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RETHINKING
THE BOUNDARIES

DUKE
FUQUA
SCHOOL OF BUSINESS

The Duke MBA Consulting Club Casebook 2021 – 2022

October 2021
Edition 2

DMCC 2021-2022 Sponsors

DUKE FUQUA SCHOOL OF BUSINESS

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Welcome Message

Welcome students:

The Duke MBA Consulting Club (DMCC) is proud to present the 2021-2022 DMCC Casebook. This year we have included 17 brand new cases. The objective of this book is to help you prepare for your upcoming consulting case interviews. Case interviews are an integral part of the hiring process for consulting firms. These interviews give you the opportunity to showcase your communication, client, creative and analytical skills to your interviewer. This book was developed to complement the Duke MBA Consulting Roadmap curriculum. We hope that using both will help lead you to success during the upcoming recruiting season.

This casebook could not have been completed without all of the wonderful cases submitted by your classmates. We would also like to thank our friends at other MBA programs for sharing with us their old casebooks to supplement the cases herein.

Note that casing is a journey and a process. While many cases herein follow a prescriptive nature, actual interviews may vary with respect to time, organization and detail. It's important to be adaptable, stay creative and respond to mistakes with a confident and professional demeanor.

We wish you luck with your preparation and would like you to remember that your fellow DMCC members are here to help! Please reach out to anyone on the cabinet if you feel that you are not "cracking the case". Lastly, to the students from other top MBA programs who are using this casebook during their preparation, we warmly welcome you to "Team Fuqua."

Good luck!

Soham Bose

The DMCC 2021 Casebook Team

Acknowledgements

This casebook would not have been possible without the case contributions from the following second year students:

Alisha Pradhan, Alvin Du, Aparna Durvasula, Blair Esbin, Chris Cagle, Eliza Borish, Kate Liu, Kelli Valdez, Kelsey Price, Luke Blackburn, Manali Bankar, Marc Goldner, Margaret Tran, Meghna Sahu, Nabeel Mahmood, Neeha Lingam, Neil Vasudeva, Nick Recka, Olivia Alva, Seve Gaskin, Steven Sypult

Overview, Changes and Notes

- Industry primers were removed and can be referenced in previous casebooks. Given the ever-changing market landscape, candidates should always stay up-to-date with recent events and market trends
- Quantitative and qualitative difficulty were combined into a single case difficulty metric. Experience showed that candidates would overemphasize particular rankings whereas real interviews coalesce both components. Note that expert cases in this book are very difficult and meant to pressure test candidates to be uncomfortable
- Ask the behavioral questions EVERY TIME you give a case! Do not neglect this portion of the interview
- All cases are adaptable. Sample frameworks and brainstorms should be used as baselines to guide thinking. Be creative and leverage personal experience in every case
- For the 2021 academic year, send Soham Bose any comments, corrections or errors found in this casebook
- **HAVE FUN!** Casing is very representative of the day-to-day life as a consultant. Enjoy the casing process, and you'll enjoy your future career.

2021 New Case List

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	Case Name	Industry	Type	Difficulty	Notes
1	Beantown Co.	Insurance	Profitability	Easy	
2	Payments in Panama	Financial Services	M&A	Easy	
3	Grow Baby Grow	Industrial Goods	Growth	Easy	
4	Elm Juice	CPG	Profitability	Easy	
5	The Pill Company	Healthcare	Growth	Medium	
6	Leo vs the Space Invaders	Media	Profitability	Medium	
7	Trouble in Packaging Paradise	Industrial Goods	Profitability	Medium	
8	Papyr Co	Industrial Goods	Profitability	Medium	
9	Stale Chips	CPG	Market Entry	Medium	
10	School Supplies	Education	Strategy	Hard	
11	Fuquan Land	Agriculture	Strategy	Hard	Bain style case
12	OrthoGel	Healthcare	M&A	Hard	BCG style case
13	Evening Nightcap	Media	Growth	Hard	Deloitte style case
14	Changing Winds Under the Sun	Oil & Gas	Strategy	Expert	
15	Entertainment Co	Media	Profitability	Expert	Bain style case
16	Into the Unknown	Healthcare	Growth	Expert	McKinsey style case
17	Shots, shots, shots	Public Sector	Strategy	Expert	McKinsey style case

DMCC casebook team favorites

Note: Cases are ordered in relative difficulty. Comfort with medium and hard cases are representative of interview proficiency. Expert cases are intentionally difficult and meant to stress-test candidates to gain comfort feeling uncomfortable.

Other Classic Cases

Case Name	Learning Goal	Difficulty	Location
Sardine Airlines	Good starter case for starting casing	Entry	Fuqua 18-19
Lactose King	Starter/refresher case with profitability twist	Entry	Fuqua 17-18
Winter Olympics	Organizing math structure	Entry	Kellog 18-19
Duck Island	Clearing exhibits and international market entry	Medium	Fuqua 18-19
Fireproof	Out-of-box thinking for growth strategy	Medium	Darden 18-19
Rubber Bumper	Non-traditional topic with good math	Medium	Darden 18-19
Mapflix	Market sizing & NPV	Medium	Fuqua 18-19
Met with Problems	Human organization case	Medium	Darden 20-21
Health Coaches	Difficult topic requiring math structuring and difficult exhibits	Hard	Kellog 18-19
Zoo Co	Non-traditional case with emphasis on quant	Hard	Kellog 18-19
Great Burger	Mckinsey style case with difficult quant	Hard	Stern 16-17

Case Logs

We recommend keeping a case log to track progress, notes and takeaways to refer back to. It is recommended to use an Excel or Google Sheet that can be easily shared with others. Here's a breakdown of the basic sections of a case log:

- **Name**: Name of the case (ex: Queen Bae)
- **Location**: Casebook or firm that gave the case (ex: Fuqua 20-21)
- **Interviewer**: Name of the person interviewing (ex: Soham Bose)
- **Case Date**: Date case was done (ex: 11/1/2021)
- **Industry**: Market the case focused on (ex: CPG)
- **Type**: The type of case or problem solved (ex: Growth)
- **Notes**: Major feedback from the case
- **Takeaways** (optional): Major learnings or hints from the case to be able to refer back to

Case Dynamics

The makings of a good caser can be summarized in two buckets

Quantitative Capability

Quantitative achievement comes from mastering mental math quickly and accurately. Mistakes will happen, remain calm and talk through your approach. Find a methodology to quickly structure and document numbers. At a minimum, candidates must learn:

- Big number multiplication
- Big number division
- Fractions 1/n until n=15
- Quickly calculate and manipulate 1%, 5%, 10%, 20%, and 50%

Qualitative Capability

Qualitative means creativity. Cases have been repeated tens to hundreds of times. Stay up-to-date on news, markets and trends. Draw on personal experiences as a consumer. Create a persona within the case and imagine how to react. Read the news, listen to podcasts and talk with others. Resources include:

- Wall Street Journal
- New York Times (and newsletters)
- Morning Brew
- Robinhood Snacks

Case Type Checklist

Case Type

- ❑ Profitability
- ❑ Growth Strategy
- ❑ Market Entry
- ❑ Human Capital
- ❑ General Strategy
- ❑ Mergers & Acquisition

Case Industries

- ❑ Retail
- ❑ Consumer
- ❑ Financial Services
- ❑ Healthcare
- ❑ Manufacturing
- ❑ Airlines
- ❑ Oil & Gas
- ❑ Non-Profit
- ❑ Education
- ❑ Public Sector/Government

Beantown Co

Industry:	**Insurance**
Case Type:	**Profitability**
Led by:	**Interviewee**
Case Level:	**Easy**

Behavioral Questions

Question 1:

- Tell me about a time when you worked in a team and had to manage conflict.

Question 2:

- Tell me about your proudest professional accomplishment.

Beantown Co

Prompt #1:

- Beantown Co is a leading US-based property insurance company facing a reduction in profit margin in recent years. They are looking to increase their profitability. How would you begin addressing this?

Case Background:

- Case type: Profitability/M&A
- Background information to be divided into these categories
  - **Client/Company information:** The company is facing losses due to climate change in South Eastern United States
  - **Competition Information:** Fragmented industry with big and small competitors
  - **Industry:** firms are price takers and not price makers
  - **Revenue information:** $10B per year
  - **Financial goal/target:** the goal is to increase profitability

  If asked: insurance companies make money in two ways: (1) collecting more money in premium than they pay in claims; (2) earning interest on their assets held

Framework

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Revenues

- Product
  - New offerings (life, health, car, home)
  - New markets (geographic, age-groups, channels ex: business, personal, etc.)
- Pricing
  - Increase premiums
  - Reduce discounting
  - New bundles

Costs

- Variable
  - Hedge disaster areas
  - Digitize processes
- Fixed
  - Benchmark salary and benefits

Other

- Market dynamics
  - Competitive benchmarking
  - Insurance trends
  - New entrants
- Inorganic growth
  - M&A
  - Joint venture

Drive towards M/A or competition. Be patient with candidate and keep pushing them that x, y, z is a good idea however client cannot achieve it for a reason. This is meant to test candidate patience and finally get to M/A or competition.

Additional Sample Framework

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Organic

- Current Revenue
  - Price x Quantity
- New Products
  - New offerings (life, health, car, home)
- New Customers
  - New Market
  - New Demographics
- Pricing
  - Increase premiums
  - Reduce discounting
  - New bundles
  - Assess competitors pricing

Inorganic

- Joint Venture
  - Additional Revenues from other company
  - Cost synergies
- M&A
  - Anticipated Revenues
  - Cost synergies

Other

- Market dynamics
  - Competitive benchmarking
  - Insurance trends
  - New entrants

Drive towards M/A or competition. Be patient with candidate and keep pushing them that x, y, z is a good idea however client cannot achieve it for a reason. This is meant to test candidate patience and finally get to M/A or competition.

Exhibit #1

Organization	2020 revenue	2020 Operating Income	States of Operation	# of employees
Lizard Insurance Co	$8B	$250M	48 contiguous states	~6,000
Floribama Insurance Co	$2B	$60M	FL, LA, MS, AL	~3,000
Chicaaago Insurance Co	$1B	$40M	OH, IN, IL, IA	~2,000
Beantown Co	$10B	$150M	48 contiguous states	~10,000

Interviewer guidance on Exhibits

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Exhibit #1 Guidance:

- Provide the candidate exhibit #1 and ask for their initial thoughts
- The other insurance companies aren't necessarily competitors but are targets for M&A (let the candidate determine this)
- The number of employees is extra information but helps identify that Lizard Insurance Co is already more efficient and has low synergy potential

Organization	2020 revenue	Operating Income	# of employees	Operating Margin	Income / Employee
Lizard Insurance Co	$8B	$250M	~6,000	=250M/8B = ~3%	250M / 6K = ~$40K
Floribama Insurance Co	$2B	$60M	~3,000	=60M/2B = 3%	60M / 3K = $20K
Chicaaago Insurance Co	$1B	$40M	~2,000	=40M/1B = 4%	40M / 2K = $20K
Beantown Co	$10B	$150M	~10,000	200M/10B = 2%	150M / 10K = $15K

Analysis:

- Candidate should accurately calculate operating margins (provided above) and note that Beantown Co is currently the worst performer (2%) and that the scale of Lizard Insurance Co is likely helping drive a higher margin
- **If the candidate suggests M&A with Lizard**, highlight that at this time Beantown Co does not have the ability to raise the required capital for a full on acquisition the size of Lizard Co.
- **If the candidate suggests Floribama,** their reasoning should include increased operating margin. Potential risk could be increased risk in future in the covered states due to climate change
- **If the candidate suggests Chicaaago,** their reasoning should include highest operating margin and mention potential for synergies since Operating Income per # of employees is low**. Bonus points** if the candidate mentions that the geographical coverage is states with lower natural disaster risk due to climate change

Brainstorming

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Prompt:

- If candidate does not automatically go in to 2nd order insights or next steps/risks, prompt them with “What would additional considerations (or risks) be?”

Analysis:

Any structured brainstorm would work. Risks should be mentioned

- Financial
  - Debt load
  - Change in market considerations
  - Overlapping markets
- Operational
  - Integration
  - Personality conflict

Conclusion

Recommendation

The Board of Directors for Beantown Co is about to meet to determine whether there is a strong enough opportunity to further explore this merger. How do you recommend that they proceed?

Interviewer Guidance:

Recommendation

– Candidate should recommend moving forward with Chicaaago

Risks

– Anti-trust and regulatory issues

– Current regulatory climate

– Management/culture risk

Next Steps

– Announce that agreement is being pursued

– Complete due diligence

– Consider any necessary rebranding

Although most profitability cases do not drive to M/A, this is a good way to be exhaustive during the framework and may be seen in interviews

Payments in Panama

Industry:	Financial Services
Case Type:	M&A
Led by:	Interviewee
Case Level:	Easy

Behavioral Questions

Question 1:

Tell me about a time when you had to give a team member critical feedback. How did you approach the situation? What would you do differently?

Question 2:

What’s the hardest feedback you’ve received? How did you take it?

Payments in Panama

DUKE FUQUA SCHOOL OF BUSINESS

Prompt #1:

- During your weekly game of pickleball with the CEO of Puerto Pay, a Puerto Rican payments processor, she mentions that she's thinking of expanding her company's footprint and has been looking to acquire Telepay, a competitor based in Panama. She knows of your stellar reputation as a consultant and asks for you to determine whether or not she should acquire Telepay.

Case Background:

- Industry information:
  - Telepay and Puerto Pay are both Payment Processing companies. Payments processors are technology companies that facilitate transactions between customers, merchants, and banks and collect fees for facilitating these transactions
- Puerto Pay information:
  - GOAL: Puerto Pay had profits of $625MM in 2020 and is looking to increase profit in 2021 post-acquisition to $645MM, including the cost of buying Telepay
  - The CEO of Puerto Pay does not want to spend more than $500MM on acquiring Telepay
- Telepay information:
  - Telepay has over 85% of market share in Panama so you can consider them to have a monopoly on the payments processing space in Panama (that is, Telepay generates 100% of the revenues of the Payment Processing market in Panama.)
  - Puerto Pay and Telepay have no overlapping customers.
- Product information:
  - Both Puerto Pay and Telepay have the same product: Point-of-Sale (POS) systems. POS systems allow merchants to charge customers for transactions made in-store (think of the Square/Clover/Toast machines when you buy coffee)

Payments in Panama

Framework Buckets (Go/No-Go with Internal/External twist):

This can be presented as a GO/NO-GO. The interviewee should summarize the scenario that would lead to "go" and what information would be required to determine go/no-go

<u>Internal/Puerto Pay Considerations</u>

- Deal financing
  - Cash
  - Debt
  - Stock
- Synergies & Cost-cutting
  - Employee redundancies
  - IT/infrastructure consolidation
  - Facilities consolidation
  - Tax implications
- Other
  - Branding
  - Knowledge transfer
  - Culture

<u>External/Telepay Considerations</u>

- Company
  - Profitability
    - Revenue
    - Costs
  - Products
  - Customers
    - Demographics
    - Loyalty and Reputation
    - Trends
- Panama Market
  - Growth rates
  - New competition?
    - Domestic
    - International
  - Macro-economic trends affecting the payment processing space in Panama

Drive towards Central America payment processing market

Payments in Panama

Framework Buckets (Go/No-Go with Internal/External twist):

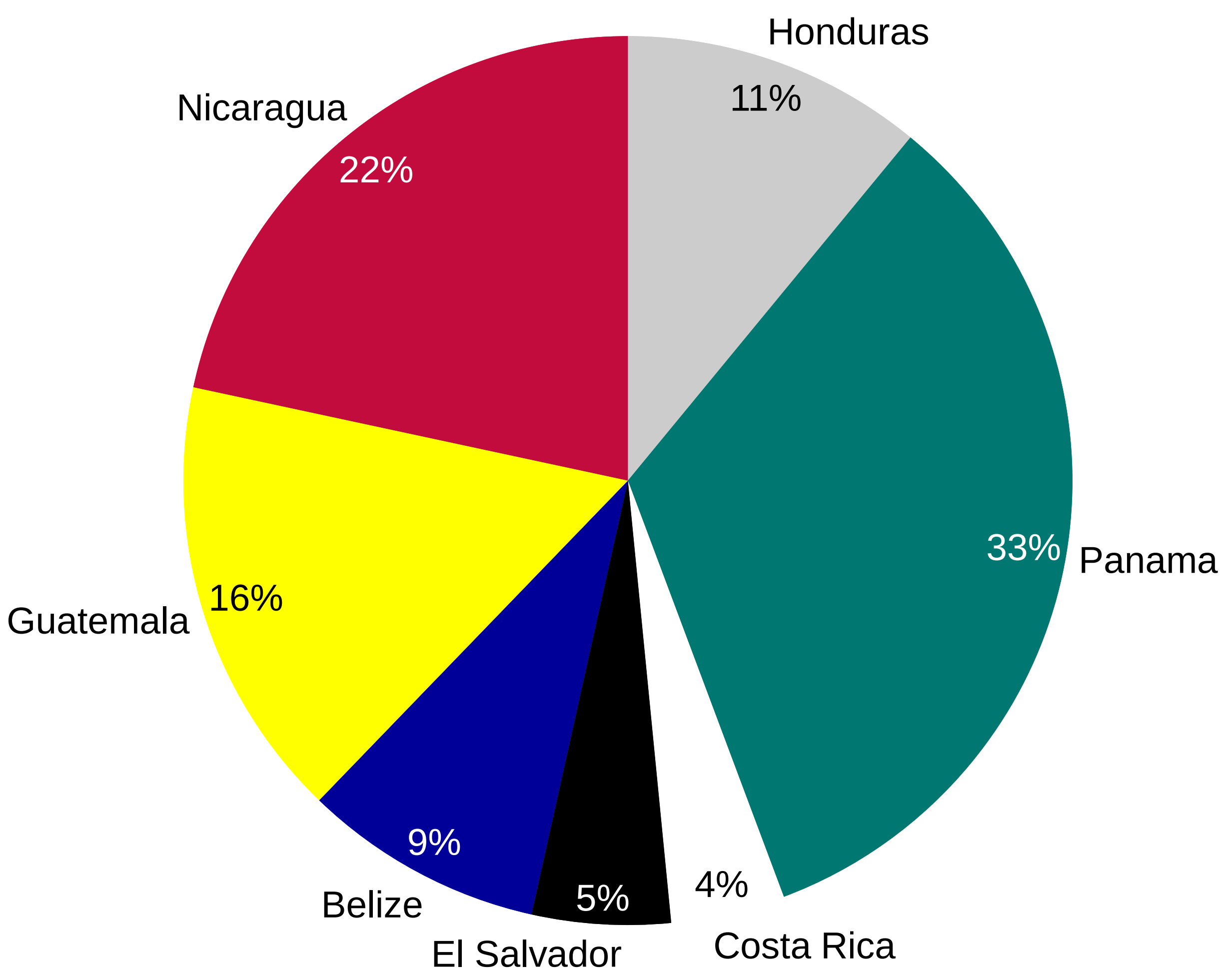
Telepay Syngergies
- Size
  - Customer footprint
  - Revenue
- Revenue streams
  - Communication Synergies
  - Price
  - Cross/sell
  - Fee structures
- Cost structure
  - Savings
  - Bundle
- Upfront control / premium
  - NPV
  - Financing

Puerto Pay Fit
- Physical capital
- Human capital
- SG&A
- Customer overlap

Risk
- Integration
  - Company culture
  - Talent leaves
- Losing customers
- Regulations
- Quality

Exhibit #1

Central American Payment Processing Market by Country (in Revenue, in $MM)



Interviewer guidance on Exhibit #1

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Exhibit #1 Guidance:

- This exhibit shows how much each country in Central America makes up of the larger Central American payments processing market. It is meant to be indirect and intended to push the candidate to ask more questions about the target company that may not have been asked originally.
- **When asked - the total size (in revenue) of the Central American market is $681MM**.
- Additionally, the candidate can inquire about how much of the Panama market Telepay owns to get a sense of Telepay's revenue figures. In this case, Telepay owns 90% of the market, and the remaining 10% is fragmented among a handful of competitors.
- Once the candidate calculates Telepay's revenue, provide them with the following and ask them to assess what they think about the acquisition cost:
  - Acquisition cost: EV – Net Debt * Control premium = ($400M) * 120% = $480M = cost to acquire

Analysis:

Basic

- Once the candidate has figured out about the overall size of the Central American market and Telepay's share of the Panama market, they should calculate Telepay's revenues:
  - Therefore, Telepay's revenues are 33% (panama market) * 90% (Telepay share) * $681MM (market size) = $202M
  - Can approximate 30% of 680M as (700M x 0.3) – (20M x 0.3) = (600M x 0.3) + (80M x.0.3) = 204M
- Once the candidate has calculated Telepay's revenues, they should drive the case towards determining cost in order to ultimately find profitability figures

