a couple ideas, show exhibit 2, accompanied of the following background. Store&Ship just wants to get rid of the TCBs all together because they cause so many issues.

TWCs can only be stored on the floor, while TCBs can be stored on the floor and in the racks.

Only the same amount of boxes fit in the floor storage bins, regardless of the type of box.

The average weight for a TCB is 0.8 ton, for a TWC that is 1 ton.

Guide the candidate towards **getting rid of the racks first and eliminate the TCBs as a packaging type second**. This allows for all floor storage space. The candidate should calculate the total ton capacity before and after the two changes.

Benefits are additional flexibility in the warehouse, no damaged boxes anymore, easier operations (no reach trucks for the racks anymore and minus 4 FTE who were reconditioning, and reduced safety risks.

Drawbacks are reduced storage capacity, less boxes to be handled, client will need to change their operations, start using more expensive packaging and ensure that no customer has problems because of the change.

Exhibit 1: March Non-conformity Report

	39xx grades	62xx grades	All grades
Complaints	8	2	10
Boxes with non conformity	255	95	350
- <i>Reconditioned</i>	75	86	161
- <i>Scrapped</i>	180	9	189
Boxes shipped	3744	1280	5024
Boxes per shipment	26	20	

Exhibit 1: March Non conformity report ANSWER KEY –
The underlined numbers are the ones that matter most

	39xx grades	KPIs	62xx grades	KPIs	KPIs All grades
Complaints	8	5.55% (per shipment)	2	3.13% (per shipment)	4.81%
Boxes with non conformity	255	6.8% (per boxes shipped)	95	7.4% (per boxes shipped)	6.97%
- Reconditioned	75		86		
- Scrapped	180	<u>4.8%</u> (per boxes shipped)	9	<u>0.7%</u> (per boxes shipped)	3.76%
Boxes shipped	3744		1280		
Boxes per shipment	26		20		
Shipments	144		64		



Exhibit 2: Warehouse lay out

	Racks (TCBs)	Floor (TWCs)	Total
Sq Ft	25,000	50,000	75,000
Blocks	9	5	14
Boxes per block	720	1008	
Capacity	6480	5040	11520

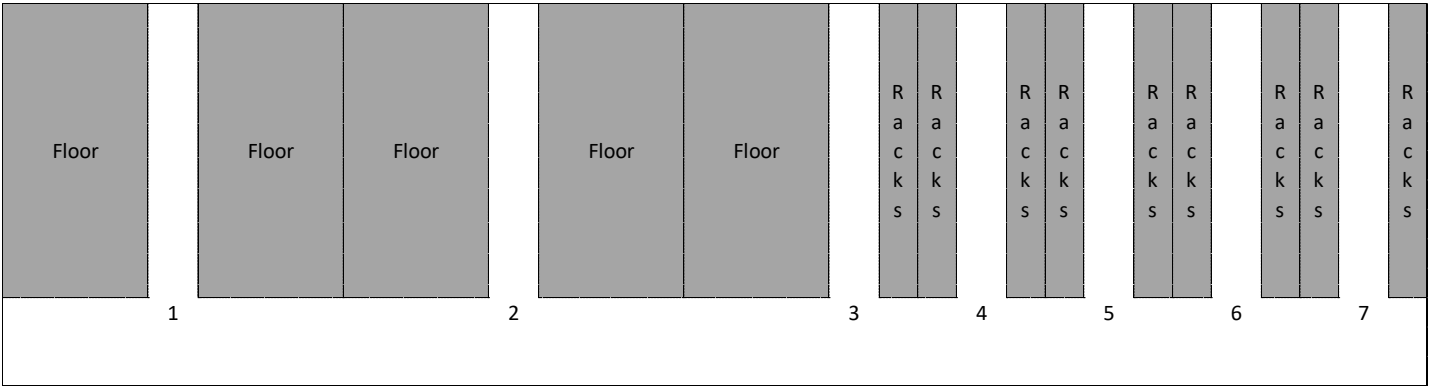


Exhibit 2: Warehouse lay out ANSWER KEY

	Racks (TCBs)	Floor (TWCs)	Total	Proposal - Only floor with TWCs
Sq Ft	25,000	50,000	75,000	75,000
Blocks	9	5	14	8
Boxes per block	720	1008		1008
Capacity	6480	5040	11520	8064
Avg. ton per box	0.8	1		1
Total ton capacity	5184	5040	10224	8064

Written by: Ziheng Zhu (Class of 2016)

Case Type: Operations

Case Basics

Delivery:	Interviewee Led
Company:	BCG
Industry:	Automotive
Concept:	Supply Chain
Difficulty Level:	Hard
Quants:	Medium
Strategic Thinking:	Hard

Note to the Interviewer:

- The candidate may not be able to get to the right conclusion considering that this is a relatively uncommon industry segment. The interviewer will have to nudge the candidate in the right direction.
- The candidate should keep track of progress and follow-up with interviewer to answer all questions
- The candidates should not be given any information unless asked for or if it is absolutely necessary to nudge her in the right direction.

Fit Interview Questions:

- Tell me a time when you took a risk and what was the result of it?
- What do you like the most about your last job?
- What’s your favorite movie?

This is not a company provided case.

Problem Statement:

- Our client is Auto Parts Shop, an large US-based auto parts chain (think Pep Boys). APS carries non-branded auto parts for each category (battery, tire, etc). For these non-branded auto parts, the company signs a preferred supplier. However, the client recently found out that its stores are selling more non-preferred supplies than expected with a \$100M margin gap.
- Our firm was brought in to: 1) understand why this happened, 2) how to recoup some of the loss and 3) what should be the long term strategy

Clarifying Questions (*Answer only if asked*):

- **How does APS operate?:** APS acts as a customer-facing, full-range retailer of **aftermarket auto parts**
- **What is the industry / competitive landscape?:** APS is a major player in the auto parts retail space. Retailers traditionally deal with aftermarket parts, which account for 1/3 of the total auto parts manufacturing (auto parts manufacturing is a complex global supply chain involving Original Equipment (OE) and aftermarket parts).
- **Who are APS's suppliers?:** Vehicle manufactures (Ford, Toyota & etc) and wholesales distributors supplies aftermarket parts:
 - Replacement Parts: replace worn or damaged original equipment parts
 - Accessories: add-on for comfort and/or performance reasons
- **Who is a preferred supplier?:** APS picks preferred suppliers solely on the price that a supplier charges for its parts
- **What is a non-branded auto part?:** Lower price point auto parts without branding (think generic drugs)
- **What is a margin gap?:** the difference between maximum possible profit and actual profit due to either higher cost or lower revenue (Note for interviewer: this case is a cost side issue)
- **Do we have any specific goals?:** No. We want to focus on reasons for the margin gap and recommend a solution.

Part 1: Understand why this happened? (1/2)

- A candidate is likely to start with a profitability structure due to the term “margin gap”. However, the key to solve this case is to understand the current operating procedure during the resupply process.
- A strong candidate will build a comprehensive structure that covers both operations and financial considerations of the company. Since a non-branded parts has similar price point, the candidate should realize that the margin gap is likely from the cost side. This conclusion should lead to discussions around APS’s current operating procedures.
- **Financial**
 - Revenue: Price x Units Sold. A strong candidate should quickly move on to the cost side
 - Costs: A value chain approach will be the most intuitive in this case covering: merchandising, storage, transportation, sales and services
- **Operations:**
 - A strong candidate will emphasize the importance in understanding APS’s operations and cover APS’s capabilities. One way to structure this could be: people, process and technology
 - Another important point of discussion is APS’s supply chain



- **After initial structuring, wait for the candidate to drive the case. If the candidate does not share where to go next, prompt them by asking: “Which area would you focus on first...”**

Part 1: Understand why this happened? (2/2)

- Prompt the candidate to focus on how APS resupplies its inventory. **If candidate ask about how the operations work, share Exhibit 1 with the candidate.**
- A strong candidate will study the exhibit and understand that there are **three channels** for the non-preferred parts to get into the system. Prompt the candidate to size the likelihood of non-preferred auto parts getting sold by calculating the total probability of non-preferred to get sold.
- **Calculation**
 - Online out of stock:
 - $0.9 \times 0.1 = 0.09$ or **9%**
 - Service call out of stock:
 - $0.1 \times 0.6 \times 0.1 = 0.006$ or **0.6%**
 - Service call direct order:
 - $0.1 \times 0.4 = 0.04$ or **4%**

Total probability of non-preferred sold: 13.6%
- **Synthesis (be flexible and ask follow-up questions depending on the candidate's thinking process):**
 - Online is the most common channel for APS to sell non-preferred auto parts
 - Prompt the candidate to brainstorm why would a parts be out of stock?
 - Counter staff is more likely (40%) to order directly from non-preferred vendors, indicating opportunities for training or process standardization
 - Prompt the candidate to brainstorm reasons why counter staff would provide non-preferred parts

Question 2: How to recoup the margin gap

Answer Key

	% of order method		Margin gap	
% of sales	Online	Staff call	Online	Staff call
Tire	$0.2 \times 0.8 = .16$	$0.2 \times 0.2 = .04$	\$16M	\$4M
Battery	$0.05 \times 0.05 = 0.0025$	$0.05 \times 0.95 = 0.0475$	\$250k	\$4.75M
Oil Filter	$0.05 \times 0.1 = 0.005$	$0.05 \times 0.9 = 0.045$	\$500k	\$4.5M
Others	$0.7 \times 0.59 = \sim .42$	$0.7 \times 0.41 = \sim .28$	\$42M	\$28M
			\$58.75M	41.25M

Calculation

Margin Gap per square: % of sales x % of order method x \$100M margin gap

Synthesis

Online can “recover” the most margin gap of the two methods of delivery. Combined with the higher probability of online contributing to non-preferred sales, online seems the better option to focus on.

A strong candidate will consider risk factors and the ease of implementation. If the candidate decides to focus on online, ask her how hard will it be to change an online ordering system

Part 3: What is the long-term strategy

- The interviewer should test the candidate's understanding of what constitute a long-term strategy.
 - A strong candidate will build upon the information provided previously and identify reasons to focus on fixing one delivery method versus another.

	Pros	Cons
Online	• Higher probably of occurrence • Higher margin gap recovery	• Long implementation horizon • Difficult to change • Risking 90% of the resupplying
Staff calls	• Easily implementable through training • Important value of customer facing roles • Highly erroneous process – 40%	• Solve only 10% of the problem • Might require culture shift or new hires

- Ask the candidates what might be a good long-term strategy to prevent this kind of issues in the future
 - Discontinue the preferred supplier program after understanding the cost and benefit of such a program
 - Add additional selection criteria to pick the preferred suppliers
 - Stop carry non-preferred suppliers

The key is to communicate the long-term benefit of a strategy to the client and the business sense in an option

Part 4: Recommendation

- There is no right answer, but rather now the candidate defines and defends the solution
- Situation → Problem Synthesis → Recommended Solution → Next Steps



Exhibit 1: APS resupply process

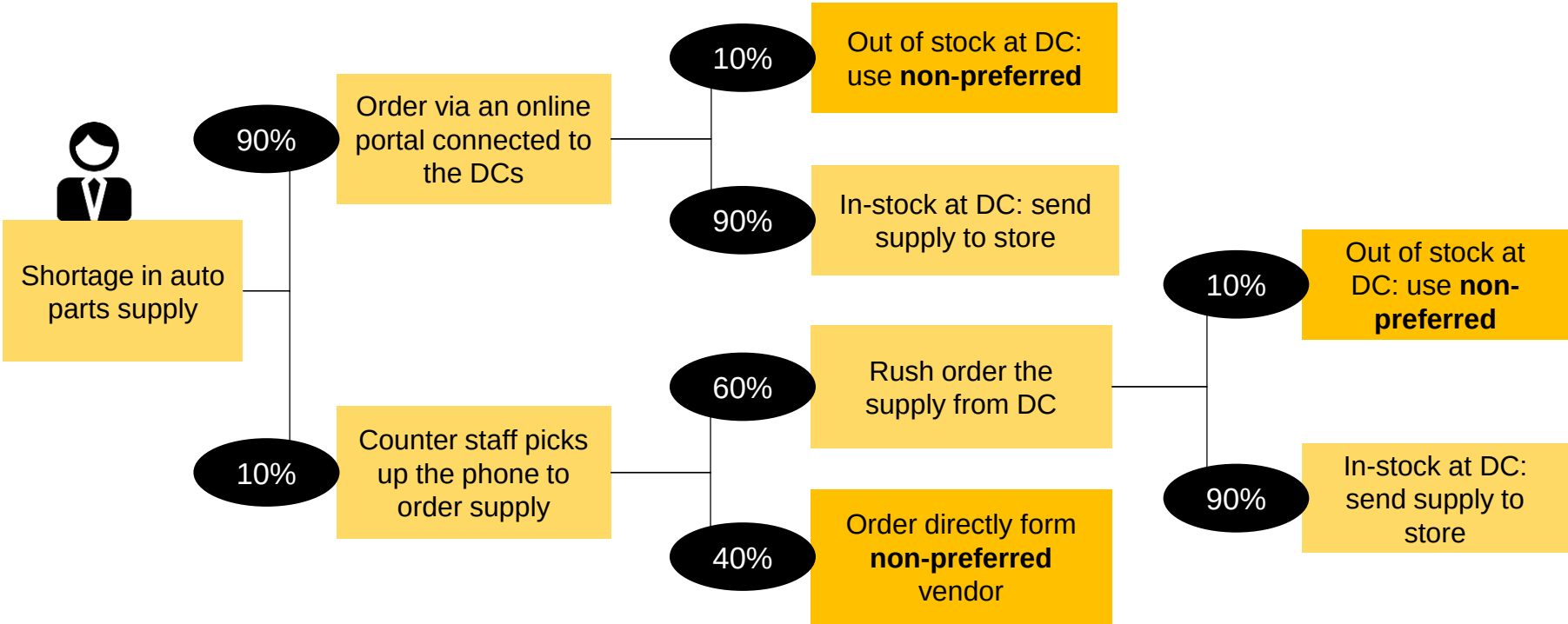
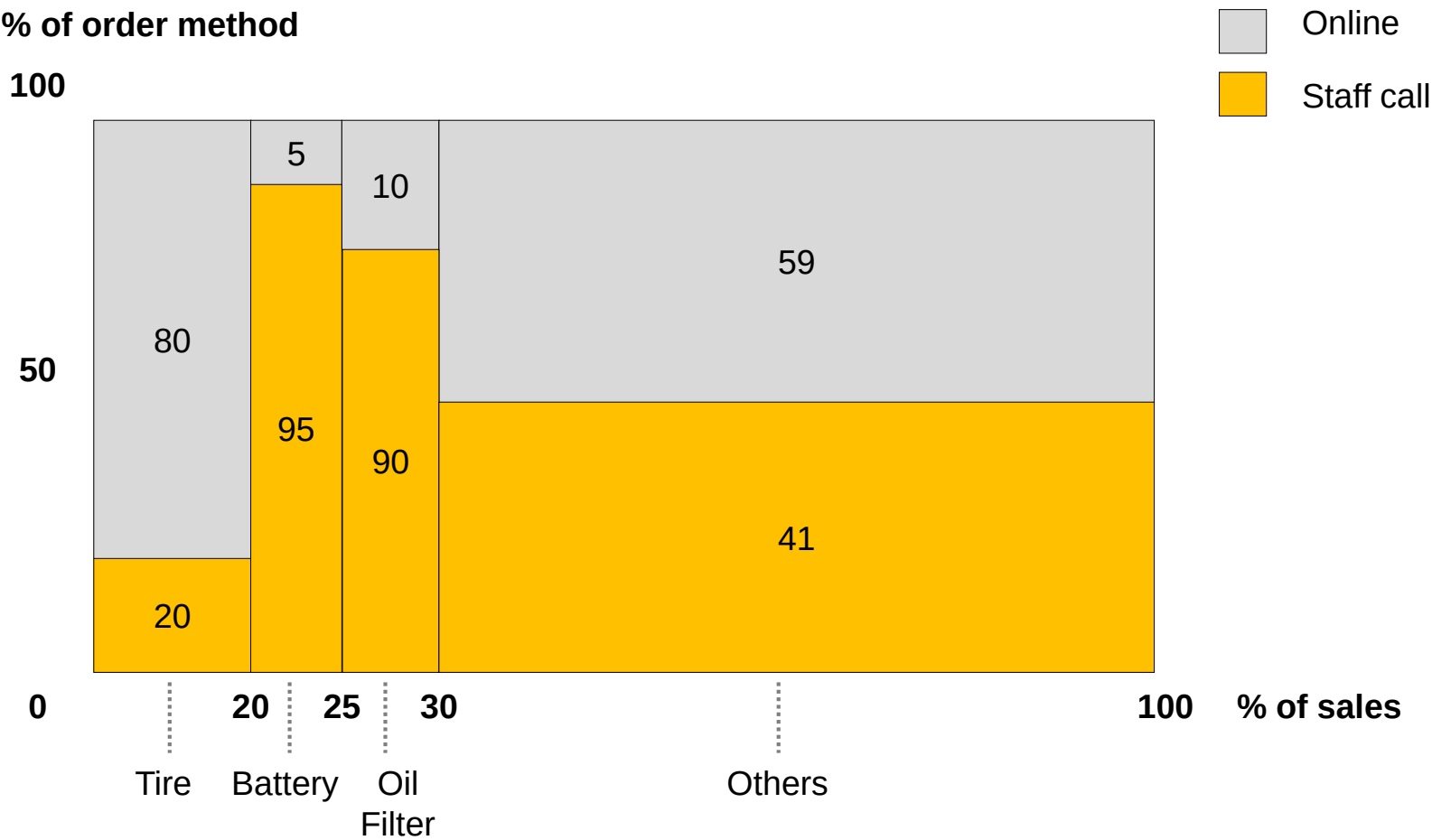