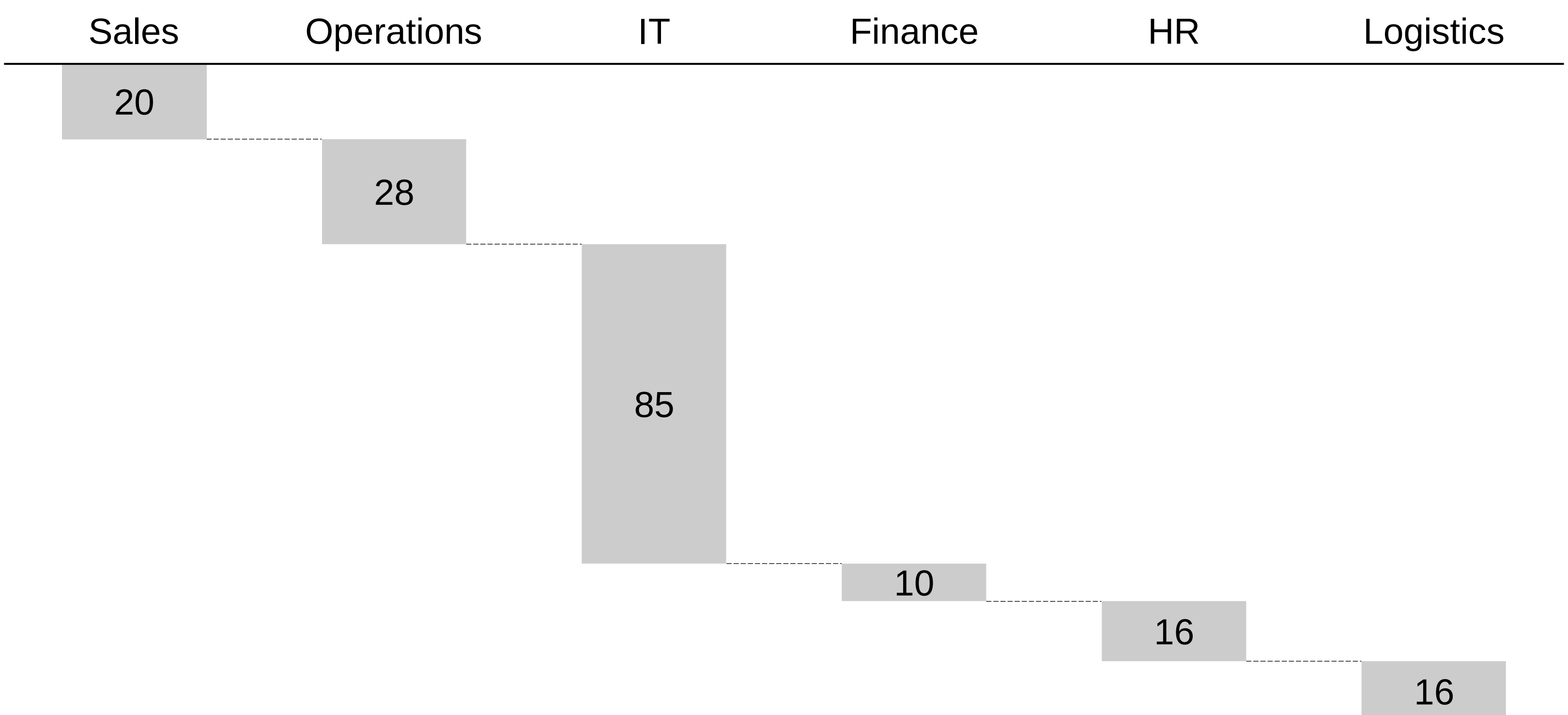
Second order insights

- The candidate should consider implications of Exhibit #1:
  - Will there be regulatory issues if Telepay is effectively a monopoly?
  - How much more will Telepay be able to grow if it already owns a heavy majority of the market? Is the payment processing market overall growing?

Drive towards costs

Exhibit #2

Telepay Costs by Department (in $MM)



Payments in Panama

Prompt #2:

- You receive this chart breaking down Telepay's costs by department and immediately recognize IT spend is a significant portion of total costs. When you ask the client for information regarding these costs, she gives you the following notes:
  - Telepay spends $85MM on server racks annually (noted in chart), which affords the company 68 server racks
  - The company keeps 24,000 terabytes of data active in the data center
  - Each server rack can hold 500 terabytes of data

Interviewer guidance on Exhibit #2

Exhibit #2 Guidance:

- Exhibit #2 gives a breakdown of Telepay's costs by department, and Prompt #2 breaks down those costs. When asked provide
  - The IT spend goes towards hosting and maintaining 68 servers. Each server costs $1.25M
  - Client has 24,000 terabytes of data
  - Each server stores 500 terabytes

Given this, the candidate should deduce that the company is paying for 20 server racks that it doesn't need, totally $25MM that can be saved

Analysis:

Calculations (exact)

- 24,000 / 500 = 48 servers needed
- 68 – 48 = 20 servers are being wasted
- 20 x 1.25 (5/4) = $25M in savings

Basic

- The candidate should understand that Telepay has more servers than are necessary for it's business and that Telepay can cut down on costs by getting rid of these servers, or Puerto Pay can save money by getting rid of these post-acquisition.

Second order insights

- A good candidate will calculate the amount of money saved by getting rid of these servers and understand that the company can save $25MM by getting rid of these unused servers

Payments in Panama

Recommendation

As you're out getting coffee, you run into the CEO of Puerto Pay, who asks you for an update on the acquisition work.

Risks and Next Steps:

The candidate should recommend that Puerto Pay move forward with the acquisition of Telepay and highlight the following points:

- Telepay's profit for 2020 was $52MM
- Telepay can cut down on costs within the IT department by $25MM
- Factoring in cost of acquiring Telepay for $480MM, Puerto Pay will be able to increase it's overall profits to over $702MM, which exceeds the target that the client was looking for

The candidate should also highlight the following risks:

- Legal/regulatory (regarding anti-competition)
- Hard for Telepay to grow with so much market share

Grow baby, grow!

Industry:	Industrial Goods
Case Type:	Growth
Led by:	Interviewee
Case Level:	Easy

Behavioral Questions

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Question 1:
Tell me about yourself

Question 2:
Tell me about a time you've failed and what you learned from that experience

Grow baby, grow!

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Prompt #1:

Your client is a diversified industrials distributor that focuses on four key product areas: plumbing tools (pipes, installation tools), lumber residential products (siding, framing materials, roofing), cement (raw cement powder, ready-to-use cement, mixing tools, etc.) and paper products (cardboard, writing paper, packaging paper, etc.). The client distributes finished products to a variety of customers, such as property management companies, residential home builders and contractor plumbers. Your client currently faces an issue of bottom-line growth. We have been engaged to study how our client can increase their EBITDA margin over the next 5 years.

Case Background:

- Client operates only in the USA, does not want to expand internationally
- Client has many competitors and operates in a fragmented industry, only owns 10% of market share
- Current strategy: acquire smaller, competing distributors that have a good synergistic fit
- Does not manufacture but serves as an intermediary, aka a distributor, to distribute products to end-customers
- Achieved revenues of $15B and EBITDA margin of 8% in 2020
- Target EBITDA margin of 10% on whatever revenue by 2025
- Client’s board of directors wants the CEO and her leadership team to focus improving EBITDA – find ways to grow

Grow baby, grow!

Framework Buckets:

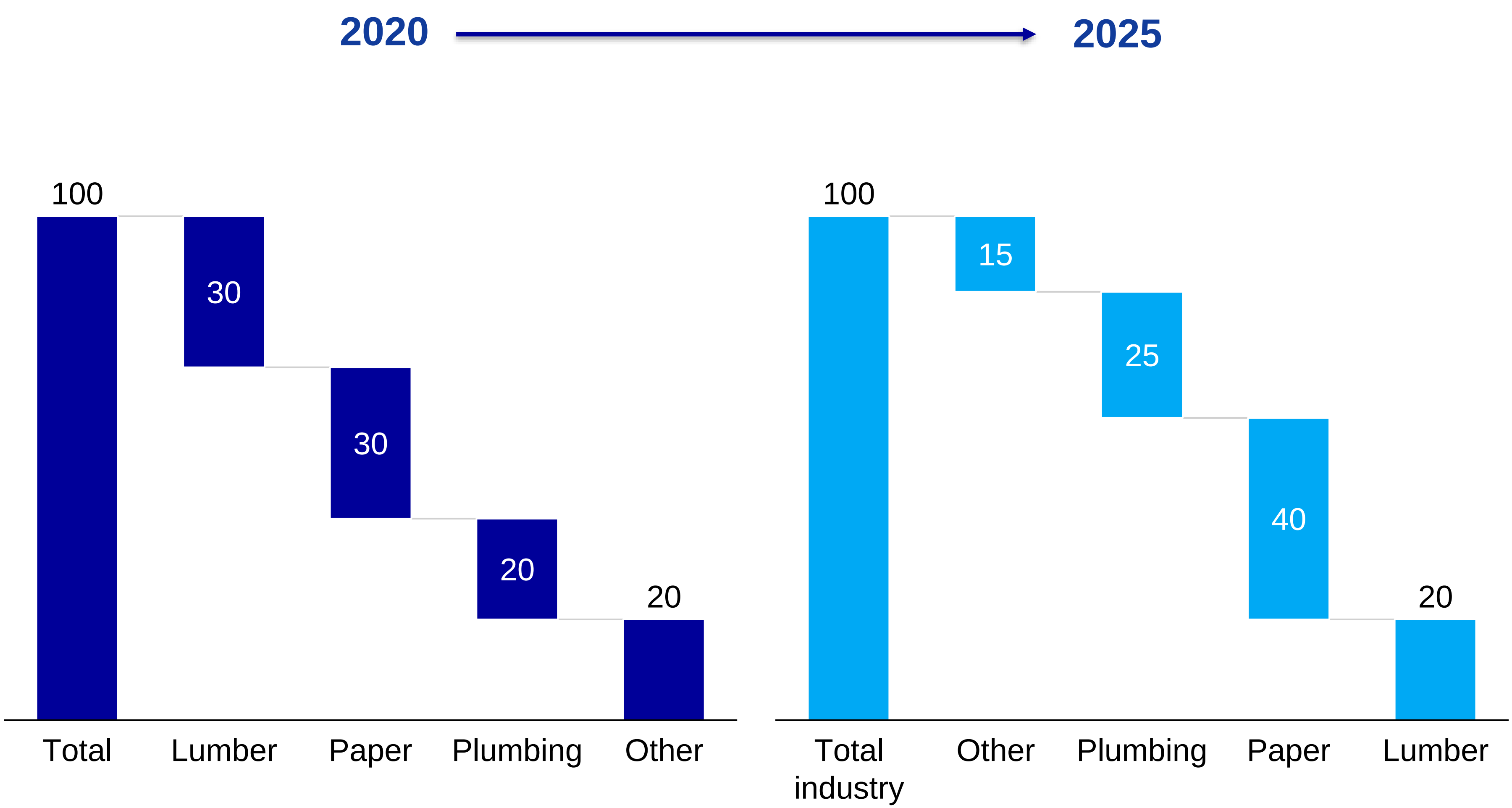
Basic framework should include driving towards core product expansion. Direct candidate toward core product expansion if they don't focus/mention it

- Core product expansion
  - Market analysis of each product
    - Current markets served, competitor scan, CAGR
- Additional opportunities
  - Value added services
    - Offer install services, provide a digital tool for on-demand ordering and tracking, rent out tools/equipment, etc.
  - New product categories to expand into – decking/fencing materials, flooring, cement, anything else that's creative from candidate
  - Expand backward in the value chain
    - Acquire a manufacturer of product categories, e.g. acquire a plumbing supplies manufacturer or paper pulp facility
- Risks
  - Supplier risks
  - Channel conflict
  - Volatility
  - Fit with the company – human capital, mgmt. risk, etc.
  - External factors, e.g. recession, construction down-turn, lack of raw materials access, etc.

Drive towards market growth trends

Exhibit #1

Projected market growth of entire construction materials space (USA-only, %)



Interviewer guidance on Exhibits

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Exhibit #1 Guidance:

- Candidate should calculate the 5-year growth rate, e.g. paper-based products increase growth by ~33% over 5-years
- Candidate should identify that paper-based and plumbing products are best to deep-dive next
- Candidate should note that the axis are ordered in reverse order between the two when clearing

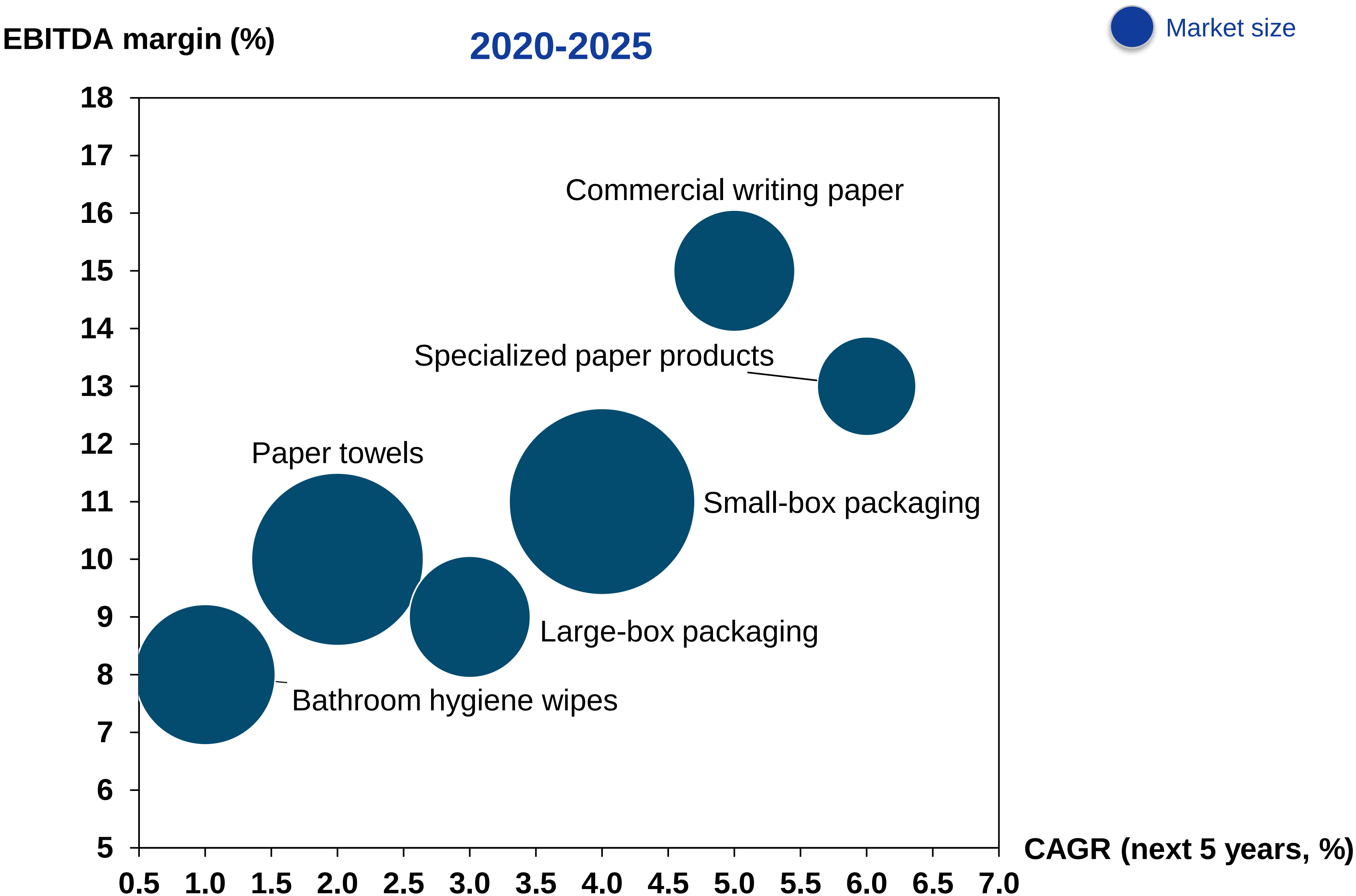
Analysis:

- Analysis for the exhibit to have 2 parts –
  - Verbal math – quick calculation of % change of each product category over 5 years, but a strong candidate would focus on the biggest positive % change ones first, so – paper, plumbing, other and lumber
    - Lumber: (20-30)/30 = -33%
    - Paper (40-30)/30 = +33%
    - Plumbing (25-20)/20 = +25%
    - Other (15-20)/20 = -25%
  - Basic
    - Paper-based and plumbing supplies and tools appear to have strongest 5-year projected growth rate
    - Avoid lumber-based products
  - Second order insights
    - Gives input on why markets are growing or shrinking
    - Would be curious to know what the EBITDA margins are for these product categories (relates back to the main goal of the client)

Drive towards EBIDTA margin and growth within paper-based products

Exhibit #2

Paper-based products EBITDA margins (USA-only)



Interviewer guidance on Exhibits

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Exhibit #2 Guidance:

- Commercial writing paper = notebooks, printing paper to corporate offices
- Specialized paper products = greeting cards, ornamental paper products
- Small-box packaging = paper for pharmaceutical packaging
- Large-box packaging = paper for cardboard boxes
- Bathroom hygiene wipes = bath tissue, napkins, sanitation wipes
- Paper towels = kitchen-based paper products, e.g. paper towels

Analysis:

- No math required
- Analysis for the exhibit to have 2 parts –
  - Basic
    - Commercial paper products has greatest EBITDA margin growth
    - Specialized = greatest CAGR
    - Bathroom hygiene wipes should be avoided low CAGR
  - Second order insights
    - Depends how risk-averse the client is – Commercial paper products might have greatest EBITDA margin growth, but would they be able to acquire/merge with a competitor? How many players are in this sub-product category?
    - Small-box packages presents an opportunity depending on how fragmented/consolidated the space is
    - Commercial paper products satisfies the client's main goal of improving EBITDA margin
    - Would be interested to learn the size of the market and key players to see if acquisition if possible of smaller players to reach the EBITDA margin goal

Brainstorming

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Prompt:

- What should the client consider while expanding into the paper products space? Specifically, what are some possible advantages and disadvantages of this expansion strategy?

Analysis:

- Generally frame as opportunities and challenges:
  - Paper products industry, specifically commercial writing products, can help expand into commercial space, e.g. restaurants/bars/clubs, office spaces, etc.
  - Capacity to expand abroad since paper products are global
  - Can acquire a local paper mill to manufacture and distribute
- Challenges/risks:
  - We don't have the management expertise in some global areas – how does China do business versus our current market in the US?

Grow baby, grow!

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Recommendation

- Continue to focus on the "core products" specifically expand within the paper products space with 10% overall growth trajectory in the coming 5 years
- Possible additional recommendation elements can also include: Focus on operational excellence to improve EBITDA (reduce operational costs for example), stay "near to core products / don't expand into new products"

Risks and Next Steps:

- Risks (non-exhaustive): repeat some of them from brainstorm
- Next steps (non-exhaustive): Identify which sub-product category in paper-based products could be most impactful to increase EBITDA by assessing the key players in the market

This industry is very niche which will often happen in interviews. This requires creative thinking and adapting to uncertainty

Elm Juice Co

Industry:	**Consumer Goods**
Case Type:	**Profitability**
Led by:	**Interviewee**
Case Level:	**Easy**

Behavioral Questions

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Question 1:
• Tell me about a time when you dealt with ambiguity in a decision-making process.

Question 2:
• Describe the ideal leader.

Elm Juice Co

Prompt #1:

- Elm Juice Co is a leading fruit juice company with several leading brands in its portfolio. Our client is a large international private equity firm looking to expand its food and beverage (F&B) portfolio in North America. How would you begin thinking about this deal? What initial risks come to mind? (Candidate should brainstorm risks before developing framework)

Case Background:

- If asked–
  - Client/Company information: Elm's portfolio consists of fruit juices and operates primarily in North America; Client is an international PE firm that only focuses on F&B sector.
  - Industry/Competition information: There is a general health trend away from sugary beverages. Elm's portfolio currently has various products with refined sugar. The company is currently experimenting with an all-natural juice formula that will offer a "no added sugar" option to consumers. Elm is the industry leader and the risk from competition comes mainly in the form of smaller, up-and-coming brands.
  - Product information: Fruit juices -- leading product is Elm's orange juice.
  - Value Chain/Revenue information: $30M; expected revenue growth 40% for Year 1, 16.67% for Year 2, and 14.29% for Year 3
  - Any constraints on the case: Client needs a margin of >=60% by year 3

This case asks for risks up-front and is meant to rattle interviewee a bit. Not all firms will follow prescriptive nature of cases so it's important to remain adaptable.