Exhibit 2: Preliminary sources of \$100M margin gap



Written by: Maksim Khaitovich & Christopher Neander (Class of 2018)
Adapted by: Syed Rafay Mahmood (Class of 2019)

Case Type: Market Sizing

Case Basics	
Delivery:	Interviewee Led
Company:	
Industry:	Professional Services
Concept:	Policy Review
Difficulty Level:	Hard
Quants:	Medium
Strategic Thinking:	Hard

Note to the Interviewer:

- This case involves extensive brainstorming to review a policy within a consulting firm
- The case is intended to make the client think about the pros and cons of a policy in a relatively unique scenario

Fit Interview Questions:

- Tell me about the time you first led a team.
- How do you deal with conflict under tight deadlines?

This is not a company provided case.



Problem Statement:

- A policy allowing travel by private jets for partners at the firm is up for review.
- The policy allows partners at the firm to take their private jet to client engagements.
- The scope of the review is to present a recommendation to the management committee of the firm on if the policy should be retained or not, and if retained if any changes should be made.

Clarifying Questions:

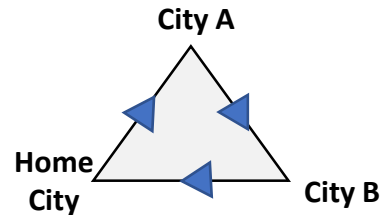
- Reimbursement for flight expenses are limited to the cost of an economy ticket that the practitioner would have had to take if they did not take the private jet.
- Only partners travel on private jets and other practitioners take standard flights.
- Partners fly these private jets as a hobby.
- Average billable rate per partner is \$5,000 per hour.
- Assume full utilization with 50 weeks and 40 hours per week.
- There are 100 partners in the firm and only 5 have private jets (only give this information if directly asked)

Case Structure

- The ideal case structure for this is a “Pro-Con” list. Other case structures are okay but don’t work too well. Most of the case is focused on market sizing.
 - Pros:
 - Save time
 - Less waiting in airports
 - Take flights whenever
 - Hobby; destress
 - Company image (+)
 - More flexibility in travel
 - Cons:
 - Significantly less safe
 - Company image (–)
 - Internal culture may be affected
 - May be more difficult to manage and adds complexity in scheduling
 - Time; may be slower than commercial jets
- The key piece of analysis the candidate needs to do in this case is flight time between a commercial and a private jet flight
 - This will be a key decision factor amongst others

Travel Time Analysis

- Assumptions – these assumptions should be reached as the result of a brief market sizing exercise; standard assumptions are given to make math easier
 - Partners travel to two cities on average per week, so there are three flights in total as they connect through cities



- Average flight time on commercial jets is ~3 hours (2 or 4 is fine too, but math presented is for 3 hours)
 - Commercial jets fly at about 500 miles per hour
 - Private jets fly at $\frac{3}{5}$ x speed of commercial jets
 - On average it takes 1 hour before flight and 30 mins after the flight in the airport for commercial flights. This is down to 15 mins each for private jet flights.
 - On average assume 30 mins travel time for road travel going to major airports. It is down to 15 mins for private jet airfields. Lower traffic on those routes.
- Flight time on commercial jets**
 - 3 hours flight time + 1 hour wait before flight + 0.5 hours wait after landing + $(0.5 \text{ hours} \times 2)$ inter-city travel time = 5.5 hours
- Flight time on private jets**
 - Total flight distance = 500 miles per hour * 3 hours = 1,500 miles
 - Total private jet flight time = 1,500 miles / 300 miles per hour = 5 hours
 - Flight time = 5 hours flight time + 15 mins wait before flight + 15 mins wait after landing + $(15 \text{ mins} \times 2)$ inter-city travel time = 6 hours
- Flight time is only slightly more for private jets than it is for commercial jets

Billable Hours Analysis

- **Ask:** solely based on the analysis of flight times, should the firm disallow flights by private jets?
 - The question is trying to get the candidate think about hours that a practitioner can work while taking flights
- As partners are flying their own private jets, they cannot work while piloting the jets
- On commercial planes, they can work for 3 hours as they fly + 0.5 hour lost as flights on private jets are longer
- Total difference in billable hours:
 - 3 flights per week, with 50 weeks = 150 flights per year
 - Partners do not fly on all flights; assume that they fly 1/3 flights
 - 50 flights with partners piloting
 - Total billable hours lost
 - $3.5 * 50 = 175$ hours
 - Hours lost as percentage of total hours
 - $40 * 50 = 2,000$ hours
 - $175 / 2,000 = 8.75\%$
 - Revenue lost per partner
 - Total potential revenue = $5,000 * 40 * 50 = \$10M$
 - Revenue lost = \$875,000
 - Total revenue lost
 - Total potential revenue = $\$10M * 100$ partners = \$1B
 - Total Revenue lost = $\$875,000 * 5 = \$4,375,000$ (0.4375%)



Recommendation

- The company should keep the policy in place
- Partners are, in general, irreplaceable, even though there is an added cost to the company
- The policy will help partners with stressful job maintain a healthy lifestyle
- Key risks
 - Private jets are significantly more risky than commercial jets – they crash!
 - Image of the firm may be hurt

Written by: Syed Rafay Mahmood (Class of 2019)

Case Type: Profitability & Market Entry

Case Basics	
Delivery:	Interviewee Led
Company:	Bain & Co.
Industry:	Retail
Concept:	Profitability & Market Exit
Difficulty Level:	Hard
Quants:	Easy
Strategic Thinking:	Hard

Note to the Interviewer:
• This case focuses on exploring profitability of a retail chain and operational improvements that can be to improve overall profitability of the retail chain • In the second part the case pushes the candidate to decide if the company should stay in the market or not, as the improvement in profits is not enough to cover losses • Math is not an important part of this case, and it is important to push the candidate on make decisions with little information

Fit Interview Questions:
• Tell me about your favorite project/story from your work experience. • What is your biggest achievement that is not on your resume?

This is not a company provided case.

Problem Statement:

- Our client is “Big Box Retail” an international retail chain. We have been hired to analyze the operations of Big Box in country X.
- Big Box made a loss of 9% (net margin) last year and has been doing so for the last 8 years.
- Owners of the company recently replaced senior management of Big Box in country X and have hired us to see if the company can be turned around to profitability, or if they should exit country X.