Elm Juice Co | Brainstorm

Prompt:

- **Ask the candidate to brainstorm some risks before they begin developing their framework**
- After risks have been brainstormed, ask "How would you evaluate the deal?"
  - This should be the framework

Analysis:

- High level structure of the brainstorming
  - Internal / External
  - 3Cs
- External:
  - Trend towards healthier beverages (zero sugar, energy drinks, zero preservatives)
  - COVID-related supply chain issues and tighter discretionary spending
- Internal
  - Strength of R&D
  - Employee morale / buy-in
  - Employee productivity
  - Condition of equipment – will new investments have to be made and the cost impact of those
  - Company culture clashes / integration

Elm Juice Co

DUKE FUQUA SCHOOL OF BUSINESS

Framework Buckets:

- Standalone Cost
- Expected Revenue
- Synergies
- Market Factors / Risks

Drive towards targets operational costs

Elm Juice Co

Additional Sample Framework:

- **Financial**
  - Cost of Acquisition
  - Future Profits:
    - Price
    - Quantity
    - Mix: Products, Customers
  - Cost:
    - FC
    - VC
  - Financing:
    - Debt
    - Equity
    - Cash
- **Non-Financial**
  - Synergies:
    - Sales, Logistics, Products, R&D
    - Regulation
    - Culture: Management, Brand, Employees
    - Market: Demographic trends, industry trends, product trends

Drive towards targets operational costs

Elm Juice Co

Additional Sample Framework:

- Client capabilities (PE)
  - Financial health (leverage, balance)
  - Complimentary portfolios
  - Cost saving drivers (buying power, volume discount)
- Target capabilities
  - Revenue (Bottles sold x $/bottle; repeat customers)
  - Costs (SG&A, manufacturing, lease payments)
  - Operations (geographic regions, customer segment, etc.)
- Market trends
  - Competitors
  - Regulatory / geopolitical trends

Drive towards targets operational costs

Exhibit #1

Cost (Actual & Forecast)

Cost ($M)	Baseline (A)	Year 1 (FC)	Year 2 (FC)	Year 3 (FC)
Cost of material	9	7	5	5
Warehousing and Distribution	4	3	2	2
Sales	7	5	4	4
General and Administrative	5	2	2	2

Interviewer guidance on Exhibit 1

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Exhibit #1 Guidance:

- If candidate has not already asked about the revenue projections, push to get them to ask for it:
  - Baseline: $30M;
  - Y1 – 40% growth [hint: 2/5] (+12M to 42M)
  - Y2 – 16.67% growth [hint: = 1/6]
    - Can round to 17% if candidate does not identify the fraction (i.e., 42*1.17 = 49.14)
    - Total is 49M
  - Y3 – 14.29% growth [hint = 1/7]
    - Can round up or down to 14% - 15% if candidate does not identify the fraction.
    - Total Y3 Revenue = 56M
- From there, they should be able to calculate the margin in Year 3 to determine whether this investment meets the client's criterion.
- Recall client target margin >60% by year 3

Analysis:

- Basic
  - Candidate should identify the cost synergies for Year 1 through Year 3 post-acquisition
  - Candidate should be able to briefly talk about the business reason for the cost synergies e.g., the already existing CPG companies in the client's portfolio, scale synergies (supply chain, procurement, warehousing), etc.
- Second order insights
  - If candidate had asked earlier about the revenue and projections were provided by the interviewer, they should be able to calculate the revenue for Year 1 through 3 along with cost totals to determine margin in Year 3
    - Revenue (Y1) 30+(2/5)*30 = 42M (margin ~50%)
    - Revenue (Y2) 42+(1/6)*42 = 49M (margin ~75%)
    - Revenue (Y3) 49+(1/7)*49 = 56M (margin ~77%)
  - Using the revenue calculated, the candidate should then calculate the margin for Year 3 to determine if it meets the client's criterion
    - Good candidates will recognize that the objective in question only applies to year 3 and would calculate the total cost for that year alone while explaining the rationale for doing so; however, they will still identify the cost synergies and speak to the business reason for those.

Additional Brainstorms

Great candidates should recognize 70-80% margin on juice is improbable and probe reasons why. Similarly great candidates will offer rationale on why growth rates are so high or costs are able to be cut.

Pressure test candidates to think creatively around evaluating the deal

Potential questions:

1. What other considerations are needed for the deal? (3 C's)
2. How could the firm maximize value of the firm? (Operations, portfolio synergies, etc.)

Conclusion

DUKE FUQUA SCHOOL OF BUSINESS

Recommendation

- Since the deal meets the client's criterion (Margin >=60%), the client should go ahead with the transaction.
- There are cost synergies to be realized and the target can leverage its strong brand to introduce healthier options to consumers and stamp out competition from smaller upstarts.

Risks and Next Steps:

Potential risks:

- Risk 1: Robustness of supply chain and impact of macro issues
  - Impact of COVID on global supply chains
- Risk 2: Employee buy-in
  - Maintaining R&D strength and innovation alive within the company
- Risk 3: Cultural risks
  - Acquiring PE firm is international and cultural differences can be potentially counterproductive

Next Steps:

- Initiate operational due diligence process to ID running costs and any other upfront investments that will be needed
- Set up project plan to maximize value on Day 1

The Pill Company

Industry:	**Healthcare**
Case Type:	**Growth**
Led by:	**Interviewer**
Case Level:	**Medium**

Behavioral Questions

Question 1:

- Discuss your most difficult ethical decision and how you arrived at a conclusion.

Question 2:

- Tell me about a time when you had to reconcile being right with being a good teammate.

The Pill Company

Prompt #1:

- Your client is a multinational pharmaceutical company. The client has a portfolio of drugs for major disease areas, including cancer, cardiovascular, and gastrointestinal diseases. The client has experienced a **decline in revenue** over the last 18 months, and is fearful of further declines, especially given that its most commercially successful drug, which treats acid reflux, a gastrointestinal disease, will be going off patent in the next year. What are the areas they should investigate to change the course of this trend?

Case Background (provide if prompted):

- Geography: Multinational company (stated in first line); can think of PillCo. like a GSK or AZ that operates around the world
- Product Mix: Current disease areas includes Neuroscience, Respiratory, Gastrointestinal, and Cardiovascular
- Each disease area includes a portfolio of drug products
- Business model: like that of a typical large pharmaceutical company producing brand name drugs from in-house R&D to a commercial sales teams that sell through typical channels with doctors needing to prescribe the drug
- Competition: Generic companies will be new competitors

The Pill Company

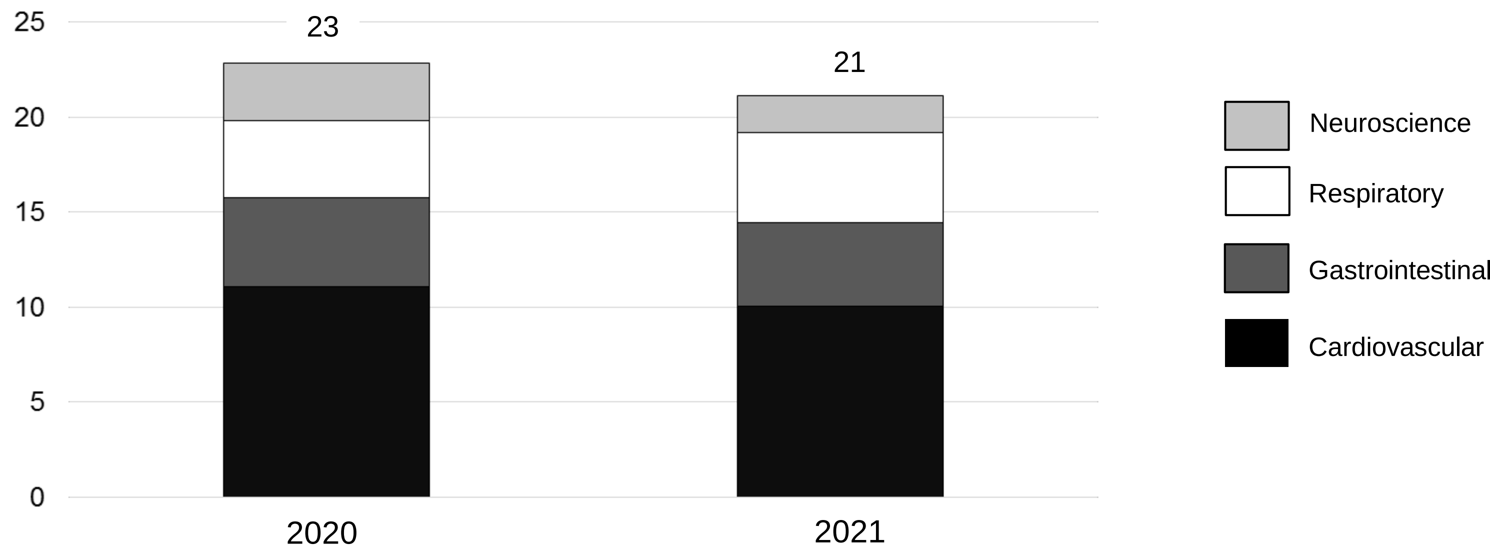
Framework Buckets:

- The candidate should come up with a MECE framework that covers the following areas: **product mix, market (industry trends & competitors), how to grow (build, buy, partner)**
  - The candidate should identify that this is **a revenue problem**, given the prompt.
  - A good candidate will identify the **patent expiration impact** on revenues quickly.
  - A good candidate may also discuss **sales by region** (since it is a global company) in addition to product mix.
  - Additional information should be provided upon request:
    - Exhibit 1 Revenues by disease area (Product Mix)

Drive towards revenue mix by disease area

Exhibit 1

Company Revenues by Disease Area (in $B)



Drug	Disease Area	% of Total 2021 Revenue[1]	YOY % Change Revenue	Market Share
Green Pill	Neuroscience	8%	-33%	↓
Blue Pill	Respiratory	14%	+10%	↑
Purple Pill	Gastrointestinal	15%	-10%	↓
Red Pill	Cardiovascular	22%	-10%	Steady

Note: 1. Each drug does not make up the whole portion of Revenue by Disease Area

Interviewer guidance on Exhibits

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Exhibit #1 Guidance:

- Give the candidate 20-30 seconds to review the chart. Then, prompt them to start sharing insights. Examples:
  - Overall business is declining ~10%, driven by neuroscience, and cardiovascular & oncology
  - Respiratory is driving growth, driven by the blue pill; has also gained market share
- **Ask: Which drug is the largest source of dollar declines from 2020 to 2021?**
  - Allow candidate to round the following:
    - 2021 revenue from $21B to $20B
    - % of 2021 revenues accordingly
  - No need to calculate blue pill since it's a positive % change

Math:

Key Formula: new/old - 1 = % change

2021 Rev / 2020 Rev = 1 - % decline → 2021 Rev / (1 - % decline) = **2020 Rev**

	1.) Calculate 2021 Rev	2.) Calculate 2020 Rev	3.) $ Decline = 2020 Rev - 2021 Rev
Green Pill	$20B * 10% = **2B**	2B / (1-(1/3) = **3B**	3B - 2B = **1B**
Purple Pill	$20B * 15% = **3B**	3B / (1-(1/10) = 3 1/3B = **3.33B**	3.33B - 3B = **0.33B**
Red Pill	$20B * 20% = **4B**	4B / (1-(1/10) = 4 4/9B = **4.44B**	4.44B - 4B = **0.44B**

Green Pill is the largest source of dollar declines at $1B

Brainstorming

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Prompt:

- **Ask: What are some issues that could have caused this decline?**

- Additional information to be provided as confirmation:
- In addition to other issues, the decline is attributed to the introduction of generics in the US and other established markets. It's fair to attribute 50% of the decline to generics. The additional declines were related to Medicaid liability and other inventory related issues.

- Continue with prompt on next page…

Analysis:

- Acceptable answers: lower price, lower tablet sales volume, generics coming on market, regulatory restrictions, out of stocks, changing payer mix, currency, geographic trends, new competitors
- Good candidates will connect generics coming on market to reduced market share in Exhibit 1.

Additional Analysis (Math)

Prompt

- Given these issues with the Green Pill, the client would like your help to determine specifically how to maintain as much revenue as possible from the Purple Pill when it goes off patent next year. It has 2 options that it would like for you to evaluate.
- Options: 1.) Do nothing; 2.) License
  1. **Do nothing**: Green Pill lost 1/3 of volume annually to generic; assume same for Purple Pill
  2. **License:** License the brand to an over the counter (OTC) manufacturer for $1B one-time revenue, but 50% of Purple Pill volume transfers to OTC brand; similar annual volume decline with Option 1 of 1/3
  – State when prompted: Current revenue per pill is $1 at a 75% margin; revenue $3B rounded
- **Ask: What is the gross profit for the next 2 years? Which option would you choose and why?**

Analysis

- Math *(use rounded $3B Purple Pill revenue, but do not round anything else)*
  1. Do nothing: $3B x 2/3 retained (1/3% lost) = **$2B revenue** x 75% margin = **$1.5B gross profit**
     Year 2: $2B revenue x 2/3 retained (1/3% lost) = **$4/3B revenue % 75% margin = $1B gross profit**
  2. License: $1B + $1.5B do nothing gross profit / 2 (50% volume loss) = **$1.75B gross profit**

	Year 1 (2022)	Year 2 (2023)	Total
Do Nothing	1.5	1	**2.5B**
License	1.75	0.5	**2.25B**

The Pill Company

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Recommendation

- The head of The Pill Company is coming up the elevator and needs to make a decision quickly based on our analysis and recommendation.

Risks and Next Steps:

- The math is important, but more important is that the candidate can think through short-term and long term scenarios. For example, licensing may look good in year one and retain the brand, but it is a long-term loss as incremental revenue decreases more rapidly. You would want there to be little to no cannibalization.
- This case gauges the candidates' comfort with making assumptions and making strategic decisions.

Leo vs. The Space Invaders

Industry:	**Media**
Case Type:	**Profitability**
Led by:	**Interviewee**
Case Level:	**Medium**

Behavioral Questions

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Question 1:

- Why are you interested in consulting?

Question 2:

- Give me an example of a time you worked in a team that was not cohesive, and what did you do to improve the situation?

Leo vs. The Space Invaders

Prompt #1:

Your client is a production studio looking to release it's new film, Leo vs. The Space Invaders, in the next year. The film is the fifth movie in the franchise, and the studio is deciding whether to sell exclusive rights to a 3rd party streaming service or stick with the original plan and release the film in theaters. How would you advise the CEO?

Case Background:

- Background information to be provided when candidate asks.
- Company:
  - American film studio that has released several blockbusters in the Leo franchise.
  - The first three movies made over $200M each in the box office, but the fourth finished with only $50M in revenue due to a global pandemic.
- Market:
  - Only focused on the U.S. market for this release.
  - It is currently 2021.
  - Theaters are opening back up after a global pandemic. Some people may be hesitant to go, but many are excited to get back out to the cinema.
  - There were 5,000 theaters in the U.S. as of 2019.
  - There are 15 main streaming services, and the one with the most subscribers is offering to buy the film.
- Financials
  - The 3rd party streaming service is offering $150M for exclusive streaming rights of the film.
  - A strong candidate will also ask about future DVD sales or purchased downloads post-film release, but we are more concerned about the short-term profitability.
  - If the candidate asks about costs, say that we'll discuss those later.

Leo vs. The Space Invaders

DUKE FUQUA SCHOOL OF BUSINESS

Framework Buckets:

Revenue

Price:

- Avg movie ticket price
- Does studio get a % of incremental concession sales?
- What a 3rd party streaming service would pay
  - Paid flat fee or by number of views?

Volume:

- Number of potential ticket-buyers.
- Number of weeks in theaters.
- Does month of release affect sales?

Costs

Fixed

- How much will the film cost to market under each format?
- Will actor compensation change depending on format?
- Is there a fee for breaching an existing contract by selling to a streaming service?

Variable

- What % of revenue do theaters take from the release?
- Are there film shipping costs involved?

Risks

Streaming

- Theater chains could retaliate
- Reputation risk of releasing over 3rd party streaming instead of theaters
- Future contracts could be difficult to negotiate if actors or directors prefer theaters

Release in Theaters

- Decline in movie attendance as streaming has gotten popular
- A worldwide pandemic could make customers nervous to go out to theaters

Drive towards benchmarking past releases

Leo vs. The Space Invaders

Additional sample framework

1. Financial

Costs
- Fixed (Production, salary)
- Variable (additional marketing, royalties)

Streaming revenue
- # platform viewers
- Viewers who would watch
- Viewers who would pay for theater

Theater revenue
- # theaters
- Viewers / theater
- $ capture / viewer

2. Market

Competition
- Other movie releases
- Other TV/streaming releases
- Other entertainment

Seasonality implications

Consumer segments
- Age
- Genre

3. Company

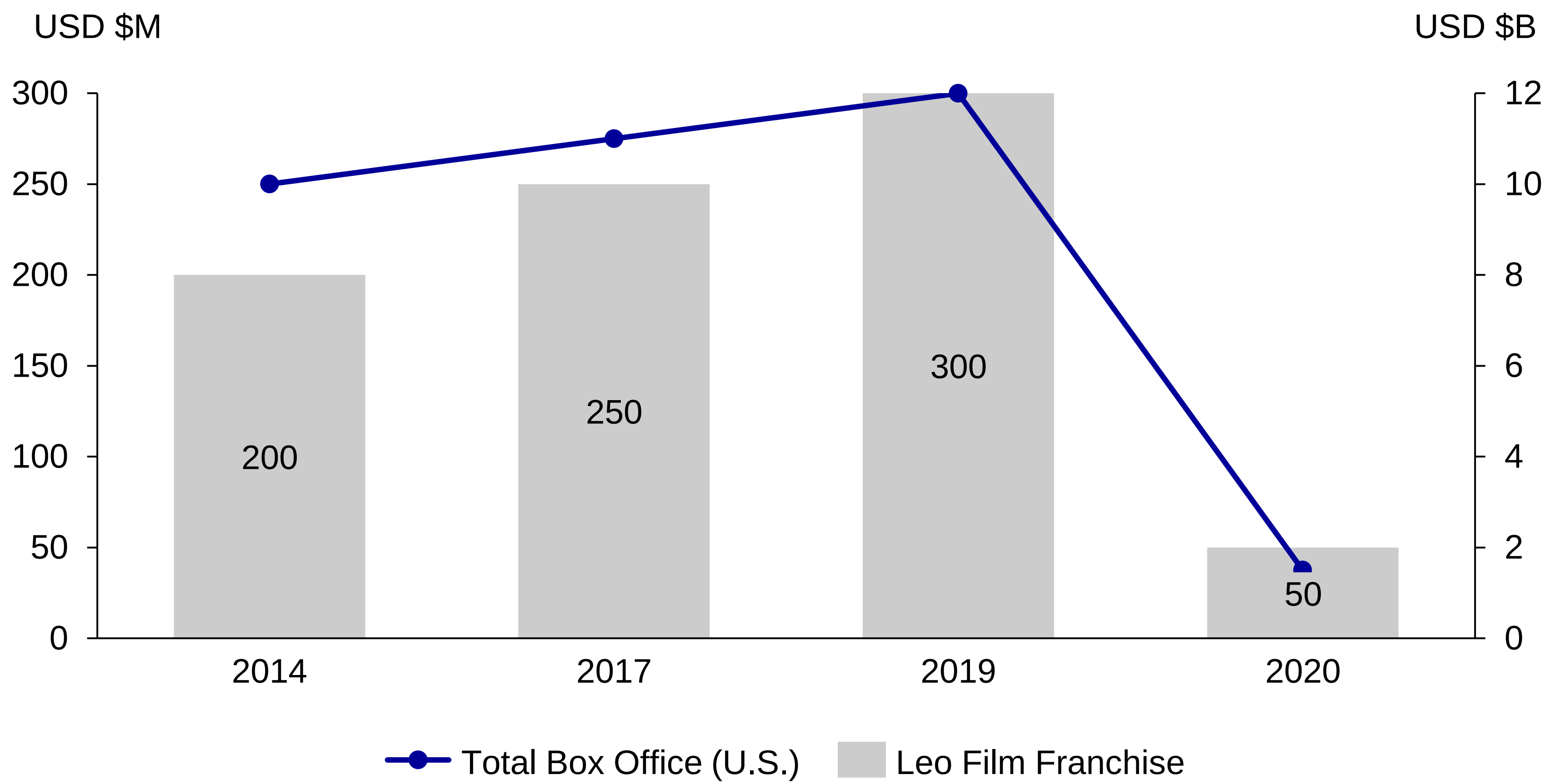
Marketing capability
- Self vs outsource
- Channel

Downstream implications
- Cross-sell other or future movies
- Licensee opportunities
- Brand recognition and reputation

Drive towards benchmarking past releases

Exhibit #1

Revenue for previous 4 Leo films vs. total US box office



Interviewer guidance on Exhibit #1

Exhibit #1 Guidance:

- The candidate can guesstimate the U.S. box office numbers based on the line graph and right axis (2014 = $10B, 2017 = $11B, 2019 = $12B, 2020 = $1.5B)
- The candidate should ask for projections for next year's box office, but please provide the following statistics either way .
  - # of theaters open in 2022: 80% of 2019 (5,000)
  - # of seats per screen: 100
  - Avg. # of showtimes per theater each day: 20
  - Average price per ticket: $10
  - Average occupancy rate for each screen:
    - 50% on weekend days
    - 25% on weekdays
- Using the above data and the data on the chart, **the candidate should proceed to estimate the potential revenue of the new film** (see next page)

Analysis:

- Basic:
  - The candidate should immediately calculate Leo films' percentage of overall box office revenue each year (next slide)
  - The candidate should draw the insights that the film has grown in popularity with each movie release with the exception of 2020.
  - A good candidate will ask about next year's theater projections, at which point the interviewer can give the data needed to estimate potential revenue.
- Second-order insights
  - The candidate should question whether the numbers from 2020 are the "new normal," or just an outlier.