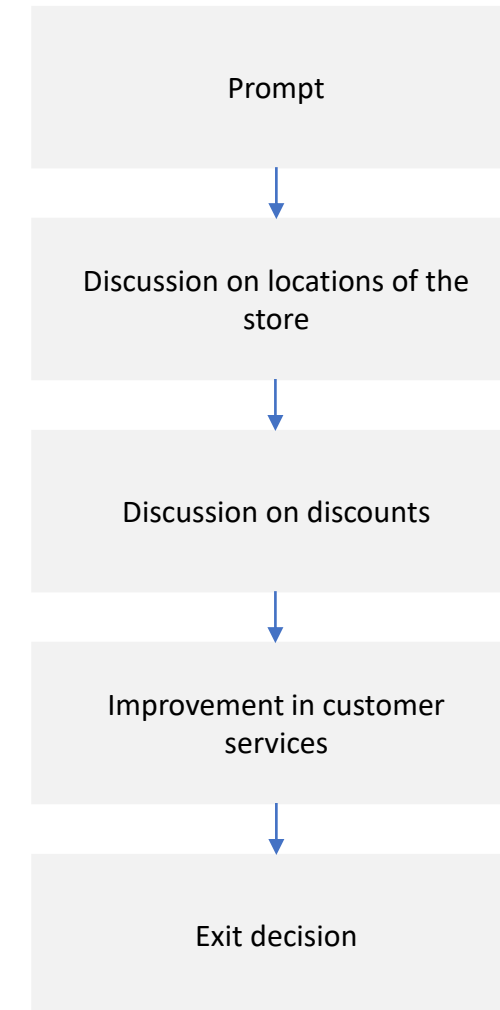
Clarifying Questions:

- GDP of country X is growing at 2.5% per year
- Gross margins in the **industry** is 20%
- Big Box is the **3rd largest player** in the market with a share of **12%**
 - Sahara
 - Market Share = 35%
 - Net Margin = 2%
 - Kalahari
 - Market Share = 18%
 - Net Margin = 1%
- Big Box has a revenue of \$50B overall
- Big Box has **11 stores in country X**
- Big Box’s prices are 5% lower on average than competitors

Recommended Structure

- A profitability tree is the most appropriate structure for this case. The candidate should focus on the following points:
 - Revenue
 - Price
 - Discounts
 - Quantity
 - Product Mix – basket of goods of consumers
 - Overall quantity sold
 - Compared to competitors
 - Comparison by location
 - Costs
 - Fixed Costs
 - Rent of locations
 - Utilities
 - Variable Costs
 - Wages
 - COGS
- The case focuses only on Revenues and decision to exit the market
- There are no opportunities for cost reduction, however, unless the candidate clarifies this, costs should be a part of the structure

Flow of Case

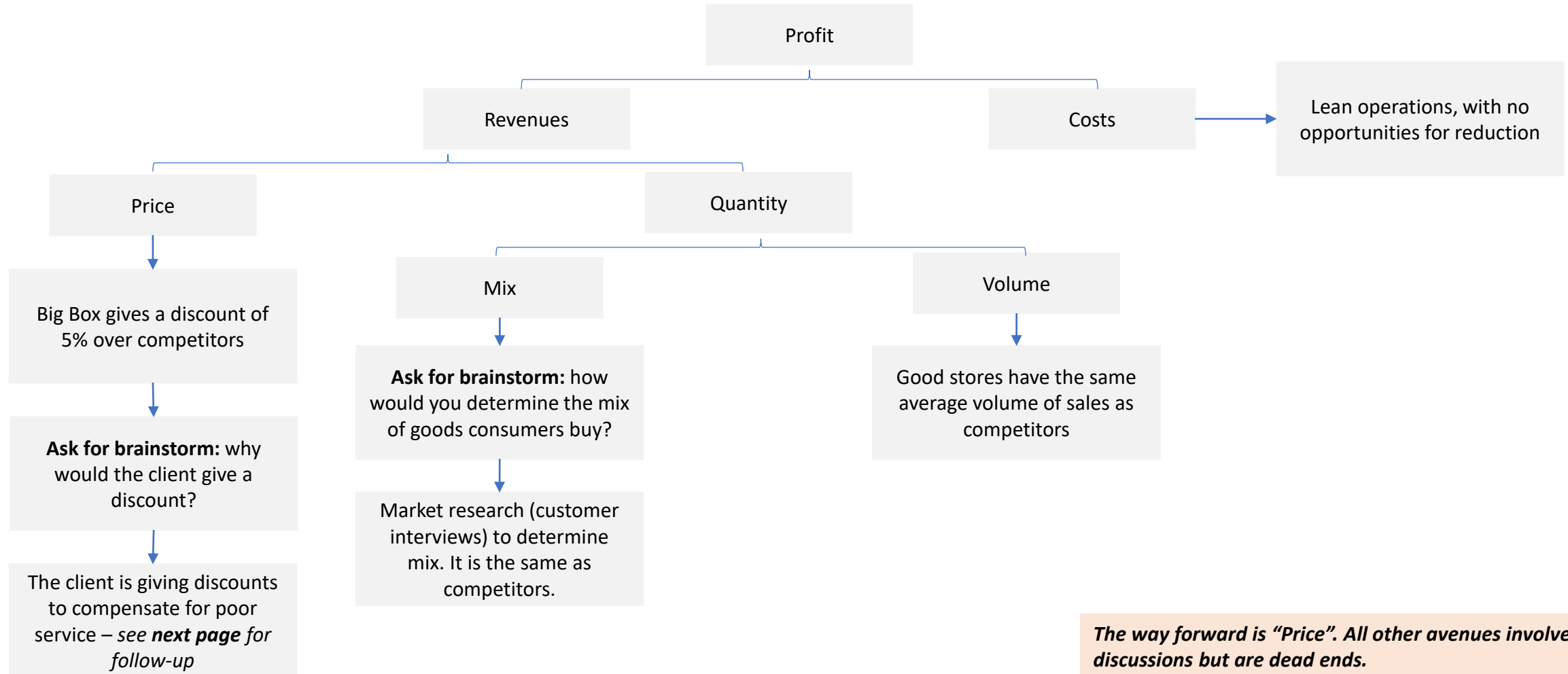


Discussion on Store Locations

1. **Ask:** what are some of the key factors in determining profitability of a retail store?
 - The candidate should use their structure to brainstorm determinants of profitability in retail
 - Guide the candidate to think about the entire chain rather than one store
2. Once the candidate starts thinking about location of stores, **ask:** how would you determine if a store is in a good location or not?
 - The candidate should brainstorm variable that make a location good
 - Acceptable answers include; lookup property prices, benchmark against competitor store locations
3. **Provide** the following information once the candidate provides a good approach for determining what is a good location:
 - There are 4 bad locations with 14% losses (net margin)
 - There are 7 good locations with 6% losses (net margin)
 - **Clarification questions** on differences between locations:
 - The difference between good and bad locations is footfall – this translates into quantity sold
 - Assume that there is no other difference between good and bad stores; prices, basket of goods, service, and layout is all the same
4. **Conclusion:** shut down bad locations
 - Assume that there is no cost to shut down locations (after the first year, the net profit should revert to long-term net profit levels)
 - With this change, the new net profit for the chain will be -7% for the remaining 7 locations

Discussion on Discounts

- Let the candidate drive the case forward – the candidate should use their structure to pick an area to focus on. Guide the candidate as follows:





Discussion on Customer Service

- Guide the candidate as they brainstorm reasons why the client is giving discounts
 - The client is giving discounts to compensate for **poor customer service**
 - Provide the reason if the candidate is not able to get to it on their own
- **Ask for brainstorm:** how can we understand which aspects of customer service are important to customers?
 - The candidate should think about aspects of customer service and what makes service in a retail store good or bad
 - Answers include: market research, customer surveys, in-store interviews, in-store observation, benchmarking with competitors
- After the brainstorm, **provide information** that the customer service issues can be fixed with an investment of \$20M
 - **Ask:** do you think the client should make the investment?
 - There is no further information on revenues and cost
 - Ideally, the candidate should **suggest that Big Box should make the investment and raise prices by 5%**



Discussion on Exit

- **Summarize:** so by closing bad stores we can lower losses to 6%. With improvements in service we can eliminate discounts of 5% and accounting for loss in sales, we can lower losses to 2%.
- **Ask:** do you think Big Box should exit country X?
 - There is no further information available to make this decision
 - If the candidate does not know economic or industry information, provide the information if asked from the clarifications page
- Ideally, the candidate should recommend that the client should stay in country X, as 2% losses are near breakeven
 - With new management and competition 3-4 percentage points away, the client can take over the market
 - The candidate can recommend to leave the country; however, country X is important in the region and will become increasingly important as the economy expands

Recommendation

- The client should stay in country X, as the competition is not too far away and with one misstep by our competition, Big Box is primed to become one of the market leaders
- Big Box should close 4 of its bad stores, as well as invest in making improvements in customer service to reduce discounts

NailedIt! Insulation Fasteners

Written by: Justin McMath (Class of 2017)

Case Type: Market Sizing & Pricing Strategy (Industrial)

Case Basics

Delivery:	Interviewee Led
Company:	Bain
Industry:	Construction
Concept:	Market Sizing & Pricing
Difficulty Level:	Hard
Quants:	Hard
Strategic Thinking:	Hard

Note to the Interviewer:

- NailedIt! Fasteners are new and innovative products in a slow-to-change market. The key element of this case is Pricing Strategy
- Push the candidate to present a plan for gathering and using information. Ask questions such as : “where would you find that?” “What would you do with that information?”
- Includes four (4) exhibits – do not provide until candidate has presented a plan of attack and requested related information.

Fit Interview Questions:

- Which industries do you follow?
- Name a trend that you find especially interesting in one of those industries.
- Pretend I’m a CEO and don’t know anything about that. Take three (3) minutes to give me the basics, explain why its important, and what I should look out for.

This is not a company provided case.



Problem Statement:

- BigManufacturing Co (BM Co.) has created a new technology (NailedIt! Insulation Fasteners) to secure 4x8' sheets of foam or 1x4' sheets of heavy insulation to concrete walls or ceilings.
- BM Co. believes their new product is innovative but is uncertain about the addressable market size or how to price this product. The product is expected to launch soon, and reach full market penetration in 2019.
- You have been hired to size the market for this product from launch in 2016 to maturity in 2019, and recommend a pricing strategy for NailedIt Insulation Fasteners that allows it to capture maximum value.

Clarifying Questions (*Answer only if asked*):

- Recent changes in building codes require more insulation to be used than ever before. Sheets of insulation are now being attached to exterior concrete walls and ceiling. All fastenings must be “mechanical” ie. no glue and no standard has been set for product usage
- The contractors hired to install insulation ultimately decide how it gets installed. Though most materials are budgeted, fasteners are considered incidental and thus are paid out of pocket
- NailedIt! Is a special fastener injection molded around a high strength concrete nail that is fired from a special combustion powered nail driver
- NailedIt! Installs faster than the two alternative fasteners (Stick Pins or Concrete Screws) – Time is money for these guys! (Note: A strong candidate will seek to expand on this point – wait for the formal portion of the case)
- We are only considering the US market for NailedIt!

Question 1: Let's start by sizing the market... How many insulation fasteners will be used in 2019?

- There are multiple avenues to this question. The candidate should provide a well structured approach to size the market. Push the candidate to consider multiple approaches and ask for their thoughts on what could be achievable. Typically one of the following:
 - Number of buildings constructed requiring insulation (Not ideal, highly variable year to year and does not consider existing buildings)
 - Sales of existing solutions (Information unknown)
 - Sales of insulation (This is the preferred solution in this case) ← "Let's go with that"
- Reference Exhibits 1, 2, & 3 – provide exhibits as candidate asks for them
 - **Exhibit 1: Estimated volume of sheet insulation sold in the US (2015)**
 - **Exhibit 2: Survey results: Applications for sheet insulation in building**
 - **Exhibit 3: Typical fastening patterns for sheet insulation and product cost**

Evaluation Commentary

- A strong candidate will identify multiple avenues to market sizing and prioritize based on the ease of implementation and information availability
- The candidates structure must include volume and price. Based on information provided, candidates should anticipate multiple applications (volume determinant) and alternative products (pricing)
- Price is not important at this stage of the case. A strong candidate will complete the volume analysis and then suggest to move on to pricing

Question 1 – Select Calculations

- Note: to speed the case up, ask the candidate to perform the calculations for only one insulation type.

	2015 Volume (M cu Ft)	Thickness (in)	Thickness (Ft)	M Sq Ft (insulation)	Sq-Ft per Sheet	2015 # Sheets (M)	Years to Double (Approx)	2019 Est Volume (M Sheets)	# NailedIt! (Units per Sheet)	Potential Volume (M units)
1x4' Foam Sheet	12	2	1/6	72	4	18	4	36	4	144
4'8' Foam Sheet	320	3	1/4	1,280	32	40	4	80	5	400
1x4' Heavy Sheet	10	4	1/3	30	4	7.5	2	30	4	120

$$[\text{Volume (cu ft)}] / [\text{Thickness (ft)}] / [\text{Sq Ft per Sheet}] \times 4 / [\text{\# Years Doubling}] \times \text{Units/Sheet} = \text{Potential Unit Volume}$$

Insulation	Number Sheets (2019)	Used in Walls & Ceiling	NailedIt! Fasteners (per sheet)	NailedIt! Est. Volume (2019)
1x4' Foam Sheet Insulation	36 M	~90%	4	129.6 M
4x8' Foam Sheet Insulation	80 M	~90%	5	360 M
1x4' Rock Wool (Heavy) Sheet Insulation	30 M	~90%	4	108 M

$$\# \text{ Sheets (2019)} \times [\% \text{ Used in Walls or Ceilings}] \times [\# \text{ Fastenres Per Sheet}] \text{ Approximately } = 600 \text{ M}$$

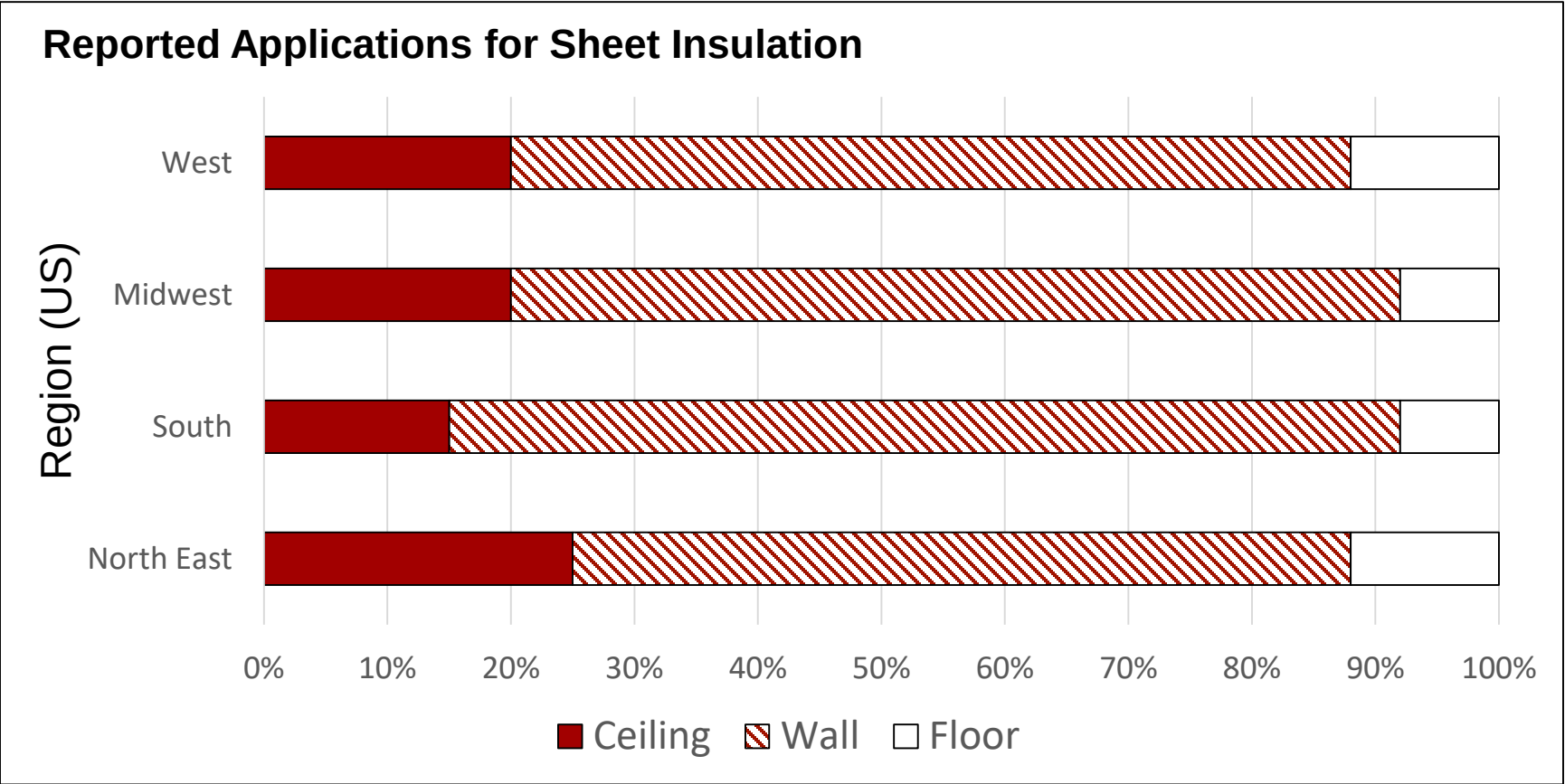
Exhibit 1: Estimated volume of sheet insulation sold in the US (2015)