Additional Calculations

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Theater-release Revenue

- Revenue for 4 previous Leo films as a % of U.S. box office:
  - 2014: $200M / $10B = 2%
  - 2017: $250M / $11B = ~2.3% (250M/10,000M = 2.5%, so conclude it's slightly less)
  - 2019: $300M / $12B = 2.5%
  - 2020: $50M / $1.5B = 3.3%
  - Average Leo film revenue = ~2.5% of U.S. box office
- Estimated 2022 box office:
  - Number of open theaters = 0.8 x 5,000 = 4,000
  - Number of seats available each day = 4,000 theaters x 20 showtimes x 100 seats x $10 tickets = $80M per day
  - Revenue per weekend = $80M seats x 50% occupancy x 2 weekend days x 50 weeks = $4.0B
  - Revenue per week = $80M seats x 25% occupancy x 5 weekdays x 50 weeks = $5.0B
  - Total projected box office revenue = $4.0B + $5.0B = $9.0B
- Estimated 2022 theater revenue for Leo vs. The Space Invaders = 2.5% x $9.0B = $225M

Exhibit #2

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Costs for each type of release

	Production	Marketing	Distribution Fee
Release in Theaters	$50M	$25M	20% of Revenue
Sell to Streaming Service	$50M	$0	$0

Interviewer guidance on Exhibit #2

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Exhibit #2 Guidance:

- The candidate should go ahead and calculate the expected profit for theater release vs. streaming.
- Assume the production costs include labor, actors' salaries, special effects, etc.)
- Shipping costs for film is considered a minimal expense, and can be ignored.

- Theater release:
  - Distribution fee: $225M x 20% = $45M
  - **Expected profit if released in theaters = $225M - $45M distribution fee – $50M production costs – $25M marketing costs = $105M**

- Sell to 3rd party streaming service:
  - **Profit = $150M - $50M production costs = $100M**

Analysis:

- Basic:
  - The candidate should recognize that the difference in profit is minimal between a theater release vs. selling to a 3rd party for streaming. Therefore, the candidate should come up with reasons to justify one vs. the other.
  - One important insight to draw is that the profit for streaming is fixed, whereas the profit for a theater release is only 'expected.' This should lead the candidate to talk about both the upside and downside of each.
- Second-order insights
  - A strong candidate will bring in their own experience over the past year if they have preferred one format of watching movies over another.
  - Although the expected numbers for a 2022 theater release are positive, there is significant downside if potential customers refuse to return to theaters.

Brainstorming

Prompt:

- What else can the production company due to maximize its profit potential?

Analysis:

- Revenue
  - Structure to release in theaters for a short period of time before exclusive rights move to the 3rd party streaming service.
  - Negotiate with other streaming services to see if they will pay more.
  - Look into merchandising to see if the production company gets a % of revenue from merchandise sales even if film rights are owned by the streaming service.
- Costs
  - Re-negotiate with theaters to see if they will lower the % of revenue they take from the film release.
  - Partner with another production company to split the production costs in return for future deals or a share of revenue

Leo vs. The Space Invaders

Recommendation

- The CEO of the production company wants your recommendation on whether to release Leo vs. The Space Invaders in theaters or sell exclusive rights to the 3rd party streaming service. What are you going to tell him?

Risks and Next Steps:

Either answer can be correct if justified in the analysis

- Potential risks of streaming:
  - Lose out on any future revenue from DVD or digital sales, merchandising, etc.
  - Reputation risk from both the industry and customers for not releasing the film in the “traditional” format.
  - Angering movie theater chains and losing leverage on future deals
  - It’s easier for streamed films to be copied and distributed illegally.
- Potential risks of theater release:
  - Profit is only an estimation, and could be significantly lower if people don’t return to theaters (whether out of preference, or due to unforeseen causes such as a new pandemic strain)
- Potential next steps:
  - Get legal to look at renegotiating existing distribution fee with theaters.
  - Survey potential customers to see which format they prefer to see films in going forward.
  - Look for other 3rd party streaming services who may offer a higher price for the film.

Trouble in 'Packaging' Paradise

Industry:	Industrial Goods
Case Type:	Profitability
Led by:	Interviewee
Case Level:	Medium

Behavioral Questions

Question 1:
• Tell me about a time when you experienced failure

Question 2:
• Tell me about a time when you had to deal with uncertainty

Trouble in ‘Packaging’ Paradise

Prompt #1:

Client is Newpads, an absorbent pads manufacturing company which recently got acquired by OldMoney Investments, a private equity fund. Newpads is a small manufacturing company with the revenue of $200M wit EBIDTA margin of 20%. OldMoney wants to improve the profitability of Newpads in order to increase the valuation of the company. Newpads needs your help in finding the best way to achieve this goal.

Case Background:

- Following information can be provided to the candidate if asked about it. Candidate should ask about the goal of the company (if asked provide the goal of 20% savings in total spend)
  - Client Goal: Looking to save 5% of EBDITA (candidate should calculate = $8M)
  - Industry/Competition information: The raw material prices depends on different commodity prices in the market like paper and pulp, polypropene, resins, etc. These prices are tracked through various indexes like RISI, etc.
  - Product information: Absorbent pads are used in meat/poultry products packaging in order to absorb the juices to keep them fresh.
  - Value Chain/Revenue information: Client works with multiple suppliers to obtain these raw materials and then the final product is supplied to grocery chains like Walmart.
- **For the interviewer** – Here total external spend consists of only raw material procurement spend, provide this information after the framework is created

Trouble in 'Packaging' Paradise

Framework Buckets:

- Candidates should create a cost savings framework (profitability framework is acceptable too) and determine if the selected option is profitable for the company. It is important that the framework cost bucket should have raw material procurement spend (external spend) mentioned in some way.

Cost Savings

External Costs

- Procurement costs
  - Raw material prices
  - Material conversion costs
- Shipping charges
- Special Equipment costs

Internal Costs

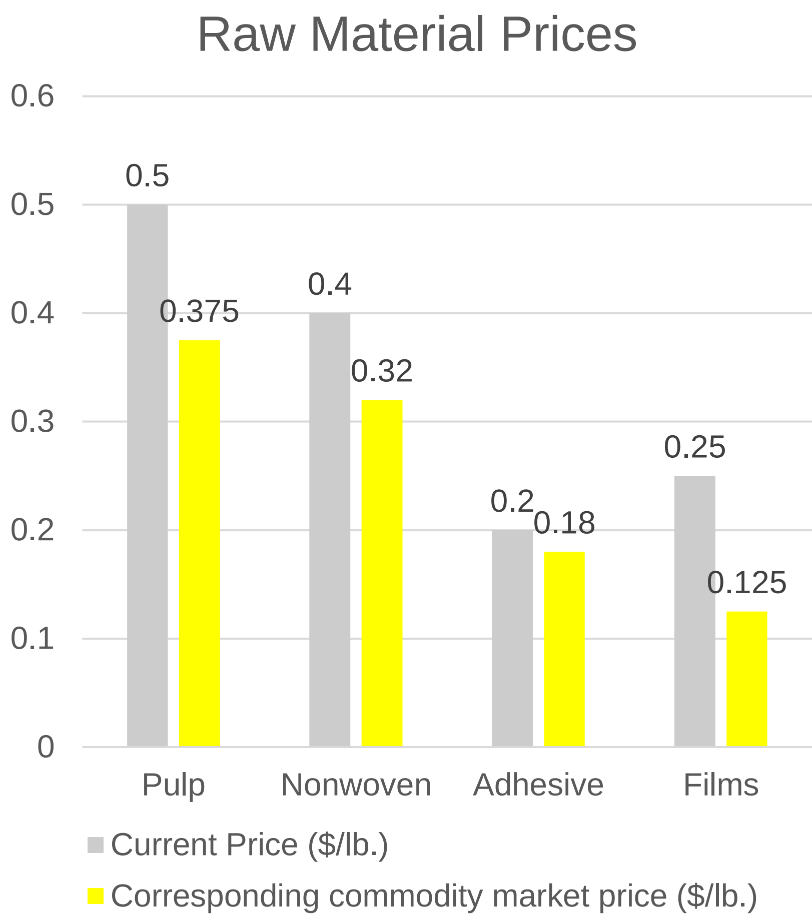
- Manufacturing costs
- Storage / Warehousing
- Distribution
- SG&A
  - Sales & Marketing
  - Corporate functions – HR, IT, Finance etc.
  - Admin overhead

Vertical integration

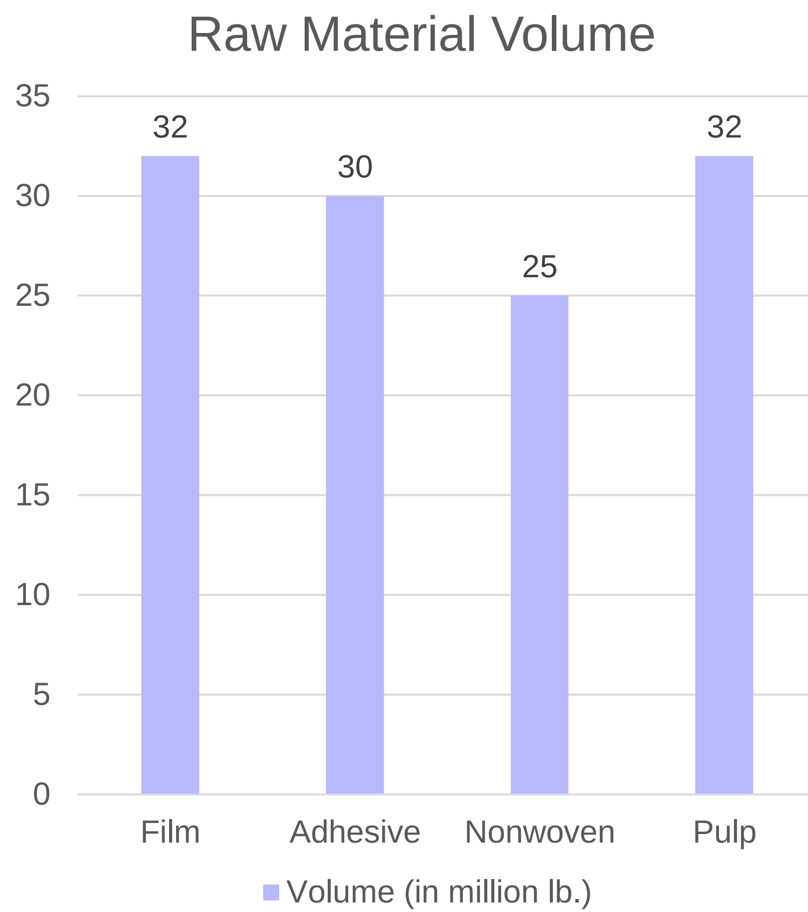
- Integrating production of some raw materials internally
- Consolidating shipping and executing internally

Drive towards raw material costs and volumes

Exhibit #1



Raw Material Prices
0.6
0.5
0.4
0.3
0.2
0.1
0
0.5
0.375
0.4
0.32
0.2
0.18
0.25
0.125
Pulp
Nonwoven
Adhesive
Films
Current Price ($/lb.)
Corresponding commodity market price ($/lb.)



Raw Material Volume
35
30
25
20
15
10
5
0
32
30
25
32
Film
Adhesive
Nonwoven
Pulp
Volume (in million lb.)

Interviewer guidance on Exhibits

Exhibit #1 Guidance:

- If the candidate talks about savings through the cost bucket, then share exhibit #1 with the candidate. If not, drive them to the cost bucket
- Tell the candidate that the client has decided to look at the external procurement spend in order to drive savings
- Candidate is given the raw material volume and per unit prices (current prices paid by the client and market prices). Candidate should be able to analyze that he/she needs to calculate the total current spend and spend with market prices for each raw material category. If the candidate is not able to understand this on his/her own, then drive them in this direction.
- After calculating both the spends they should understand that the savings target of $8M can be achieved by procuring material at the market prices.
- Once they get to this point, they should be able to tell that by focusing on only pulp and films the savings can be achieved. This is a second level insight.

Analysis:

- Analysis for the exhibit to have 2 parts –
  - <u>Basic:</u>
    - Getting the total savings if the raw material prices are dropped to the market prices, so changing the procurement strategy is profitable
  - <u>Second order insights:</u>
    - It can be achieved only with Pulp and Films category. So, we should only focus on these two categories.
    - It is important to focus on only fewer materials as conducting multiple negotiations with suppliers or getting new suppliers for all the categories can be difficult. Also, many changes with the current suppliers can cause disruptions in the value chain.
- Note axis are reversed on exhibit to ensure candidate reads axis properly

Exhibit #1 Calculations

Calculations

Raw Material	Volume (in million lb.)	Current Price ($/lb.)	Current Spend ($ Million)	Market Price ($/lb.)	Total New Spend (Million $)	Savings (Million $)
Pulp	32	0.5	16	0.375	12	4
Nonwoven	25	0.4	10	0.32	8	2
Adhesive	30	0.2	6	0.18	5.4	0.6
Films	32	0.25	8	0.125	4	4
Total	**119**		**40**		**29.4**	**10.6**

Analysis results:

Pulp and Films each drive $4M of savings. Great candidate will recognize challenges getting all the derived savings given contracts. Great candidate will have additional insights on why certain materials may be easier to cut costs with

Great candidate will recognize shortcut to reach savings:

Raw Material	Commodity price Difference	Volume	Savings (Million $)
Pulp	0.125 (1/8)	32	4
Nonwoven	0.08 (2/25)	25	2
Adhesive	0.02 (2/100)	30	0.6
Films	0.125 (1/8)	32	4
			10.6

Brainstorming

DUKE FUQUA SCHOOL OF BUSINESS

Prompt:

- What are some of the strategies that can be used to get lower prices from suppliers?

Analysis:

- Analysis of brainstorming should be structured

Example:

1. Negotiating with current suppliers –
   - Putting pressure on the suppliers by launching bids in the market
   - Using big market players to put pressure on the suppliers
   - Combining business of two categories and asking suppliers for discounts

2. Adding new suppliers –
   - Launch bids in the market and get new reliable suppliers with lower costs
   - Identify oversees suppliers with lower cost raw materials (countries like China and Mexico)

Drive towards exploring various Film suppliers

Exhibit #2

Film Supplier	Raw material costs ($/lb.)	Shipping costs ($/lb.)	Volume rebate (%)
Avery Plastics	0.15	0.05	30%
Global Films	0.11	0.02	8%
Allpoint Films	0.10	0.10	11%

* Avery Plastics and Global Films are US based companies, Allpoint Films is a China based company
* Volume rebate is given on raw material price and volume rebate is applicable if the total volume is >30M lb.

Exhibit #2 Calculations

Calculations

Film Suppliers	Volume (Million lb.)	Raw material costs ($/lb.)	Shipping costs ($/lb.)	Volume rebate	Raw material price with volume rebate ($/lb.)	Total price ($/lb.)	**Total New spend (Million $)**
Avery Plastics	32	0.15	0.05	30%	0.105	0.155	**4.96**
Global Films	32	0.11	0.02	8%	0.101	0.121	**3.88**
Allpoint Films	32	0.10	0.10	11%	0.09	0.19	**6.08**

Analysis results:
Global Films is lowest spend of new suppliers, but falls short of goal of $4.8M

Calculation tips:
Total price can be rounded to 0.15, 0.12 and 0.2. Interviewer can allow rounding of the numbers according to their discretion and time at hand

- Shortcut for Allpoint is to recognize 11% = 1/9

Next Steps:
Candidate should recognize that target goal is not met and recommend additional methods to get additional $4M+ in savings (boost revenue, or cut costs). Prompt candidate to do this if they don't get to it

Insights Analysis

- **Basic**: Global firms is the most profitable
- **Advanced**: Chinese supplier is most price competitive, but shipping is prohibitive. Recommend strategies to reduce this (get better discount, alternate shipping options)

Trouble in ‘Packaging’ Paradise

Recommendation

- Changing suppliers will create $3.8M in cost savings, however need to find another $4.2M to find goals
- Alternate ideas could be additional cost savings from negotiation contracts with other materials or ideas to boost revenue

Risks and Next Steps:

- Candidate can mention risk related to engaging with new supplier for Films – Quality of the material, delivery issues, delays in shipment, etc.
- Next steps - Testing materials of new suppliers, drawing the right contract terms related to rebates and discounts

Papyr Co.

Industry:	Industrial Goods
Case Type:	Profitability
Led by:	Interviewee
Case Level:	Medium

Behavioral Questions

DUKE FUQUA SCHOOL OF BUSINESS

Question 1:
• Whom do you view as your mentor and why?

Question 2:
• Tell me about a time where you navigated an ambiguous situation.

Papyr Co.

Prompt #1:

- Papyr is a paper distributor based in Ohio. Due to the declining demand for paper products, the company downsized the company headcount by 20% across all back-office functions. However, after comparing their actuals last year vs. the projected revenues, Papyr is interested in further improving their profitability. How would you advise them?

Case Background:

- Background information to be divided into these categories (Please mark N/A if information is not provided)–
  - Client/Company information : Papyr is a $5Bn paper-distributor based in Ohio.
  - Industry/Competition information : Paper distributor but the demand for paper is declining rapidly
  - Product information : Only distribute paper products to their customers (B2B business)
  - Value Chain/Revenue information : $5Bn Distribution company

Papyr Co

Framework Buckets:

Increase Profitability

Increase Revenue

- Price
  - Increase prices
- Quantity
  - Increase sales efforts to drive demand
- Product
  - Expanding product lines beyond paper
  - Expand SKUs distributed
  - Recyclable paper

Reduce Cost

- COGS
  - Supplier
  - Shipping
  - Storage / Warehousing
  - Distribution
- SG&A
  - Sales & Marketing
  - Corporate functions – HR, IT, Finance etc.
  - Admin overhead

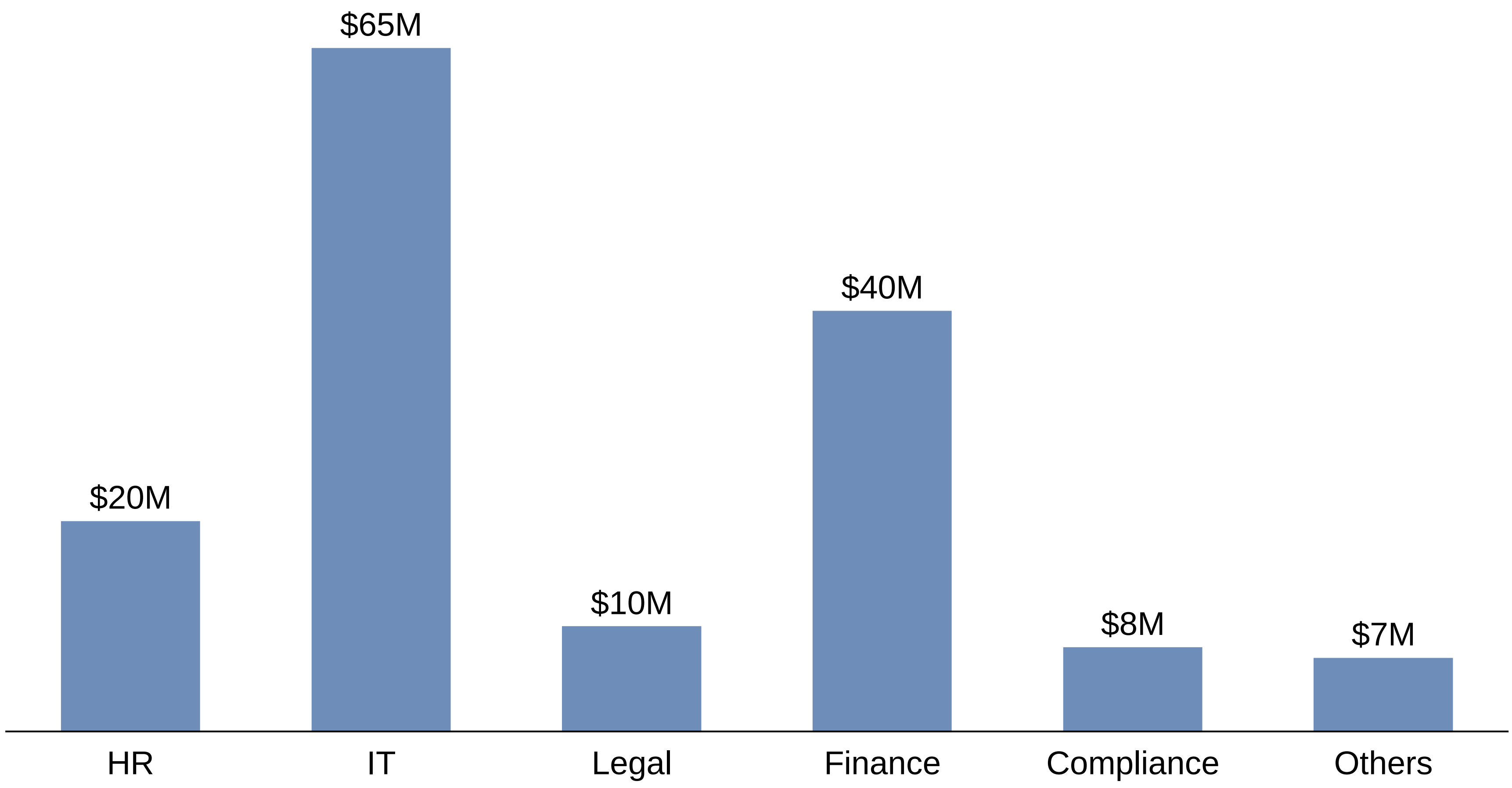
Other Considerations

- Declining demand for paper among consumers
- Availability of raw products

Drive towards Operating Expense breakdown
This is meant to pressure test candidate so they can remain calm through their framework