Insulation	2015 Volume*	Average Thickness (in)	Growth Rate**
1x4' Foam Sheet Insulation	12 M	2	18%
4x8' Foam Sheet Insulation	320 M	3	18%
1x4' Rock Wool (Heavy) Sheet Insulation	10 M	4	36%

* Volume provided in cubic feet (cu ft) of insulation material

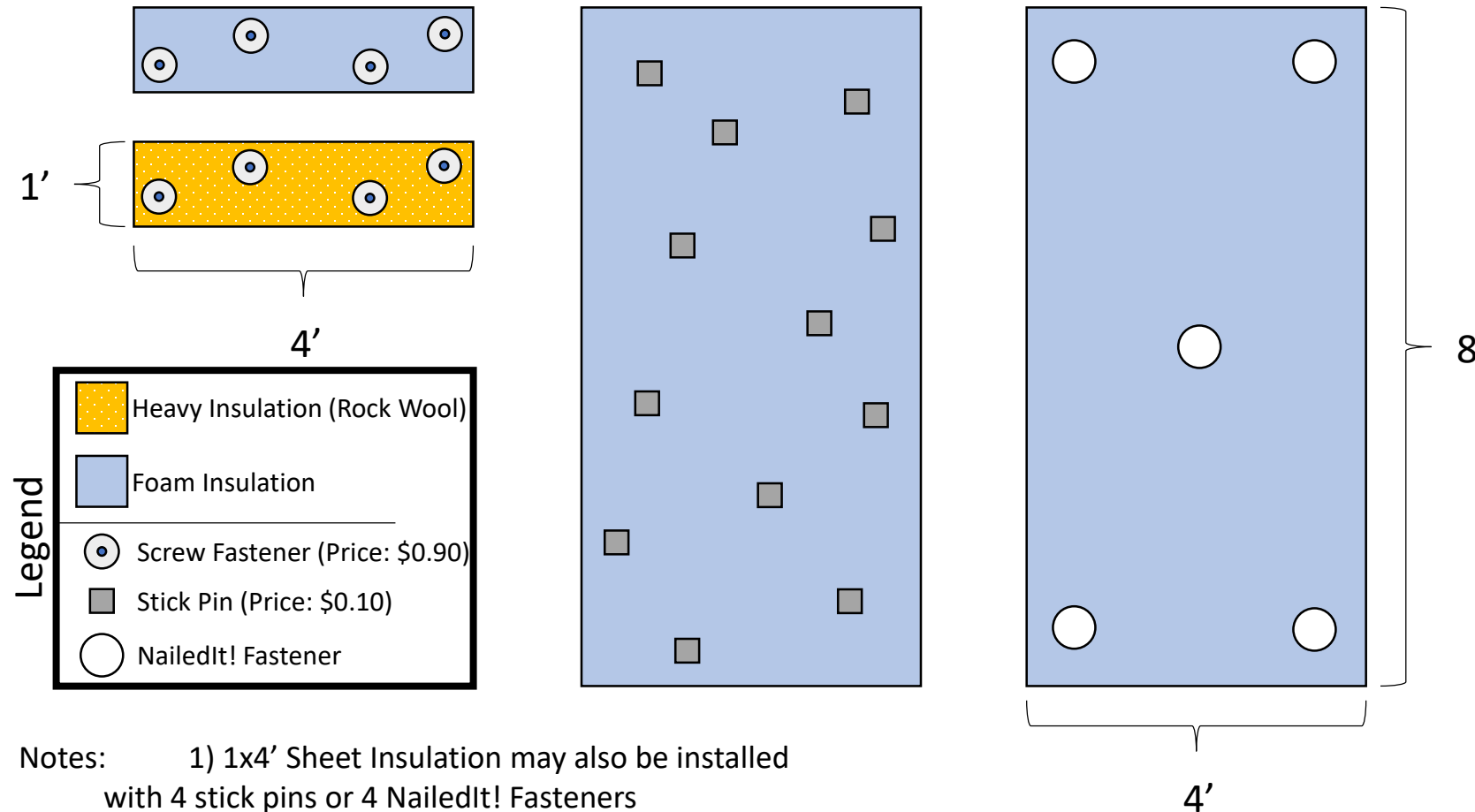
** Compounded Annual Growth Rate (CAGR) from 2016-2026

Exhibit 2: Survey results - Applications for sheet insulation in building



Note: Floor insulation is typically embedded in Concrete and not fastened

Exhibit 3: Typical fastening patterns for sheet insulation and product cost

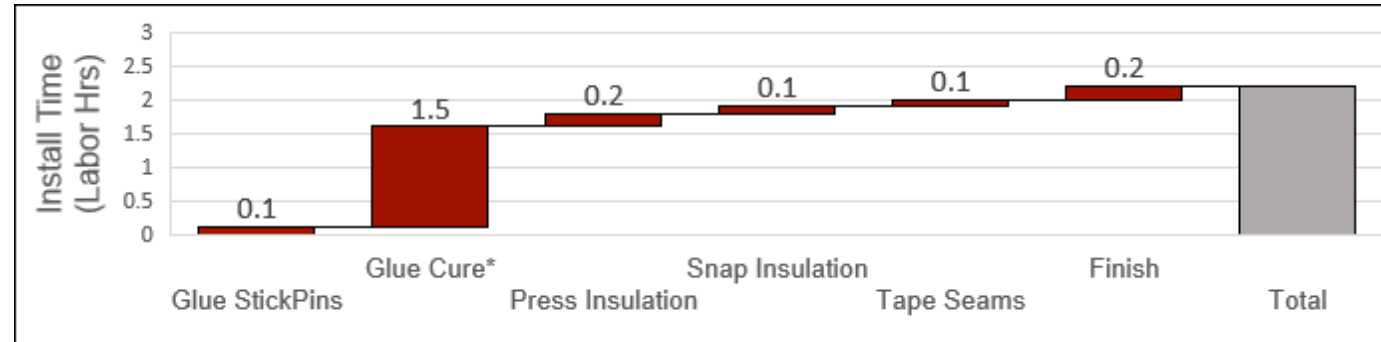


Question 2: Let's talk about pricing – how would you price BMC's NailedIt! product?

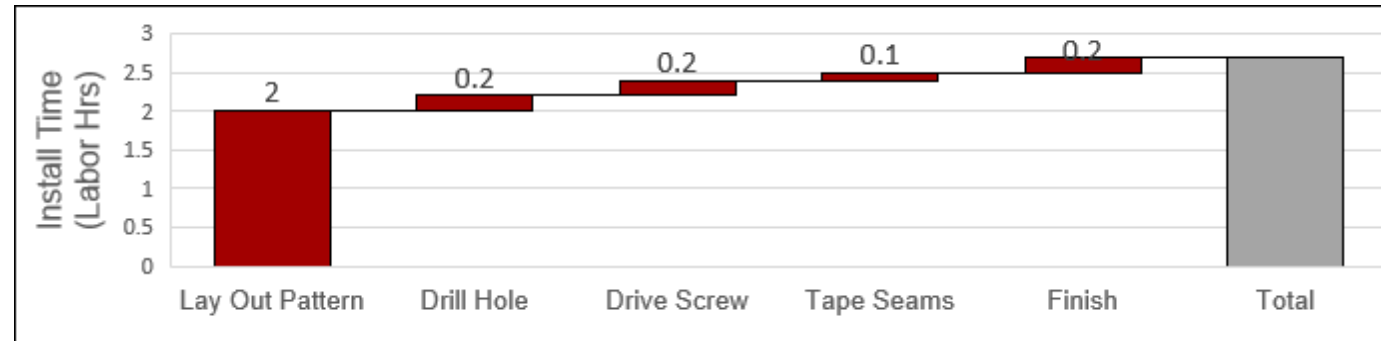
- The candidate should provide a specific hypothesis as to their pricing strategic. Possible pricing strategies including cost plus, competitive, and value based. The preferred solution is value based – a strong candidate will pick up on the cues about innovation and time savings then drive to a value based pricing investigation.
 - Cost Plus – Candidate will seek to understand what the profitability expectations are for the NailedIt!
 - Competitive – Candidate will seek to understand the alternatives solutions (may have been uncovered in Exhibit 3) and price NailedIt! Either below, in-line, or at a premium to the competitive offer
 - Value based – Candidate will recommend learning more about the value created by the product. At this point, candidate should seek more information about the NailedIt! Product. ← Preferred solution
- If necessary, push candidate to think of different strategies until they land on “Value Based” pricing ← “Let's go with that.”
- Candidate should seek additional information to understand how the NailedIt! creates value.
- The following information may provide useful and should be provided after all information has been sought.
 - Different products have different installation processes. The NailedIt! Product installs faster because it uses a nail instead of a screw and requires fewer steps to install. For more information, provide **Exhibit 4**.
 - Labor Rate: When asked about cost of labor, allow candidate to guess. **Suggest an estimate labor rate of \$50/hr for all trades**
- Reference Exhibits – Provide as candidate asks for them
 - **Exhibit 4: Installation Time for Various Insulation Products**

Exhibit 4: Installation Time for Various Insulation Products

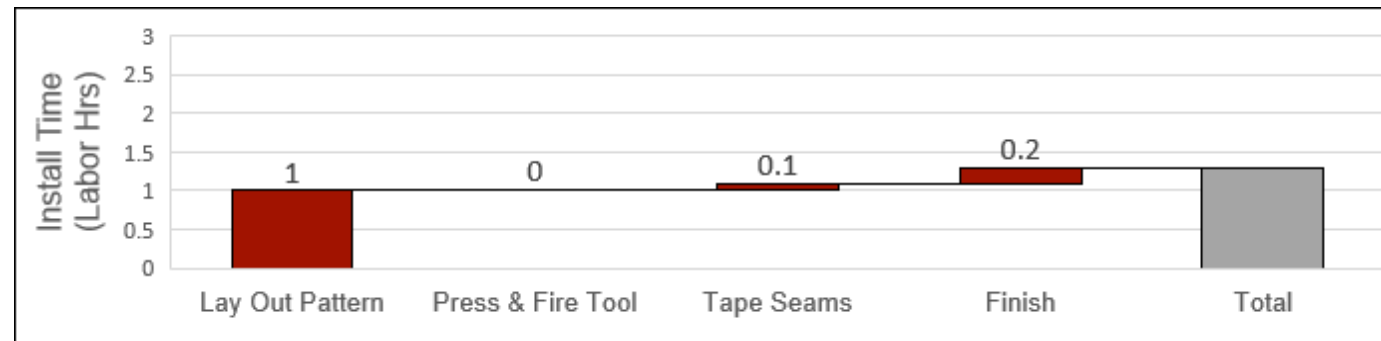
Stick Pins (10 Fasteners)



Screw Fasteners (10 Fasteners)



NailedIt! Fasteners (10 Fasteners)



NailedIt! Insulation Fasteners



Question 2 – Calculate the per unit price to make NailedIt! Installation equivalent to Stick Pins.

	Stick Pins (10 Fastener)		Screw Fasteners (10 Fasteners)		NailedIt! (10 Fasteners)	
	Install Process	Installation Time (Labor Hours)	Install Process	Installation Time (Labor Hours)	Install Process	Installation Time (Labor Hours)
	Glue StickPins	0.1				
	Glue Cure*	1.5	Lay Out Pattern	2		
	Press Insulation	0.2	Drill Hole	0.2	Lay Out Pattern	1
	Snap Insulation	0.1	Drive Screw	0.2	Press & Fire Tool	0
	Tape Seams	0.1	Tape Seams	0.1	Tape Seams	0.1
	Finish	0.2	Finish	0.2	Finish	0.2
	Total	2.2	Total	2.7	Total	1.3
Labor Rate		x		x		x
	/Hr	\$50		\$50		\$50
Labor Cost		\$110		\$135		\$65
Material Cost	# Fasteners	10		10		10
	Cost/Fastener	\$0.10		\$0.90		\$4.60
Total Mat'l Cost		\$1.00		\$9.00		\$46.00
Total Cost in Place (Labor & Material)		\$111.00		\$144.00		\$111.00

A. Calculate by total cost

- 1) Tabulate Total Installed Cost per 10 units (above)
- 2) Select Minimum Cost alternative (Stick Pins). Total cost equal to Total cost of NailedIt! product
 $\$111.00 = \$65 \text{ (labor)} + 10 \times \text{Price/Unit}$
 $\text{Price/Unit} = (\$111 - 65) / 10 = \$46 / 10 = \mathbf{\$4.60 / unit}$

B. Calculate by Incremental Labor

- 1) 2.2 Labor Hrs – 1.3 Labor Hrs = 0.9 Labor Hrs
- 2) 0.9 Labor Hrs x \$50 / Hr = \$45
- 3) NailedIt! saves \$45 in labor per 10 units, \$4.5 per unit
- 4) Add \$0.10 per unit for Stick Pin cost
 Implies **\$4.60 max unit price**

Recommendation: “Let’s wrap this up – our client is coming in tomorrow for an update, what do you think?”

- Candidate should provide a brief overview of the results and analysis, as well as recommendations for next steps.
 - A strong recommendation will include a statement of potential risks to market analysis or product pricing
- After completing the recommendation, probe the candidate about possible problems with pursuing value based pricing. Potential issues include
 - Will contractors be willingness to pay 5x the most expensive product on market?
 - Will special equipment be required to use the NailedIt! Fasteners? Is that common or acceptable?
 - How will BMC promote the NailedIt! System?
 - No mention was made about profitability: How profitable is the NailedIt! at various price points?

Commentary on Candidate Performance

- **Strong performance:** Lead with ‘volume’ as a start for market sizing and provide a clear methodology to seek the required information. After market sizing, candidate will quickly move to pricing strategy and seek to understand how the NailedIt! product creates value for BMC’s customers. Communication is thoughtful and concise.
- **Acceptable performance:** Candidate will struggle to find footing in market sizing or pricing strategy, but not both. With gentle coaching, candidate will identify a path to requested information and provide a comprehensive recommendation.
- **Unacceptable performance:** Candidate “jumps straight in” without considering two-fold objective of the exercise and weak or little structure.

Written by: Derek Jackman (Class of 2018)

Case Type: Non-Profit

Case Basics	
Delivery:	Interviewee Led
Company:	BCG
Industry:	Consumer Goods
Concept:	Market Entry & Profitability
Difficulty Level:	Hard
Quants:	Hard
Strategic Thinking:	Hard

Note to the Interviewer:
• This case examines a straightforward business problem with a non-profit twist. • A strong candidate will notice that maximizing profit shouldn't be the primary strategy of Madataza and will focus on maximizing impact to the citizens of Afghanistan by creating jobs. • An excellent candidate will integrate the company's mission with a sound business strategy. • Trap: emphasizing absolute profits over impact

Fit Interview Questions:
• What do you consider to be your greatest accomplishment? • Tell me about the most creative/off the wall solution you've ever come up with to solve a problem • What do you think is the most challenging aspect of consulting?

This is not a company provided case.

Problem Statement:

- Two entrepreneurs have launched a non-profit spice company called Madataza. Madataza's mission statement is to improve the conditions of people living in Afghanistan by selling saffron to customers in the United States. Madataza is currently exploring setting up sourcing and production operations in three countries—Afghanistan, Greece, and Iran – and would like our firm's help in determining (1) which country they should choose and (2) how they should go about selling saffron in the United States.