Exhibit #1

OpEx cost breakdown by G&A functions



Interviewer guidance on Exhibits

Exhibit #1 Guidance:

- Interviewer should steer towards this being a cost savings case of their back-office functions
- In order to identify focus / priority areas , the interviewee should look at the total spend across all the back-office functions and identify functions where the client is spending the most
- The interviewee should quickly identify that IT and Finance contribute to 70% of the total G&A OpEx
- Steer the interviewee towards IT being their priority function to focus on first and push the interviewee to tell you how they would go about estimating the savings potential
- The interviewee should think about peer benchmarking (if not steer towards it) and provide the below benchmarks –
  - ***IT Spend as % of revenue -***
    - Median benchmark - 1.6%
    - Top quartile benchmark – 1.1%

Analysis:

- **Analysis –**
- Show exhibit 1 when the interviewee asks for the spend breakdown
- Upon showing the exhibit, the interviewee should quickly identify that IT and Finance contribute to 70% of the total G&A OpEx
- Upon seeing the benchmarks, the interviewee should quickly calculate the IT spend as % of revenue ($80M / $5B Revenue = ~1.6%). After calculating, the interviewee should point out that the client is at par when compared to the median benchmark but should aim to be best-in-class
- Upon comparing with the top quartile benchmark, the interviewee should calculate the gap to benchmark and see that there is a $30Mn unconstrained savings opportunity and upon comparing with the median benchmark there is a savings potential of $20Mn

Brainstorming

Prompt:	Analysis:
• The company has already decided to implement a new ERP system which is expected to save the company ~$17 million in IT costs. In order to achieve the target $20 - $30 million in savings, what are some of the areas within IT that the client could look into?	• Analysis of brainstorming to have 2 parts – High level structure of the brainstorming – for example look into applications, infrastructure and personnel – Specific details (provide a few, an exhaustive list is optional) – can look at specific initiatives such as application rationalization, software vendor renegotiation under application, moving to cloud, data center consolidation under infrastructure and outsourcing / contracting within personnel

Drive towards comparing costs to outsource

Exhibit #2

DUKE FUQUA SCHOOL OF BUSINESS

Outsourcing

IT Sub-towers	# FTEs	% Internal Employees	Target employee %	Internal Employee Salary	Outsourced Salary
App Dev.	20	85%	60%	$130,000	$70,000
App Support	25	80%	40%	$125,000	$60,000
Data Center	18	100%	40%	$145,000	$55,000
End User Compute	16	70%	50%	$90,000	$30,000
Service Desk	15	80%	40%	$85,000	$20,000
Network	6	70%	40%	$140,000	$65,000

Interviewer guidance on Exhibits

DUKE FUQUA SCHOOL OF BUSINESS

Exhibit #2 Guidance:

- Interviewer should show exhibit 2 once the interview has provided a good list of areas that the client can look into to identify cost savings opportunity
- Once the interviewee mentions outsourcing, show the exhibit 2 or push the interviewee to think about the operating model / people / outsourcing

Analysis:

- Let the interviewee figure out the outsourcing savings by figuring out the math process (shown in the following slide)
  - Strong candidate should intuitively utilize math shortcuts (Salary – Labor; FTE x 1 – Target Employee %)
- There is ~$4M in potential savings from the outsourcing lever

Exhibit 2 : Solution (Interviewer reference only)

DUKE FUQUA SCHOOL OF BUSINESS

	Given in exhibit								
IT Sub-towers	**# FTEs**	**% Internal Employees**	**Target employee %**	**Internal Employee Salary**	**Outsourced Salary**	**Target employees**	**# of additional FTEs to be outsourced**	**Labor Arbitrage**	**Total Savings from outsouring**
App Dev.	20	85%	60%	$130,000	$70,000	12	8	$60,000	$480,000
App Support	25	80%	40%	$125,000	$60,000	10	15	$65,000	$975,000
Data Center	18	100%	40%	$145,000	$55,000	7	11	$90,000	$972,000
End User Compute	16	70%	50%	$90,000	$30,000	8	8	$60,000	$480,000
Service Desk	15	80%	40%	$85,000	$20,000	6	9	$65,000	$585,000
Network	6	70%	40%	$140,000	$65,000	2	4	$75,000	$270,000
						Total Savings			**$3,762,000**

Math shortcut would take FTE x (1 – target employees) x labor arb
Example with App Dev: 20 x 40% = 8 x 60k = 480k

Papyr Co.

DUKE FUQUA SCHOOL OF BUSINESS

Recommendation

- Based on a detailed analysis of your SG&A costs in the past year, we believe that Papyr can achieve $3.8 million in savings by outsourcing portion of its IT organization

Risks and Next Steps:

Risks:

- Buy-ins from stakeholders is key to realize the savings
- Legacy tech debt can impact realizable savings
- Other initiatives need to be considered to make sure savings are not duplicative e.g. the new ERP implementation

Next Steps:

- Interview key stakeholders to understand current state and start sizing all the savings initiatives
- Socialize findings with the stakeholders and gather buy-ins

Stale Chips

Industry:	**Consumer Goods**
Case Type:	**Market Entry**
Led by:	**Interviewee**
Case Level:	**Medium**

This case contains must know consulting math

Behavioral Questions

DUKE FUQUA SCHOOL OF BUSINESS

Question 1:

- Tell me a time that you failed and what you learned from it?

Question 2:

- Why do you want to work at this firm?

Stale Chips

Prompt #1:

- Bill's Chips is a multination producer of snacks. Their largest snack by total sales volume are potato chips. Currently, they are losing market share to their competitors in certain regions of the world. The are attempting to determine which market is the best to enter with a goal to maximize profitability in year 3. They have hired you to help with their assessment.

Case Background:

- Headquartered in Durham, NC. They have an extremely established brand with high customer loyalty
- Industry is highly competitive. Consumers largest driver of choice is taste preference
- Sell chips globally across all segments
- Customers are grocery stores who resale to consumers
- There is no profitability margin they are seeking. Aiming to maximize profit over 3 years.

Stale Chips

Framework Buckets:

- **<u>MARKET</u>**
- Competition
  - Is the market highly fragmented or are there several large players?
  - What is the anticipated penetration of the market?
- Size
  - How large is the market in terms of population and value?
- Growth
  - Is the market anticipated to grow or to contract over 5 years?
- **<u>PROFITABILITY</u>**
- Revenue
  - Price of Chips
    - What is the market rate for chips?
      - Are they above or below the market rate? Do they need to adjust their price to remain competitive?
  - Quantity of Chips
    - What size bags do they buy the chips in? Do they offer multiple size options?
- Cost
  - Fixed Cost
    - Factories, Fixed Contracts
  - Variable Cost
    - Inputs: Potato’s, Ingredients, Employee Wages
- **<u>EXTERNAL FACTORS</u>**
  - Geopolitical- tariffs between countries
  - Rise in commodity prices due to supply chain, scarcity, etc.
  - Labor strikes. Highly unionized industry

Drive towards market sizes and growth trends

Exhibit #1


Western Europe
Market Size: 50M
Current Penetration: 15%
Annual Growth: 5%
Western Canada
Market Size: 30M
Current Penetration: 20%
Annual Growth: 10%
Brazil
Market Size: 100M
Current Penetration: 3%
Annual Growth: 20%
Australia
Market Size: 30M
Current Penetration: 3%
Annual Growth: 5%

Interviewer guidance on Exhibits

Exhibit #1 Guidance:

- This exhibit covers the total market size. In the problem the interviewee should be inclined to calculate the total market size after 3-year growth. The exhibit covers market size, penetration, and 3-year growth. If interviewee does not drive the case towards calculating profitability prompt the interviewee to do so. The interviewee should determine that Western Europe is the ideal market to enter.
- Note that these are units sold

- * Calculations are on next slide. Figures in millions dollars (great candidate will clarify currency)

Analysis:

– Candidate should recognize that Australia is smallest market size, penetration and growth and ignore it

– Interviewee calculates the total market size and proceeds forward based on the total market size, choosing the largest one. Next the interviewee will move towards calculating total profitability.

– Great candidate will provide higher level insights why certain markets are bigger, growing faster, etc.

Exhibit Math

	Western Canada	Brazil	Western Europe
Year 0	30M x 20% = 6M	100M x 3% = 3M	50M * 15% = 7.5M
Year 1	(10% x 6M) + 6M = 6.6M	(20% x 3M) + 3M = 3.6M	(5% x 7.5M) + 7.5M = 7.87M
Year 2	(10% x 6.6M) + 6.6M =7.26M	(20% x 3.6M) + 3.6M = 4.3M	(5% x 7.87M) + 7.87M = 8.26M
Year 3	(10% x 7.3) + 7.3 = 8.0M	(20% x 4.3M) + 4.3M = 5.16M	(5% x 8.3M) + 8.3M = 8.7M

Note: Rounding is okay within 0.1M

A great candidate will calculate the growth rate to year 3 using shortcuts:

10% = 1.1 x 1.1 ≈ 1.2 x 1.1 ≈ 1.3 x 6M (10% of 30M) = 7.8M

20% = 1.2 x 1.2 ≈ 1.4 x 1.2 ≈ 1.7 x 3M (3% of 100M) = 5.1M

5% = 1.05 x 1.05 ≈ 1.1 x 1.05 ≈ 1.15 x 7.5M (15% of 50M) = 8.6M

Note the trick of multiplying by digits ending in 5:

- *105 x 105 → (drop the 5) → 10 x 11 (10+1) → 110 append (5x5) = 11,025 (note 4 decimal places)*

Exhibit #2

Flavor	Beer Battered Cod	Tuscan Wine	Lime Kiwi
Sales Price	$3.00	$3.00	$2.50
COSTS			
Manufacturing	$0.50	$0.25	$0.10
Ingredients	$1.00	$1.50	$0.40

Interviewer guidance on Exhibits

Exhibit #1 Guidance:

- Interviewee should calculate total profit per unit of chips and then multiple that by the appropriate market to calculate total profitability. The interviewee should determine that Lime Kiwi is the most profitable in the European market.

	Western Europe
Year 1	7.8M x $2.00 = $15.6M
Year 2	8.2M x $2.00 = $16.4M
Year 3	8.6M x $2.00 = $17.2-17.4M

If candidate calculates annual revenue, they should determine total value of ~$49-51M

Analysis:

- The interviewee should determine that Lime Kiwi is the most profitable in the European market.
- The interviewee should hypothesis of why the profitable is different per chip. Second level insights could be the distributor of the raw materials (packaging materials, flavors, potato's)

	Beer Battered Cod	Tuscan Wine	Lime Kiwi
Profit per Bag	$1.50	$1.25	$2.00
Great candidate will calculate profit margins	*50%*	*~40%*	*80%*

Year 3 profit opportunity = 8.6-8.7M x $2 = $17.2 – 17.4M

Brainstorming

DUKE FUQUA SCHOOL OF BUSINESS

Prompt:

Bill's Chips is concerned about rising costs - what can they do to minimize and/or stabilize costs?

To further test candidates:

Ask about setting up manufacturing in Europe or using existing logistics (note no right answer here)

Analysis:

Brainstorm should be structured (eg. Value chain, fixed vs variable, etc.):

Sample:

- Internal
  - Reallocate personnel to optimize performance and costs: Headcount
  - Optimize manufacturing process. Identify overlap in the processes to cut out unnecessary process
  - Increase efficiency and probability of inspection pass for chip quality checks
- External
  - Minimize distance in supply chain via local farmers
  - Secure extended contracts for raw materials at a fixed price
  - Minimize storage space required for raw materials to reduce storage costs

Conclusion

DUKE FUQUA SCHOOL OF BUSINESS

Recommendation

- The CEO of Bill’s Chips is looking for your recommendation on how to increase profitability for the company. Please provide your best recommendation.

Risks and Next Steps:

- Strong recommendations include the following items or similar reasoning:
  Bill’s Chips should enter the Western European market with the Lime Kiwi Flavor Chips, by doing so Bill’s Chips can generate approximately $17.2M in 3-years
- Risks:
  - Changing consumer trends for flavor preferences
  - Competitive pressure cause Bill’s Chips to reduce prices and generate less profit
- Next Steps/Mitigation:
  - Begin production process of the desired chip flavor to prototype it to gain consumer feedback in the desired market
  - Perform further analysis to confirm market research

School Supplies

Industry:	Education
Case Type:	Strategy
Led by:	Interviewee
Case Level:	Hard

Behavioral Questions

DUKE FUQUA SCHOOL OF BUSINESS

Question 1:

- What is constructive feedback that peers or a team would share about you?

Question 2:

- What analytical achievement are you the most proud of?
  - What was the analysis you did?
  - What was the measurable change that happened as a result?

School Supplies

Prompt #1:

- Our client is the new state superintendent of public schools, and is worried about teacher attrition in K-12 public schools in the state. Overall, the state attrition rate for teachers in 2018-2019 was 10%. There were 71,000 teachers employed during this time. The superintendent wants to understand how to improve teacher retention.

Case Background:

- Teacher attrition = the rate at which teachers exit the teaching profession in this state (i.e. they could move to a different state and continue teaching)
- We are only focused on teacher attrition in the K-12 public schools in the state.
  - The state has 115 public school districts and 2,500+ traditional public schools
  - In terms of student performance across the state, the average test scores are not significantly different from that of public school students in the nation
  - Nationwide teacher attrition is at 8% during the time of this case
  - Attrition includes teachers who retire
  - Teachers receive their full benefits and pension after teaching for 30 years

School Supplies

Sample Framework Buckets:

Who is leaving?	Why are they leaving?	What policies currently exist?

• Beginning or experienced teachers
• Teachers from specific subject areas
• Teachers in specific school districts
• Teachers from specific demographics
	• Personal reasons (e.g. family responsibilities, relocation, dissatisfied with teaching, career change, teach in non-public school, etc.)
	• Dismissed by school
	• Retirement
	• Lack of pay, respect, etc.
	• Struggles with content
		• New teacher support programs?
		  ◦ State, district, or school level
		• Retention programs to keep teachers in the classroom
		  ◦ State, district, or school level
		• System for tracking teacher retention risks prior to EOY

Drive candidate towards who is leaving

Additional Sample Framework

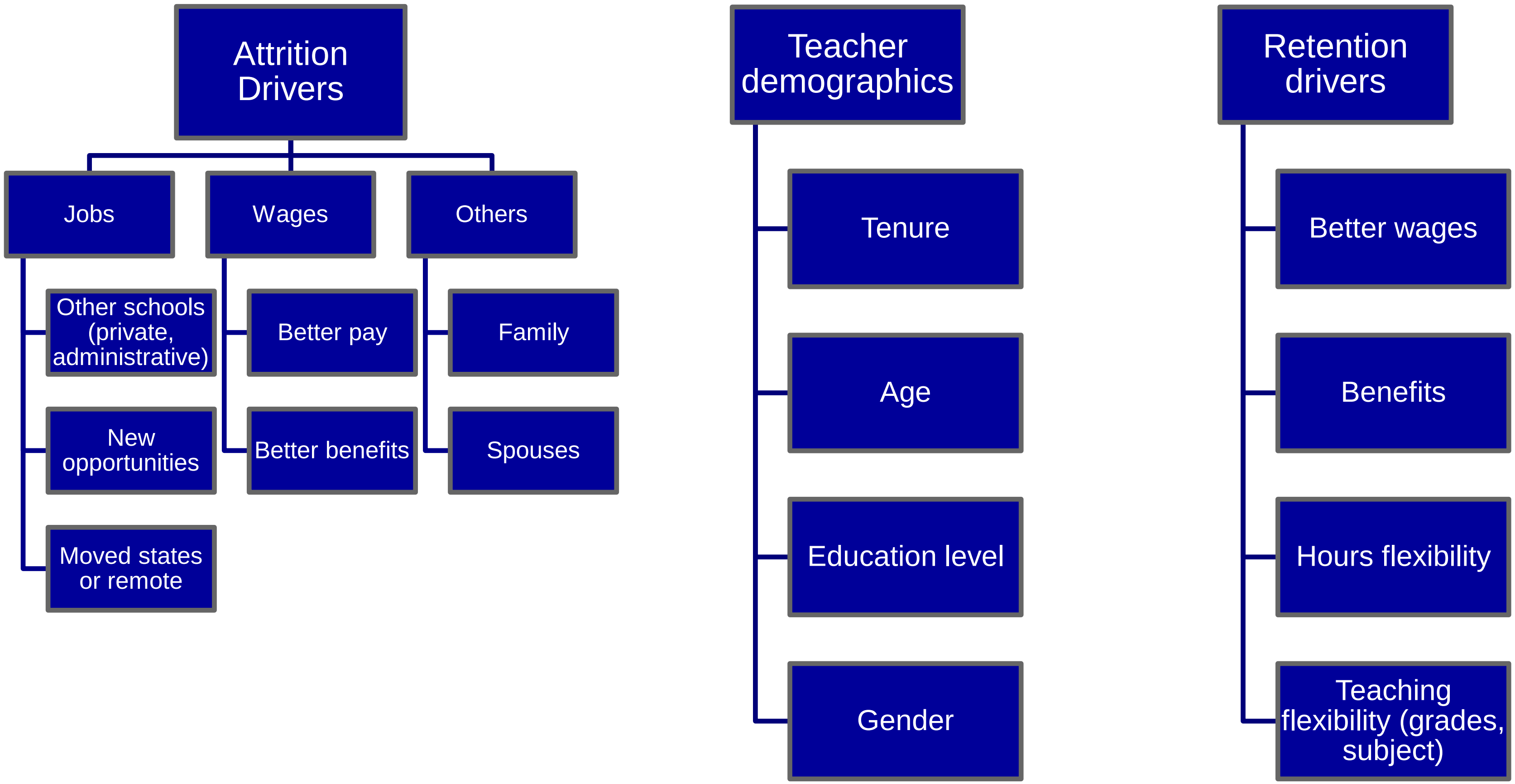
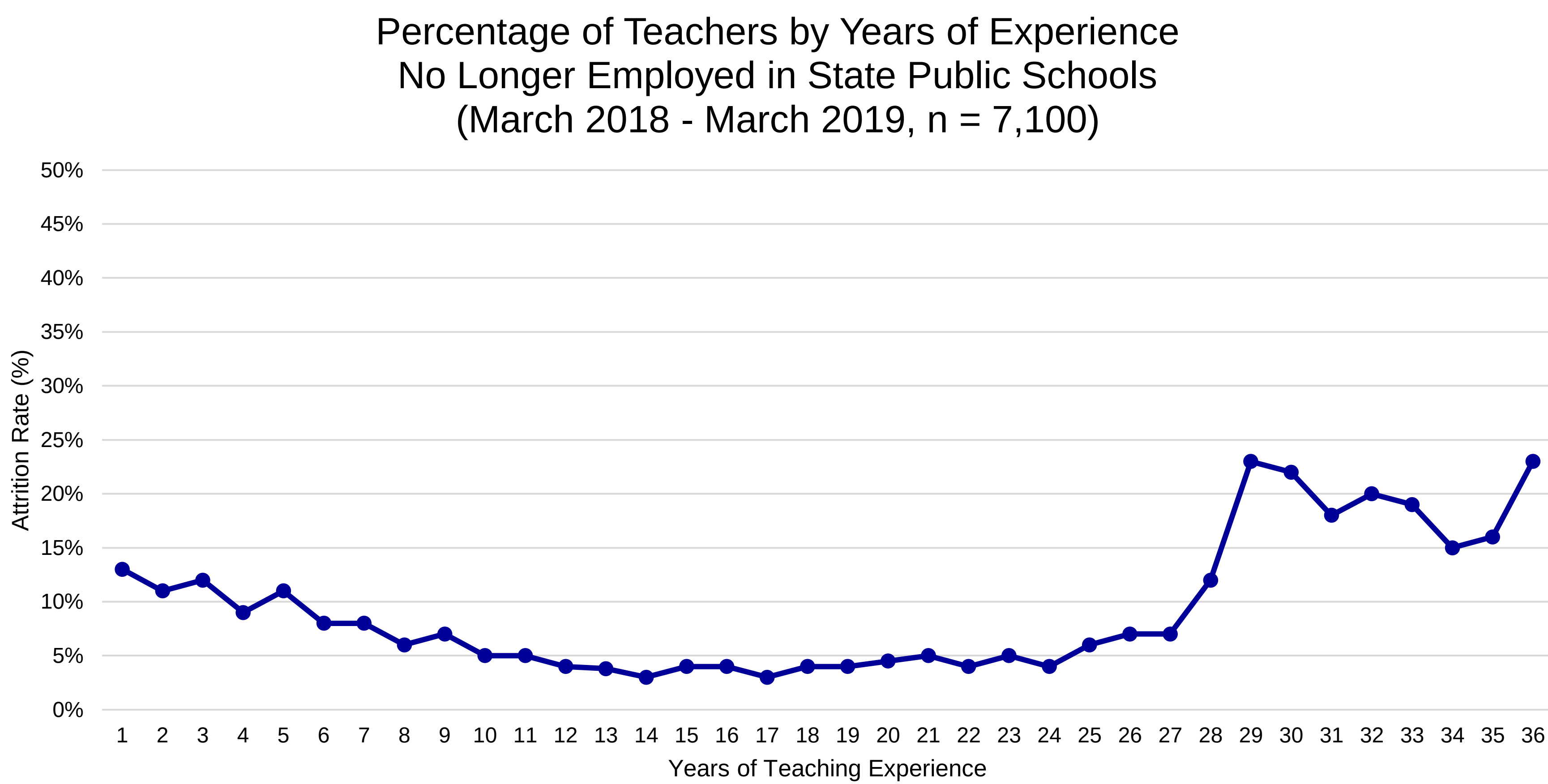