Clarifying Questions (*Answer only if asked*):

- **Madataza**
 - No established relationships with any suppliers or distributors.
 - Saffron is made by harvesting the stigmas of crocus flowers and drying them
 - Assume they have “reasonable” access to capital, but still a startup
 - **be careful if they ask about goals of the firm – the goal could be framed as “creating an organization that can best serve Afghan citizens”
- **Afghanistan**
 - Political instability
 - Low corporate governance / high potential for corruption
 - GDP per capital: \$600 USD
 - Arid climate and terrain make traditional agriculture difficult (saffron will grow)
 - High unemployment

Clarifying Questions (continued)

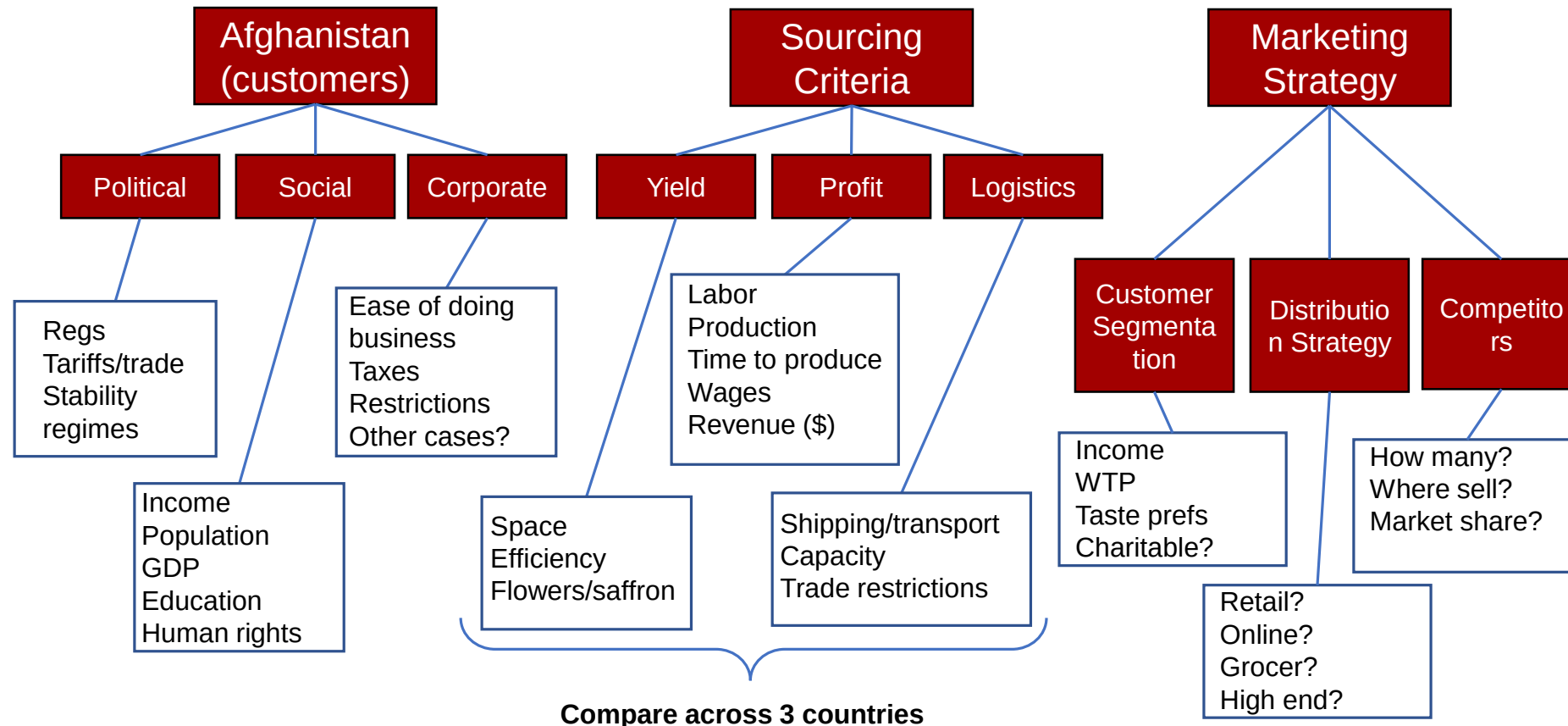
- **US Consumer**
 - WTP for saffron is \$12 per gram on AVERAGE
 - Users in high-end (upscale restaurants, wealthy home cooks, etc.) will pay more (candidate should ask this specifically, don't give it away with WTP).
 - Trend towards more exotic spices being used
- **Competitive set**
 - 5 major suppliers of saffron
 - Sold mostly in grocery stores and higher-end specialty shops.
 - Market is still relatively fragmented
- **Countries (Iran / Greece)**
 - Saffron has been produced in these areas for many years
 - Economies stagnant
 - Political issues

Interviewer guide to a good case

- The candidate should explore some variant of the 3 major areas provided in the sample approach (next page).
- Good insights will cover macro/country factors, insights about the company's mission, sourcing considerations/profit, and insights about the US consumer market. If the candidate has trouble coming up with macro-economic factors, prompt them to brainstorm.
- The sourcing exhibit is largely a quantitative exercise, but a good candidate may make some observations before walking through the calculation (something about productivity, labor efficiency, etc.)
 - *If the candidate prompts to do 1 country first and does it all to your satisfaction, consider giving them revenue and total cost for the other options*
- Allow the candidate to make an incorrect recommendation (s/he might choose Greece because it's the most profitable). Allow them to defend their recommendation beyond just the profit number, regardless of the option chosen. This case illustrates a candidate's ability to make the client situation real. If they miss the non-profit's mission, use it as a teachable moment during feedback.
- The marketing strategy is more open-ended. Suggested strategies are presented in the recommendation section but allow them to be creative here. Ask them to brainstorm approaches if they aren't present in the initial framework.

Sample Approach

A good approach will cover 3 broad areas: The state of Afghanistan/how to best help the citizens (the Afghan citizens are our client's actual customers – US consumers are a means to an end), an exploration of sourcing strategy, and an exploration of marketing/positioning for the US Market. A sample high-level approach is shown below – candidate may go deeper or broader.



Recommendation

A solid recommendation will address the company's mission, the correct sourcing strategy, and a reasonable marketing approach:

- **Source saffron from Afghanistan:** While overall profits are lower than Greece (the distractor), more money is able to benefit Afghan citizens (both profits + total production costs). Qualitatively, providing jobs/sustainable sources of income are better than handouts. The candidate may cite additional qualitative reasons (ease of moving money around, taxes, etc.).
- **Pursue high-end chefs and wealthier home-cooks.** AVERAGE WTP is \$12, but it could be argued that this differs across income segments. Sell the product in gourmet food stores (or whole foods) and/or pursue an e-commerce strategy. E-commerce may be easier for the startup since getting on grocery shelves takes a fair amount of negotiation.

Risks can be numerous, some mentioned may include: political instability, difficulty finding qualified labor, import/logistical issues, yield assumptions, etc.

Good next steps include searching for suitable land/training the workforce and taking action on the recommended marketing strategy.

****This case is based on a company called Rumi Spice – they've found a way to make it more profitable for Afghan farmers to grow saffron instead of opium.****

Exhibit 1: Solution

Costs	Afghanistan		Iran		Greece	
Total Yield (flowers/hectare*available)	70,000,000		60,000,000		50,000,000	
Hours to harvest (total yield*hours to harvest)	280,000		300,000		100,000	
Total Harvest Cost (hours to harvest * \$/hr)	\$ 1,330,000	\$	\$ 2,100,000	\$	\$ 800,000	\$
Total Production Cost (hectare*prod cost)	\$ 40,000,000	\$	\$ 30,000,000	\$	\$ 15,000,000	\$
Total Cost	\$ 41,330,000	\$	\$ 32,100,000	\$	\$ 15,800,000	\$
Revenue						
grams of saffron (total yield/flowers needed)	3,500,000		3,000,000		2,500,000	
Total Revenue (grams * selling price)	\$52,500,000		\$45,000,000		\$37,500,000	
Profits (r-c)	\$ 11,170,000	\$	\$ 12,900,000	\$	\$ 21,700,000	\$
Money contrib to afghanistan	\$ 52,500,000	\$	\$ 12,900,000	\$	\$ 21,700,000	\$

*assume frictionless transaction costs (no tariffs etc, but let the candidate bring that up)

**Note that the insight here is that by producing in Afghanistan, all production costs go to citizens/provide jobs

Exhibit 1: Sourcing Data

	Afghanistan	Iran	Greece
Flowers/hectare	35000	40000	50000
Available hectares	2000	1500	1000
Hours to harvest 1000 flowers	4	5	2
Flowers needed/g saffron	20	20	20
Production cost/hectare	\$20,000	\$20,000	\$20,000
\$ / labor hour	\$4.75	\$7.00	\$8.00
Saffron Price (per gram)	\$15.00	\$15.00	\$15.00