Exhibit #1a

Category of Teachers	Total number of Teachers in Category 2018-2019	Number of Teachers Leaving State Public Schools	% Attrition in Category 2018-2019
Experienced, Licensed Teachers	56,500	5,100	
Beginning Teachers	14,500	1,750	

Exhibit #1b


Percentage of Teachers by Years of Experience
No Longer Employed in State Public Schools
(March 2018 - March 2019, n = 7,100)
Attrition Rate (%)
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
Years of Teaching Experience

Interviewer guidance on Exhibits

Exhibit #1 Guidance:

- Beginning teachers = fewer than 3 years of teaching experience
- Experienced, licensed teachers = more than 3 years of teaching experience
- Teachers service retirement eligibility with unreduced benefits
  - Age 65 with 5 years of membership service (membership service means you contributed part of your wages & salary into the State Retirement System)
  - Age 60 with 25 years of creditable service
  - 30 years of creditable service at any age
- Teachers service retirement eligibility with reduced benefits
  - 60 years with 5 years membership service
  - 50 years with 20 years of creditable service

Analysis:

- % attrition
  - Beginning teachers: ~12%
    - Round to 18/150 = 6/50 = 12%
  - Experienced teachers: ~9%
    - Should immediately recognize attrition is < 10%
    - 10% = 5,650 – 600 = ~5,150
  - Great candidates will see beginning teachers have a 33% higher attrition than experienced teachers
- There is a large spike between years 27-30 in teachers retiring
  - Is it because they are 60 and eligible for full retirement or are they leaving early with reduced benefits?

Drive candidate towards reasons why people are leaving

Exhibit #2

Reasons for Attrition	Number	% of Total Attrition
Personal Reasons	**4315**	**61%**
Resigned due to family responsibilities/childcare	550	8%
Resigned to continue education/sabbatical	120	2%
Resigned due to family relocation	720	10%
Resigned to teach in another state	710	10%
Dissatisfied with teaching	120	2%
Resigned due to career change	925	13%
Resigned due to health/disability	160	2%
Retired with reduced benefits	845	12%
Resigned to teach in a non-public/private school	165	1%
Initiated by School District	**570**	**8%**
Non-renewal/not rehired	385	5%
Dismissed	40	0.6%
Resigned in lieu of non-renewal/dismissal	145	2%
Beyond Control of School District	**1690**	**24%**
Retired with full benefits	1405	20%
End of Term (International or Alt Cert Teachers)	160	2%
Resigned due to movement required by Military Orders	125	2%
Other Reasons	**525**	**8%**

Interviewer guidance on Exhibits

DUKE FUQUA SCHOOL OF BUSINESS

Exhibit #2 Guidance:

- Each teacher who resigned only has one reason for resigning (ie. There is no double-counting of teachers even if some reasons may seem similar)
- Teachers self-reported these reasons during exit interviews
- The "Other" category consists of people who either did not report a reason or did not complete their exit interview.
- These are people who are leaving the teaching system in the state completely, <u>not</u> teachers who may transition from being a classroom teacher to becoming a principal or academic coach (that would be mobility not attrition)

Analysis:

- Highest percentages of attrition
  - Personal reasons are the number one overall factor, but there is variance within that for what the reasons are
  - Retired with full benefits (20%)
  - Resigned due to career change (13%)
  - Retired with reduced benefits (12%)
  - Resigned due to family relocation (10%)
  - Resigned to teach in another state (10%)
- A few of these reasons could have addressable root causes from the state
  - Career change, reduced benefits, teaching in another state
- A career change means leaving education completely; leaving with reduced benefits means retiring before the full 30 years of service are completed

Brainstorming

DUKE FUQUA SCHOOL OF BUSINESS

Prompt:

- What could the state do to address teacher attrition within the state?

Analysis:

- Beginning Teachers
  - Mentorship matching programs between beginning and experienced teachers to learn from veteran teachers
  - Pulse surveys to beginning teachers at a district/state level to better understand their ongoing needs
  - Dedicated resources provided to beginning teachers during high-stress periods of the year (ie. Beginning of the school year, testing periods,
  - Social media profiling of beginning teachers to help them feel like a part of the broader statewide teaching community
- Experienced Teachers (20+ years)
  - Anonymous pulse surveys to highly experienced teachers to understand what keeps them in the classroom and why they might be interested in leaving
  - Statewide opportunities to visit excellent classrooms around the state to continue learning
  - Develop professional learning communities among excellent teachers and novice teachers
  - Teacher pay; education funding broadly

School Supplies

DUKE FUQUA SCHOOL OF BUSINESS

Recommendation

- You run into the new superintendent in the elevator and she asks for your recommendation.

Risks and Next Steps:

- Recommend leveraging technology to develop robust peer networks between beginning and experienced teachers to help them stay connected to the community
- Risks:
  - Political capital necessary to create a major system
  - May take a long time to get right
  - Teachers feel like it's another thing to do if they are only able to utilize the network outside of school hours
- Next Steps:
  - Conduct an anonymous survey to understand who is considering leaving and why
  - Identify target group of beginning and experienced teachers to serve as initial focus group

Fuquan Land

Industry:	**Agriculture**
Case Type:	**Strategy**
Led by:	**Interviewee**
Case Level:	**Hard**

This is representative of a Bain case

Behavioral Questions

Question 1:

- Tell me about a time you failed.

Question 2:

- Tell me about a conflict you experienced.

Fuquan Land

Prompt #1:

A retired Fuqua professor is thinking about buying a piece of land in the surrounding Durham area. The land includes 10 acres which is ready for development. The financial goal of this professor is to achieve $20,000 of profit within two years, exclusive of the purchase price. Is this a good idea?

Case Background:

- If asked what the ground is used for, ask for brainstorming options and then specify "agricultural development"
  - Brainstorm should remain structured – Commercial (housing, real estate), farming (animals, crops)
- Professor has educational background in agro-engineering & has consulted on behalf of commercial partners

The initial brainstorm before the framework is intentional. This may occur in interviews, being adaptable and flexible is important

Fuquan Land

Framework Buckets:

Revenue Generation

- Farming
  - Land viability
  - Crop type
  - Short turnover for profit
- Commercial real estate development
  - Investor appetite
  - Community enhancement potential
  - Longer timeline for profitability
- Residential real estate development
  - State of housing market short term vs long term
  - Population trends / Durham projected growth rate

Costs

- Government fees
  - Restrictions on land use for certain areas
  - Zoning
- Property taxes
  - Tax rate for professor
  - Alternate methods for acquisition
- Planning costs
  - Project planning
  - Contracting

External factors

- Major companies moving into the triangle area
- Climate change and its affects on farming patterns short and long term
- Community perceptions – where is this land and what are the negative/positive consequences of development
- Risks
  - Financing
  - Real estate crash

Fuquan Land

DUKE FUQUA SCHOOL OF BUSINESS

Additional Sample Framework:

Note this is personalized specifically to agriculture given clarifying questions

Market / Benchmarking

- Location
- Similar crops / competition (great candidate will specify crops)
- Product demand (Revenue)
  - Specific crops
  - Pricing levers
- Supply chain considerations
- Distribution channels (grocers, farmers market, etc.)

Professor

- Past experience
- Capabilities
- Financial health
- Investing in something else (different land, different vehicle)

Risks

- Climate change
- Local ordinance and regulations
- Animals eating
- Hedging given commodity

Can add potential brainstorm of "What are potential revenue drivers?"

Exhibit 1

Annual analysis of North Carolina market

	Pine Trees	Rose Bush	Beets	Saffron
Price ($) / Plant	150	105	45	75
Cost ($) / Plant	90	75	33	51
Market Demand	5,000	1,000	1,000	2,500
Competition Control (%)	60	20	85	90

Note 1: Assume Y1 start-up costs of $1,500
Note 2: Assume annual maintenance costs of $1,050

Exhibit 1 Guidance

Market Size

Demand: Market Size x Penetration Rate

- 5,000 Pine Trees x 40% = 2,000 units
- 1,000 Rose Bushes x 80% = 800 units
- 1,000 Beets x 15% = 150 units
- 2,500 Saffron x 10% = 250 units

Supply

- Ability to meet demand is dependent on acres available (10 acres)

Margins per unit

Price - Cost = Profit per unit

- $150 - 90 = $60 per Pine Tree
- $105 - $75 = $30 per Rose Bush
- $45 - $33 = $12 per Beet
- $75 - $51 = $24 per saffron

Profitability per Acre

of units per acre x profit per unit

- 10 Pine Trees per acre x $60 = $600/acre
- 25 Rose Bushes per acre x $30 = $750/acre
- 75 Beets per acre x $12 = $900/acre
- 50 Saffron per acre x $24 = $1,200/acre

(See below on plants / acre)

Financial projections

Start with maximizing most profitable crop, then if room, move on to the next:

- 250 units / 50 saffron per acre = 5 acres of Saffron x $1,200/acre = $6,000
- 150 / 75 beers per acre = 2 acres of Beets x $900/acre = $1,800
- 3 acres remaining for Rose Bushes x $750/acre = $2,250

Profit

- Year 1: $6,000 rev from Saffron + $1,800 rev from Beets + $2,250 rev from Rose Bushes - $1,500 Y1 cost - $1,050 labor cost = $7,500 profit
- Year 2: ($6,000 + $1,800 + $2,250) – $1,050 = $9,000 profit (Great candidate will ask about growth rate, state it's flat at 0%)
- Total Profit for first 2 years: $16,500

The purpose of this is to systematically work though calculations given ambiguity

- If asked, client can capture remaining share of market
- **Great candidate should ask "how many plants can fit on an acre". Otherwise provide the below**
- **Provide Plant / Acre: 10 Pine trees, 25 rose bushes, 75 beets, 50 saffron**

If candidate gets lost, start driving towards profitability / acre

Interviewer guidance

Prompt #2 (Optional):

To make the case more challenging, ask:

What are additional levers you could use to reach profit goal?

- Pricing
  - Cost-based pricing
  - Value-based pricing
  - Market pricing price (note these are probably commodities, so hard to adjust)
  - Segmentation (premium/standard, customer personas)
- Volume
  - New markets
  - Up-sell or cross-sell other products
  - Grow more
  - Bundle
- Other profitability streams
  - Farm tours
  - Renting additional land
  - Lowering costs (student labor/mentored studies, lower channel costs)

Fuquan Land

Recommendation

- "I recommend the professor does not invest in the land. I calculated that $16,500 in profit could be realized within the first two years, not meeting goal of $20,000."
  - Include alternate ways to grow profit
  - Include alternate allocation for spending money
- If candidate recommend to buy, they should have solid ways to make up the $3,500 difference

Risks and Next Steps:

- Some risks that may impact the validity of the analysis include changes in estimated demand, capturing whole market that remains, unforeseen natural disasters, and increased competition.
- Next, the client should move forward investing in the land while also planning for ways to mitigate some of these risks such as pesticides to defend against infestation and estimating the growth rate of the market.

This is representative of a Bain case that requires structuring an approach to solving the problem before jumping in to the actual numbers.

OrthoGel

Industry:	**Healthcare**
Case Type:	**M&A**
Led by:	**Interviewee**
Case Level:	**Hard**

This is representative of a BCG case. Do not give this case to candidates that have done a BCG mock with blood-clotting since they contain similar elements.

Behavioral Questions

DUKE FUQUA SCHOOL OF BUSINESS

Question 1:

- How do you manage stress?

Question 2:

- Why this firm?

OrthoGel

Prompt #1:

Your client is OrthoGel, a medical device company that manufacturers a hydrogel used in surgeries to help patients recovery. The gel is applied with a biodegradable sponge. OrthoGel is considering a deal with a sponge manufacturer, SpongeBob, to combine the gel with a sponge to create a hybrid product. SpongeBob would be in charge of the sales & marketing of the final product. Should OrthoGel make a deal with SpongeBob? If so, what should OrthoGel negotiate?

Case Background:

General
- Proposed structure is OrthoGel sells directly to SpongeBob
- Financial target is to maintain or improve profitability

Customer/Market:
- Combined product allows for greater efficiency in post-op recovery
- Market size is great – not relevant for case analysis

Competition:
- OrthoGel is market leader, has unique IP
- Sponges are a commodity with multiple vendors

OrthoGel

Framework Buckets:

- Deal structure
  - Yes
    - Up-front payment
    - Royalty
    - Greater upsell
  - No
    - Direct sales channel
    - Different partner
    - Build sponges
- Market
  - Market size
  - WTP
  - Alternatives
  - Insurance reimburseme nt
  - Regulatory hurdles
- Company Capabilities
  - Manufacturing
  - Selling
  - Marketing

Goal: Drive candidate to pricing and willingness to pay (WTP)

Exhibit 1 (verbal) – Price Potential

Guidance:

Pricing -Give this information:

- WTP vial= \$50
- WTP sponge = \$10
- WTP increases by 15% for combined product

If asked for:

- Clinic needs 3 sponges / vial
- Products are single-use
- Sponges are a commodity

Calculations:

With 1 Sponge:

- Current price to customer = \$60
- **WTP combined product = \$69**

Great candidate will note current margins

- OrthoGel contribution = $\frac{50}{60} = 83.33\%$
- SpongeBob contribution = $\frac{10}{60} = 16.67\%$

With 3 Sponge:

- Current price to customer = \$80
- **WTP for combined = \$92**
- BloodStop contribution = $\frac{50}{80} = 62.5\%$
- SpongeBob contribution = $\frac{30}{80} = 37.5\%$

If candidate does not drive, ask to brainstorm what other considerations are needed for the deal and drive towards to current COGS

Exhibit 2

OrthoGel Financial Analysis

	Stand-Alone	Combined
Revenue		
Price / unit	$50	-
COGS (per unit)		
Materials	$1.00	$0.90
Manufacturing	$0.25	$0.20
Packaging	$0.15	$0.10
Labor	$2.10	$1.80
Sales & Marketing	$1.50	$0.50

It costs SpongeBob $2 to manufacture a sponge

Exhibit 1 Guidance

DUKE FUQUA SCHOOL OF BUSINESS

	Stand-Alone	Combined
COGS		
Materials	$1.00	$0.90
Manufacturing	$0.25	$0.20
Packaging	$0.15	$0.10
Labor	$2.10	$1.80
Sales & Marketing	$1.50	$0.50
Total Cost OrthoGel	**$5.00**	**$3.50**

1) Great candidate should ignore revenue and determine final costs quickly

2) Candidate should easily calculate total costs for OrthoGel. Ask "What should OrthoGel charge SpongBob to **maintain** current unit margin? (Direct candidate appropriately if they start converting to % and struggle)
    - Current margin = $50-$5 = $45
    - To maintain margin: $3.50 + 45 = $48.50

Analysis:

- Candidate should recognize
    - OrthoGel gets $48.50
    - SpongeBob gets $20.50 (1 sponge)
    - SpongeBob gets $43.50 (3 sponge)
- A great candidate will realize the value of this combination comes from the gel, and they can capture more of the value from WTP
    - OrthoGel margin slightly improves
    - SpongeBob margin decreases from 80% to 36%-47%[1]

[1]Pay $2 / sponge + $48.50 to OrthoGel with new deal structure. Range depending on 1 or 3 sponge revenue WTP.

Brainstorm

Ask – What do you think about the deal structure?

Financial

Revenue

- Charge more given higher WTP
  - Value-based
  - % margin capture
- Cannibalization implications
- Royalty
- Revenue-sharing with SpongeBob
- Volume-based discounting

Costs

- Further minimize with volume based manufacturing
- Reallocate headcount (if deal goes through

Non-Financial

Operations

- Manufacturing feasibility
- Regulatory implications
- Changes to service & support needs

Competition

- Assess other sponge manufactures for partnership
- Evaluate sales & marketing benefits (if deal goes through)
  - Enter new markets
  - Capture new customers

OrthoGel

DUKE FUQUA SCHOOL OF BUSINESS

Recommendation

- If no clear recommendation was provided as part of brainstorm, ask for concluding thoughts (meant to be ambiguous)
- Good – Deal creates value for both parties so go through
- Great – Client OrthoGel drives disproportional part of value and should negotiate higher rate or look at alternatives to sponges. SpongeBob margins decrease significantly.

Risks and Next Steps:

- Good answers will be routine (regulatory hurdles, due diligence, etc.)
- Great answers incorporate some “out-of-box” thinking

This case is difficult since it deals with joint-venture. It also requires keeping track of different numbers for various parties, critical thinking against assumptions (# sponge / vial) and holistic analysis of the problem at hand

Evening Nightcap

Industry:	**Media**
Case Type:	**Growth**
Led by:	**Interviewee**
Case Level:	**Hard**

This case is meant to mimic Deloitte case

Behavioral Questions

DUKE FUQUA SCHOOL OF BUSINESS

Question 1:

- Tell me about a time you had conflict with a team member or colleague?

Question 2:

- What's your greatest strength and weakness?

Evening Nightcap

Prompt #1:

- Our client, Evening Nightcap, is a media company based in New York that specializes in a daily email newsletters recapping world news and top business stories in an easily digestible manner. Founded in 2013, Evening Nightcap has 100 employees and over 1 million subscribers. The CEO wants to expand the company's growth while keeping its brand identity and wants your help to determine what they should do.

Case Background:

- Client/Company information – It is a daily e-newsletter that goes out daily Monday to Friday at 6pm EST. Evening Nightcap has a loyal customer following and strong advertising partners. The brand relies on talented writers to communicate the proper voice, which resonates with its audience.
- Industry/Competition information – N/A
- Timeframe – N/A
- Product information – Subscribers do not pay a fee to read the newsletter, but advertisers pay anywhere between $50,000-$100,000 for a week (5 days) of email advertisements. At this time, the rate is a flat fee, regardless of subscribers There are currently 2 sponsors per email.
- Value Chain/Revenue information – Makes money by selling advertisements. *Revenues of 7.5 million if take average of 75,000/week using 50 weeks per year * 2 sponsors*
- Any constraints on the case – The CEO wants to keep the newsletter free to subscribers.
- Define growth: revenue growth over subscription growth.

Evening Nightcap

Framework Buckets:

Internal

- Charge current advertisers more
- Add additional sponsorship options to current newsletter
- Charge subscribers via a paywall
- Expand current product to Saturday & Sunday
- Affiliate marketing with advertisers

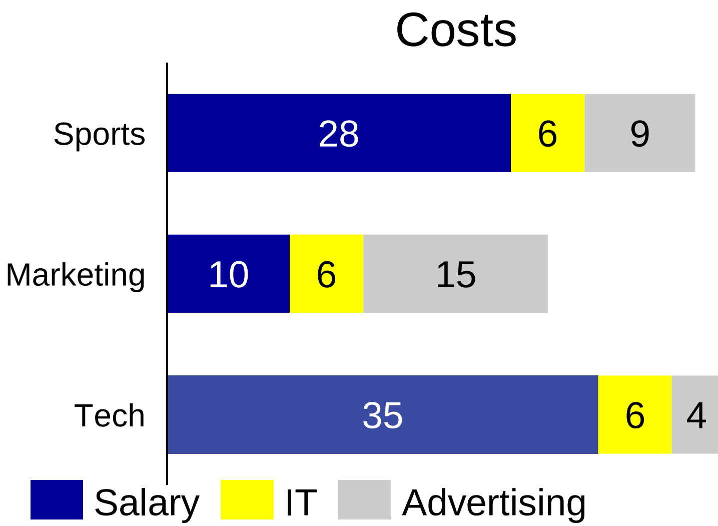
External

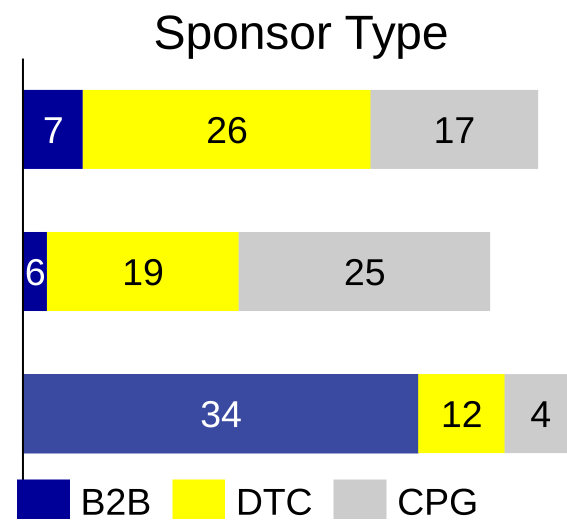
- BUILD: Launch a new product
  - New newsletter for specific industry –
  - Podcast
  - Events
  - Ability to cross-sell
- BUY: Buy another company in the newsletter space
- BORROW: Partner with another company and cross-promote
- Marketing Costs: more eyes = more subscribers = more audience for advertisers

Other Considerations/ Risks

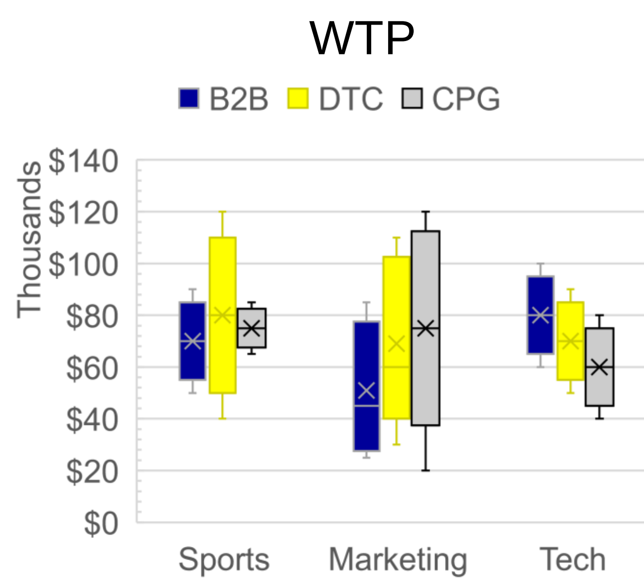
- Marginal costs –
  - Every writer needs an editor – hiring/talent cost
  - Need salespeople to sell additional advertisements – hiring/talent cost
  - Tech capabilities on the backend for operations
- Is there audience demand?
- Is their enough news to cover on weekends / specific industries?
- Market saturation

Exhibit 1





	Sports	Marketing	Tech
Audience interest	◕	◑	●
Grow new demographics	●	◔	◕
Ability to implement	◕	◑	◕
Competition	●	◔	◑
Grow sponsors	◔	◔	◕
Cross-sell	◔	◔	◔



Interviewer guidance on Exhibit

Exhibit #1 Guidance:

- Product Launch = industry specific newsletter. Because the newsletter would be new, the company wants to do a slow rollout – share if prompted
  - One advertiser per newsletter
  - One newsletter per week
- This is a graph heavy exhibit meant to throw the candidate off
- The candidate should acknowledge that the costs graph is irrelevant at this time because we are focused on revenue.
    - The candidate would be wise to take note of potential costs for a second level insight regarding risks in the recommendation.
- Quickly scanning, the candidate should realize that marketing is no longer a contender based on the Harvey Ball graph.
  - If prompted, the full Harvey ball in competition under Sports suggests that competition is quite saturated in this industry.
- The numbers in the sponsor type graph indicate sponsor interest within that category (B2B, DTC, CPG) for each industry vertical.
  - I.e. interest is highest in Sports for DTC
  - There are 50 sponsors total per to match up to one per week

Analysis:

- Candidate should calculate the WTP x Sponsor Type (B2B, DTC, & CPG) for both Sports & Tech. It is unnecessary to do Marketing.
  - It is suggested they take the average WTP at this time, which is marked by the X
  - Sports:
    - B2B x Ave WTP = 7*$70,000 = $490,000
    - DTC x Ave WTP =26*$80,000 = $2,080,000
    - CPG x Ave WTP = 17*$75,000 = $1,275,000
    - TOTAL = $3,845,000 revenue
  - Tech
    - B2B x Ave WTP = 34*$80,000 = $2,720,000
    - DTC x Ave WTP =12*$70,000 = $840,000
    - CPG x Ave WTP = 4*$60,000 = $240,000
    - TOTAL = $3,800,000 revenue
  - Sports > Tech by an additional $45,000 in revenue
    - However, due to Harvey Ball chart, candidate should see that Tech has more synergies for launch and should be prompted to choose Tech over Sports
    - Additional support can be found by calculating highest WTP for most desired sponsored type across both Sports & Tech (should the launch be well-received)
      - Sports: DTC x Max WTP =26*$120,000 = $3,120,000
      - Tech: B2B x Max WTP = 34*$100,000 = $3,400,000
      - Tech is $280,000 more revenue here
  - Should candidate be tempted to calculate Max WTP across all sponsor types – Sports > Tech
    - Yet, qualitative analysis should be applied with synergies in Harvey Ball chart

Brainstorming

DUKE FUQUA SCHOOL OF BUSINESS

Prompt:	**Analysis:**
Choose any of the below? 1. What are potential barriers to entry for a successful product launch? 2. How would you begin thinking about a go-to-market plan?	Brainstorm should remain structured and creative Example buckets: 1. Customers, competitors, costs 2. Promotion, financial

Evening Nightcap

Recommendation

- The CEO is ready to hear your recommendation!

Risks and Next Steps:

- Recommend launching a new product, specifically a newsletter focused on the technology space. This would bring additional revenues of $3.8M (if use Average WTP) for the company within the first year.
- Risk:
  - Potential dilution of brand with poor writing voice for new newsletter and audience doesn't respond in same way to core newsletter
  - Cannibalization of current advertisers to new newsletter – doesn't create additional or enough revenue growth
- Next steps:
  - Ensure proper hiring process for talent
  - Smooth integration of new newsletter into EN brand.
  - Expand current advertisers to spend across both newsletters

Changing Winds Under the Sun[1]

Industry:	**Oil & Gas (O&G)**
Case Type:	**Strategy**
Led by:	**Interviewer**
Case Level:	**Expert**

[1] Author does not have any material and non-public information pertaining to the company contracting with any third-party management consulting organization for the purposes outlined in and alluded to by this case. This company was chosen for illustrative and educational purposes only. This case is fictitious and loosely based on a management consulting engagement provided by an unnamed organization to an unnamed client.

Behavioral Questions

Question 1:

- Describe a time you recently felt uncomfortable. What was the root cause of the discomfort, and how did you manage it?

Question 2:

- Tell me about a time you created something. What did you create, how did you create it, and why did you create it?

Changing Winds Under the Sun

DUKE FUQUA SCHOOL OF BUSINESS

Prompt #1:

Sovereign Oil Co. (SOC)—a large oil & gas company headquartered in Europe—has seen its share price drop by more than 35% over the last 15 months vs an increase of 20% for the DJIA (Dow Jones) over the same period. The COVID-19 pandemic, which began in February 2020, has suppressed demand SOC's products and services.

In February 2021, SOC announced plans to reduce overall oil production output by 1 – 2% a year—including a reduction of diesel and gasoline production by 55% over the next decade—to reduce operating expenditures and curb its carbon emissions. Yet, SOC has been reticent to publicly announce a strategy to increase revenues while reducing oil production. Instead, they have committed to having fossil-fuels continue to be a major source of revenue through 2030.

SOC also faces increasing scrutiny from investors, governments, and environmental groups over its carbon emissions. Recently, in May 2021, a European court ruled that SOC must reduce its carbon emissions by 45% compared with 2019 levels. This ruling followed United Nations guidance for participating countries and signatories of the Conference of the Parties (COP21) "Paris Climate Agreement" focused on averting global temperatures from rising more than 1.5 degrees Celsius above "pre-industrial levels."

In response to their declining stock price and recent adverse court ruling, SOC has hired us to develop a 10-year strategy to guide the company's investments through 2030. What should SOC do?

Case Background:

- **Goal(s)**: Our client must reduce carbon emissions by 45% by 2030—in line with the court's ruling—while turning around its stock price.
- **Competitor(s)**: An activist and environmentally-friendly investor recently won two seats on our competitor's board, likely beginning changes to their short-term and long-term climate strategy.
  - In addition, many of our competitors have announced detailed plans to pursue various strategies to transition to low-carbon businesses like renewable energy.
- **Market**: Amazon, inc. plans to power its operations with 100% renewable energy by 2030 and seeks to purchase energy. SOC operates a B2B energy trading platform and could offer clean-energy to companies like AMZN
- **Company**: Our client has started investing in alternative and renewable energy initiatives, including a recent purchase of an electric vehicle charging company, a battery firm, and a renewable energy retailer/trading platform.
  - Value chain: Vertically integrated O&G "super-major" that operates business units from exploration to sales and marketing

Changing Winds Under the Sun (6 mins)

DUKE FUQUA SCHOOL OF BUSINESS

Framework Buckets:

- Suggested framework: questions-based buckets are a differentiator. Framework should also have a bucket for risks/barriers

How can SOC make its core O&G business more resilient?

Examples of resiliency strategies?

- Build bus. units for high and low commodity prices → Improve margins by reducing high costs assets
- Divest high-carbon/high emissions assets → Sell to competitors, PE, horizontally-integrated players
- Use competencies to expand O&G portfolio → Biofuels, carbon capture/carbon storage

→ **Candidate** should move forward by asking for information on what SOC's core business is and does

What will prevent SOC from staying the course in O&G?

Next steps to address barriers?

- Investor & shareholder pressure → Develop profitability scenarios for low-carbon scenarios
- Legal & societal pressure; carbon tax → Set emission and energy targets; stick to targets; comply with regs
- Adverse effects of climate change → Build/upgrade equipment and ops. to weather harsh climates
- Changing consumer preferences → Expand ESG initiatives and associated marketing

Should SOC expand to low-carbon businesses given market changes?

Examples of low-carbon strategies?

- Build low-carbon assets and capabilities → Invest in renewable energy production
  - Solar
  - Wind
  - Hydroelectric
  - Battery storage
- Buy low-carbon assets and capabilities → Acquire renewable energy production
- Partner with low-carbon producers → JV with low-carbon specialists; power purchase agreements

Interviewer – Brainstorming (3 mins)

Prompt:	Oil & Gas Value Chain

Question 1: How do you think Sovereign Oil Co. makes money, and which capabilities would be best suited to pivoting?

Analysis: an exceptional brainstorming should be organized by the Oil & Gas value chain. Sample answer shown to the right.

- **Acceptable**: Upstream, Mid-stream, Downstream (not case-specific)
- **Favorable**: Production, Processing, Distribution (more case-specific)
- **Exceptional**: Exploration, Extraction, Production, Transportation, Sales/Marketing (very case-specific)

If candidate does not organize their buckets using the value chain, explain the 5 major categories/buckets before proceeding with the case.

Question 2: Which activity do you think has the most opportunity to reduce carbon emissions?

Analysis: Any well-articulated answer will suffice. Candidate should have a sound rationale and good insights related to the activity they picked.

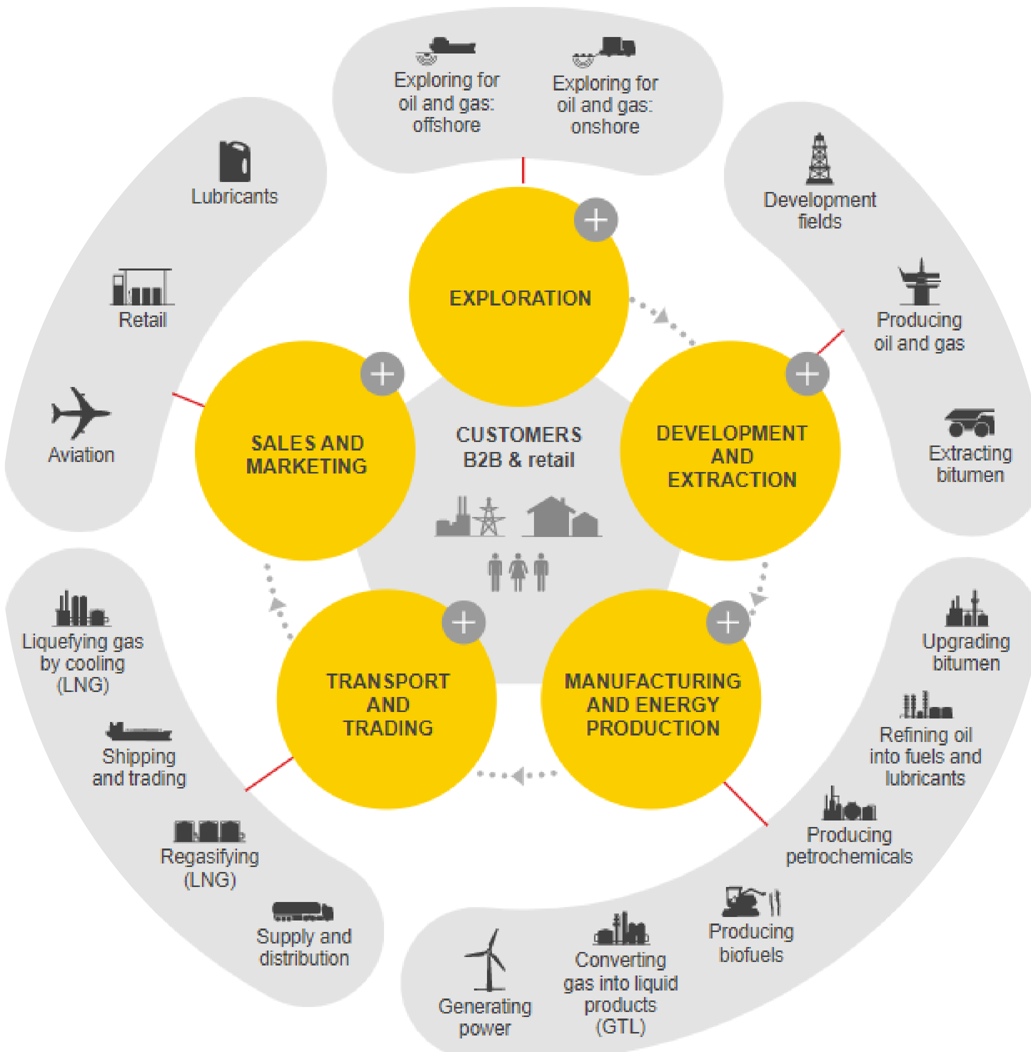
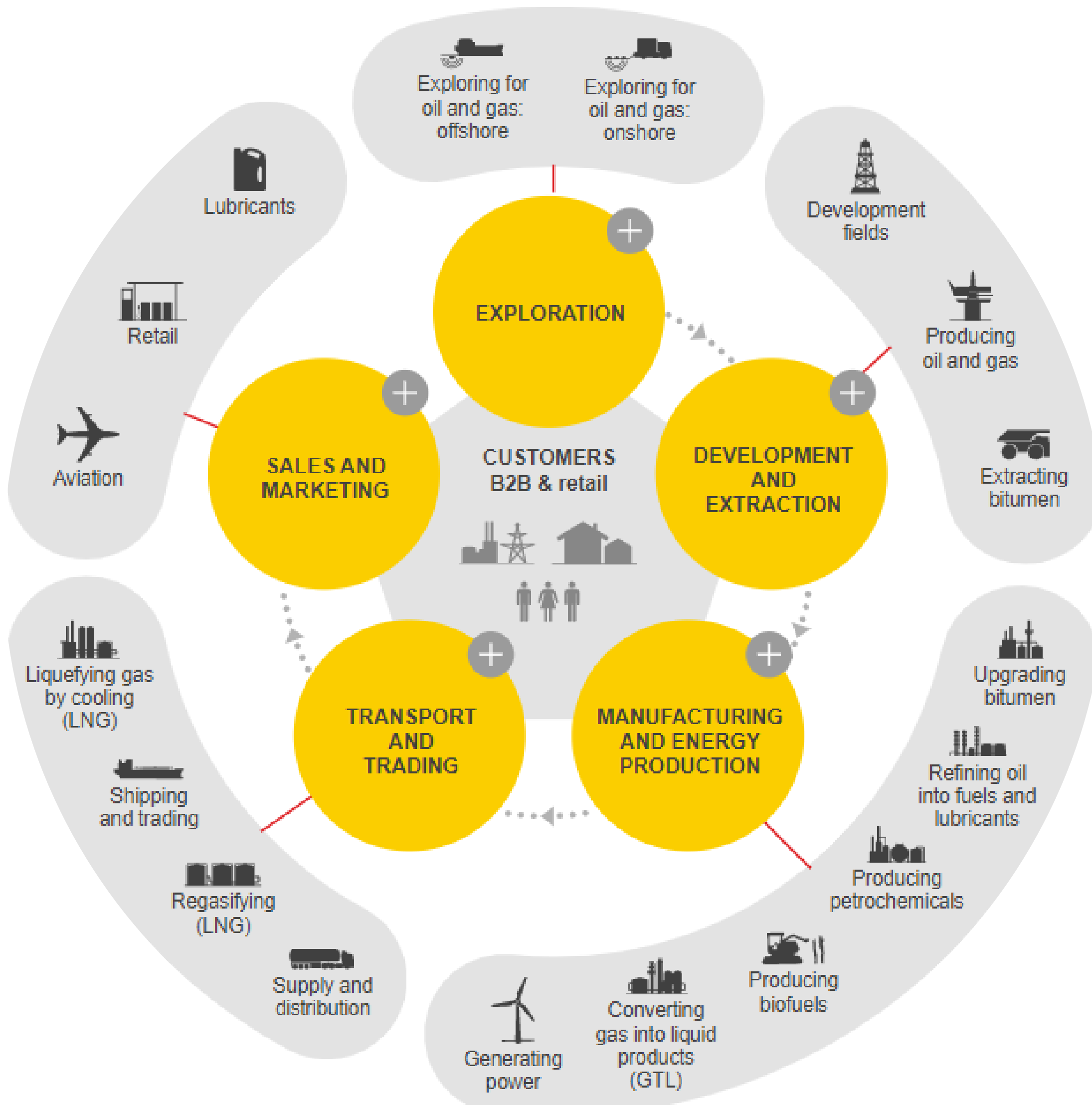


Exhibit 1

Sovereign Oil Co.'s Business Overview (Value Chain)



Interviewer - Exhibit 1 (1 min)

Exhibit 1 Guidance:

- **Interviewer Guidance**:
  - Show candidate Exhibit 1 after the brainstorm to ensure the candidate is familiar with SOC's value chain and operations
  - No more than 1 minute should be spent showing Exhibit 1. Move to Exhibit 2 afterwards

Analysis:

- <u>Basic insights</u>
  - **Candidate** does not need to do any analysis
- <u>Second order insights</u>
  - **An exceptional candidate** will ask for SOC's financial information to move forward

Exhibit 2

DUKE FUQUA SCHOOL OF BUSINESS

Sovereign Oil Co.'s Annual Report and Accounts by Segment, FY2020

	Integrated Gas	Upstream	Oil Products	Chemicals	Corporate	Total
Revenue:						
Third-party	33,287	6,767	128,717	11,721	51	180,543 [A] [B]
Inter-segment	3,410	21,564	6,213	2,850	—	34,037
Share of profit/(loss) of joint ventures and associates (CCS basis)	562	(7)	988	567	(268)	1,842
Interest and other income, of which:	14	542	(93)	—	406	869
Interest income	6	56	28	—	589	679
Net gains on sale and revaluation of non-current assets and businesses	218	55	(9)	(2)	24	286
Other	(210)	431	(112)	2	(207)	(96)
Third-party and inter-segment purchases (CCS basis)	21,112	4,505	113,177	9,969	8	148,771
Production and manufacturing expenses	5,723	10,521	5,942	1,787	28	24,001
Selling, distribution and administrative expenses	729	(23)	7,360	1,339	476	9,881
Research and development expenses	103	486	209	109	—	907
Exploration expenses	611	1,136	—	—	—	1,747
Depreciation, depletion and amortization charge, of which:	17,704	23,119	10,473	1,116	32	52,444
Impairment losses	12,221	8,697	6,531	5	9	27,463 [C]
Interest expense	76	374	56	3	3,580	4,089
Taxation (credit)/charge (CCS basis)	(2,507)	(467)	(898)	7	(983)	(4,848)
CCS earnings	(6,278)	(10,785)	(494)	808	(2,952)	(19,701)

[A] Includes $10,008 million of revenue from sources other than from contracts with customers, which mainly comprises the impact of fair value accounting of commodity derivatives. This amount includes both the reversal of prior gains of $1,136 million related to sales contracts and prior losses of $539 million related to purchase contracts that were previously recognized and where physical settlement has taken place during 2020.

[B] With effect from 2020, additional contracts are classified as held for trading purposes and consequently revenue is reported on a net rather than gross basis. The effect on revenue for the full year was a reduction of $46,289 million.

[C] Impairment losses comprise Property, plant and equipment ($26,676 million) and Intangible assets ($787 million).

Interviewer - Exhibit 2 (3 mins)

DUKE FUQUA SCHOOL OF BUSINESS

Exhibit 2 Guidance:

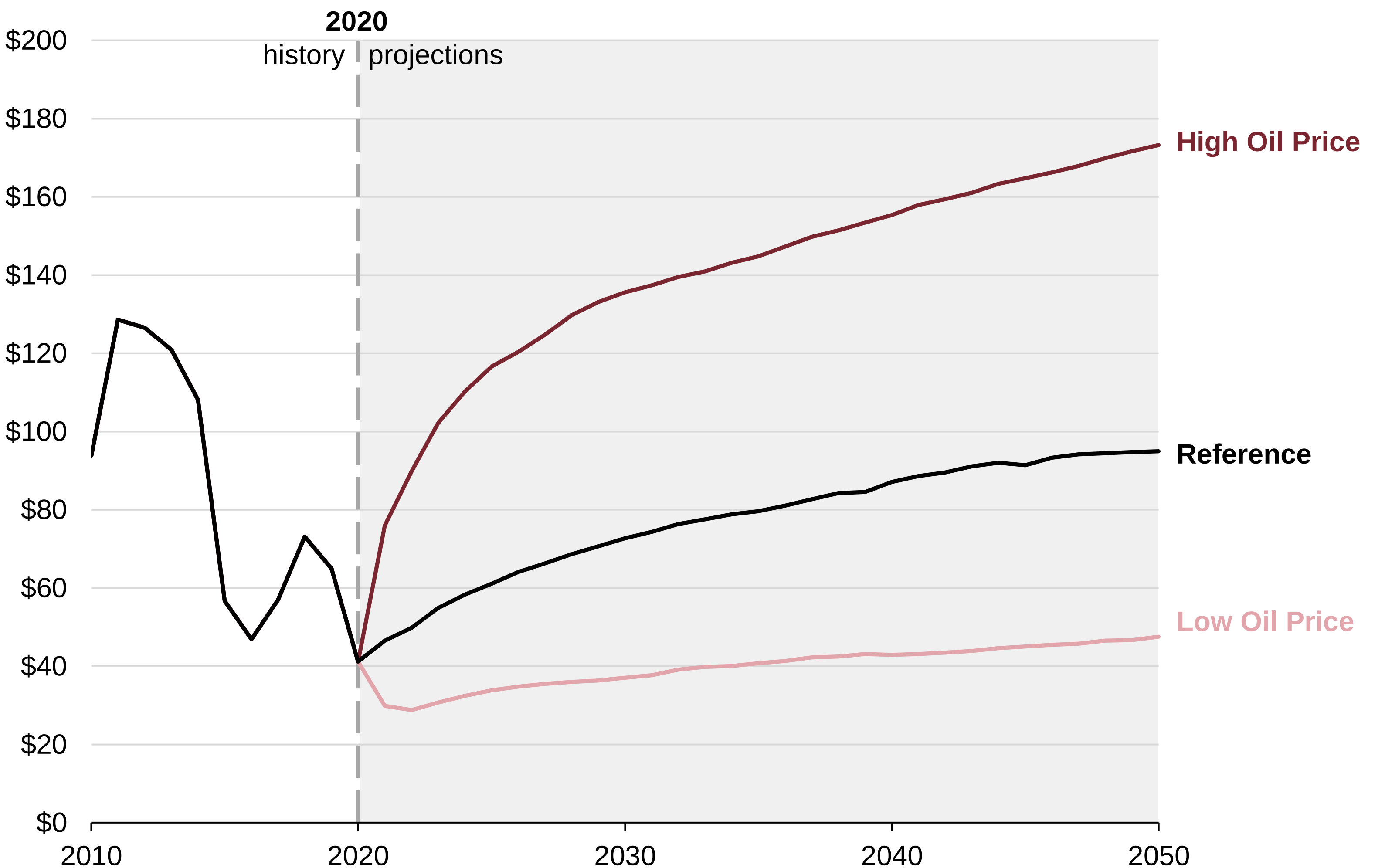
- **Question 3**:
  - **Background**: Now that we understand the scope of SOC's vertical integration and value chain, let's focus on the company's current business model before developing a recommended long-term plan.
  - **Question**: How does SOC make money, and how does its profitability compare across business units?
- **Interviewer Guidance & Clarifying Info**:
  - **CCS**: Current cost of supplies basis…the net income after adjusting for the increase (or decrease) in actual expenses over the reporting period. CCS affects the net income of a company because those costs, which depend on commodities market prices, are used to adjust expenses over a reporting period.
  - **Integrated gas**: manages liquefied natural gas (LNG) activities and the conversion of natural gas into gas-to-liquids (GTL) fuels and other products, as well as the New Energies portfolio
  - **Upstream**: explores for and extracts crude oil and natural gas. It also markets and transports oil and gas and operates the infrastructure necessary to deliver them to market.
  - **Oil Products**: comprises the Refining and Trading, and Marketing classes of business. The R&T class of business turns crude oil and other feedstocks into a range of oil products. The Marketing class of business includes the Retail, Lubricants, B2B, Pipelines and Biofuels
  - **Chemical**: operates manufacturing and its own marketing
  - **Corporate**: covers the non-operating activities supporting SOC, comprising SOC's holdings, its self-insurance activities and its headquarters and central functions.

Analysis:

- Basic insights
  - **Candidate** quickly recognizes the exhibit is a 2020 income statement with breakdowns of revenues and expenses by business segment
  - **Candidate** quickly identifies Oil Products as highest revenue-generating business segment
- Second order insights
  - **Candidate** performs quick mental math and analyzes each business segment's share of total revenue (e.g., Oil Products $129M / $180 = ~2/3 = ~66%)
  - **Candidate** performs quick mental math and recognizes > 50% (-10M / -19M) of SOC's FY2020 loss came from its Upstream division, with another ~33% coming from its Integrated Gas division
    - **Exceptional Candidate** will hypothesize as to why that may be
      - Short-run: decreased commodities prices for petroleum, oil, gas, etc. during the COVID-19 pandemic
      - Long-term: expansion of Oil & Gas production capacity and supply is reducing prices

Exhibit 3

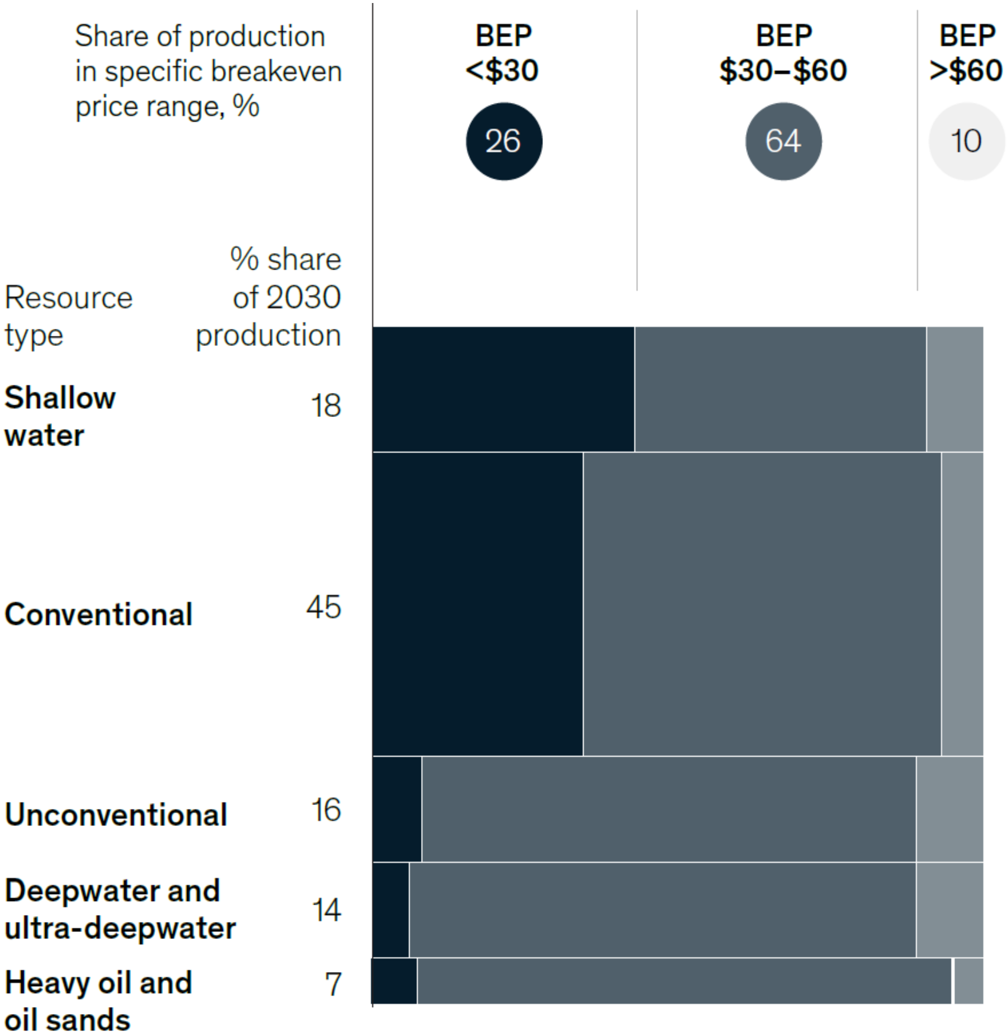
Crude oil price assumptions and price projections – 2020 dollars per barrel



Source: U.S. Energy Information Administration, *Annual Energy Outlook 2021* (AEO2021)

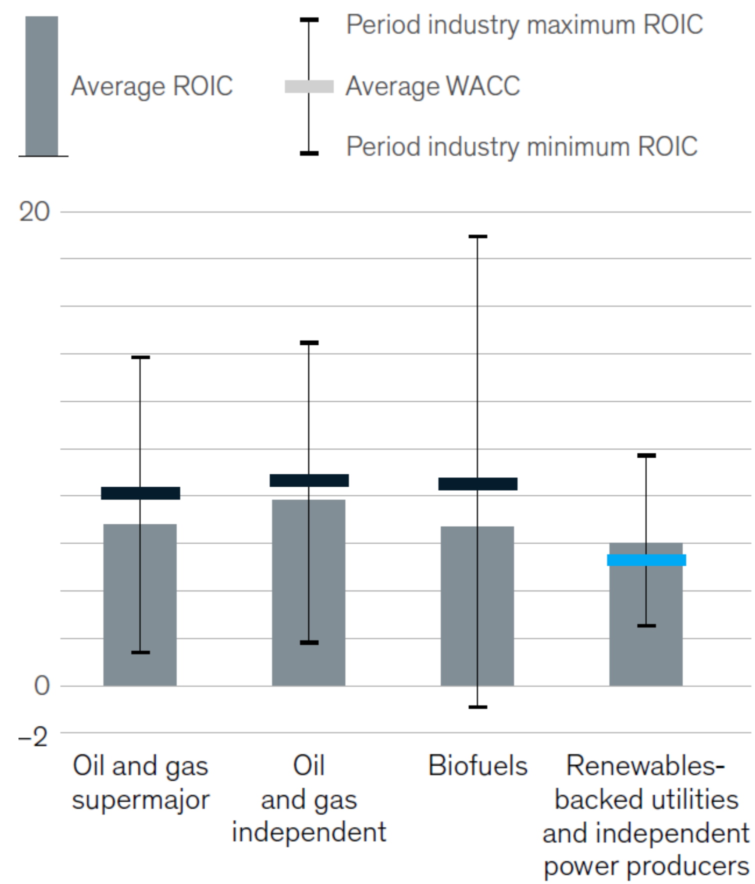
Exhibit 4

% of production at specific break-even price (BEP) points in 2030, million barrels per day[1]



Average ten-year ROIC for industry, %

ROIC: Return on invested capital
WACC: Weighted-average cost of capital



[1] Includes existing and pre-FID fields. Includes crude and condensate oil, and excludes gas, NGLs, and other liquids (e.g., biofuels). Assumes Scope 1 and 2 emissions.

Interviewer – Exhibit 3 & 4 (4 mins)

DUKE FUQUA SCHOOL OF BUSINESS

Exhibit 3 & 4 Guidance:

- **Question 4**:
  - **Background**: Our firm's O&G experts have developed projections for crude oil prices through 2050. In addition, they have calculated average returns for low and high-carbon investments.
  - **Question**: What does this data tell us about SOC's current strategy?
- **Interviewer Guidance & Clarifying Info**:
  - **Exhibit 3: Candidate** should take note of projected prices in 2030 (per the prompt…focused on 10-year strategy through 2030) rather than using 2050 values.
  - **Exhibit 4: Candidate** should focus on aggregate breakeven prices for all types of O&G projects rather than getting bogged down by shallow water, conventional, etc.
  - **Driving Forward**: By wanting to calculate a breakeven analysis or NPV for renewable energy projects

Analysis:

- Basic insights
  - **Candidate** uses "Reference" line Exhibit 3 and approximates the crude oil price of ~$75 per barrel.
  - **Candidate** examines Exhibit 4 keeping $75 per barrel price projection in mind:
    - **Candidate's** left-hand-side takeaways: at $75 per barrel, 90% of projects will break even across the different resource types
- Second order insights
  - **Candidate** uses high/low oil prices on Exhibit 3 to perform sensitivity analysis in year 2030
  - **Candidate** examines Exhibit 4 and determines a little more than 26% of projects will break even at $37/barrel (low oil price scenario); 100% of projects under high oil price scenario of $135/barrel in 2030
    - **Candidate's** right-hand-side takeaways: Average returns are lower than the average cost of capital for most projects except renewables, so transitioning to renewables may be financially attractive
      - Drives toward wanting to calculate a breakeven analysis or NPV for renewable energy projects

Exhibit 5

Renewable energy options

	Technology (A to Z)	First Year Available	Avg. Size (MWh)	Avg. Energy Price ($/kWh)	CO2 Emissions (g CO2/kWh)	CapEx Cost ($/kWh)	O&M Cost (% of CapEx/MWh)
★	Battery storage	2021	50	$0.15	0	1,170	0.5%
	Biomass	2024	50	$0.15	20	4,080	1.5%
	Combined-cycle with 90% CCS	2023	375	$0.20	350	2,470	24.0%
	Combined-cycle--multi shaft	2023	1,100	$0.20	390	960	21.5%
	Combined-cycle--single shaft	2023	415	$0.20	420	1,080	19.0%
	Conventional hydropower	2024	100	$0.15	5	2,770	2.5%
★	Fuel cells	2023	10	$0.15	10	6,280	4.0%
	Geothermal	2024	50	$0.10	45	2,770	2.5%
★	Municipal landfill gas	2023	40	$0.15	100	1,570	6.5%
	Nuclear--light water reactor	2026	2,150	$0.15	15	6,030	14.0%
	Nuclear--small modular reactor	2028	600	$0.15	15	6,180	12.0%
★	Solar PV with battery	2022	150	$0.20	45	1,610	1.5%
★	Solar PV with tracking	2022	150	$0.10	45	1,250	1.0%
★	Solar thermal	2023	115	$0.10	25	7,120	2.0%
	Ultra-supercritical coal (USC)	2024	650	$0.15	1,000	3,670	22.0%
	USC with 30% CCS	2024	650	$0.15	900	4,550	20.0%
	USC with 90% CCS	2024	650	$0.15	600	5,860	18.0%
★	Wind	2023	200	$0.10	15	1,850	1.0%
	Wind offshore	2024	400	$0.10	10	4,360	1.5%

★ High interest projects

Interviewer - Exhibit 5

DUKE FUQUA SCHOOL OF BUSINESS

Renewable energy options

Technology (A to Z)	# Assets Needed (for 0.5 GW goal)	CapEx Cost ($ dollars)	Energy Capacity (MWh)	O&M Cost ($ per year)	Est. Energy Rev. ($ per year)	Breakeven (# Years)
Formulas/Solutions	500 MW (0.5GW) / Avg. Size (MW)	Avg Size * 1000 kWh to MWh * CapEx Cost ($/kWh) * # Assets Needed	Avg Size * # Assets Needed * 24 hrs * 365 days	Energy Capacity (MWh) * O&M Cost (% CapEx/MWh)	Avg. Energy Price ($/kWh) * 1000 kWh to MWh * 24 hrs * 365 days * Avg Size * # Assets Needed	CapEx Cost ($ Dollars) / [Est. Energy Rev ($ per year) - O&M Cost ($ per year)]
Battery storage	10	-$585 M	4.4 M	$22 K	$438 M	2
Fuel cells	50	-$3,140 M	4.4 M	$175 K	$657 M	5
Municipal landfill gas	13	-$816 M	4.6 M	$296 K	$683 M	2
Solar PV with battery	4	-$966 M	5.3 M	$79 K	$1,051 M	1
Solar PV with tracking	4	-$750 M	5.3 M	$53 K	$526 M	2
Solar thermal	5	-$4,094 M	5.0 M	$101 K	$504 M	9
Wind	3	-$1,110 M	5.3 M	$53 K	$526 M	3

Candidate should use the data on Exhibit 5 (previous page) to calculate the number of assets (plants/projects) needed, total CapEx cost for those plants, etc. until they are able to calculate the breakeven number of years.

While the *Solar PV with battery* option is the optimal choice based on the number of breakeven years, a candidate could choose another project so long as their reason(s) for selecting the project are structured and sound.

Interviewer – Exhibit 5 (6 mins)

DUKE FUQUA SCHOOL OF BUSINESS

Exhibit 5 Guidance:

- **Question 5**:
  - **Background**: SOC's CEO recently read a report by BloombergNEF (New Energy Finance) showing that wind or solar are the cheapest forms of new-build energy generation in most markets—covering 66% of the world's population and 77% of global GDP.
  - **Question**: The CEO wants to announce a commitment of generating half a gigawatt (0.5 GW) of alternative energy by 2023. Current forecasts suggest SOC will be able to sell all its alternative energy capacity to eco-conscious businesses like Amazon. Which type of alternative energy solution should SOC pursue, why should they pursue it, and how long will it take to break even?
- **Clarifying Information** to provide candidate only if asked:
  - Energy power: measured in units (watts) per hour. I.e., 10 100W light bulbs turned on for one hour uses 1 kWh (kilowatt-hour)
    - 1 gigawatt-hr (GWh) = 1,000 megawatt-hrs (MWh)
    - 1 megawatt-hr (MWh) = 1,000 kilowatt-hrs (kWh)
  - O&M = Operations & Maintenance (variable cost)
  - Focus on identifying one type of project/technology and scaling that project to meet the 0.5 GW goal
  - $120M to $250M can be thought of as revenues or positive cash flows
  - Most of SOC's electricity assets are "Combined cycle" plants emit ~400 g CO_2/kWh on average

Analysis:

- Basic insights
  - **Candidate** should communicate a structure/approach for using the data in the table to answer the question before calculating anything.
  - **Candidate** should identify the "First year available" and "CO2 Emissions" columns as two columns that can easily be used as filters to rule out projects/technologies that have a go-live year after 2023.
  - **Candidate** offers basic insights for why they selected one of the 7 projects that meet the 2023 go-live criteria.
- Second order insights
  - **Candidate** offers advanced insights for why they selected one of the 7 projects that meet the 2023 go-live criteria.
    - Example: of the projects, the solar PV with battery has the highest price per kWh, likely due to system reliability. Solar projects w/o batteries only produce energy when the sun is shining.

Interviewer – Conclusion (1 min)

DUKE FUQUA SCHOOL OF BUSINESS

Recommendation

- We are presenting to Sovereign Oil Co's Board of Directors in two days. What is your recommendation?

Risks and Next Steps:

- Risks:
  – **Technological disruption** – Buy/Build renewable options may become unproductive assets if solar PV or wind turbine efficiency increases significantly
  – **Global and/or domestic carbon taxes** - crude oil breakeven calculations exclude prices with carbon tax
  – **Employee turnover/retraining/layoffs** – Moving to alternative energy production may result in job losses for employees across the value chain (e.g., deep water drilling, fracking, etc.)
- Next Steps:
  – Research potential low-carbon renewable acquisition targets
  – Explore internal capabilities to build low-carbon assets
  – Examine market and customer preferences to determine who potential customers would be

Entertainment Co.

Industry:	**Media**
Case Type:	**Profitability**
Led by:	**Interviewer**
Case Level:	**Expert**

This is meant to mimic a Bain style case

Behavioral Questions

Question 1:
What does DEI (diversity, equity, and inclusion) mean to you, and how have you explored this in your past roles?

Question 2:
What would you look forward to contributing outside of your role to the firm?

Entertainment Co.

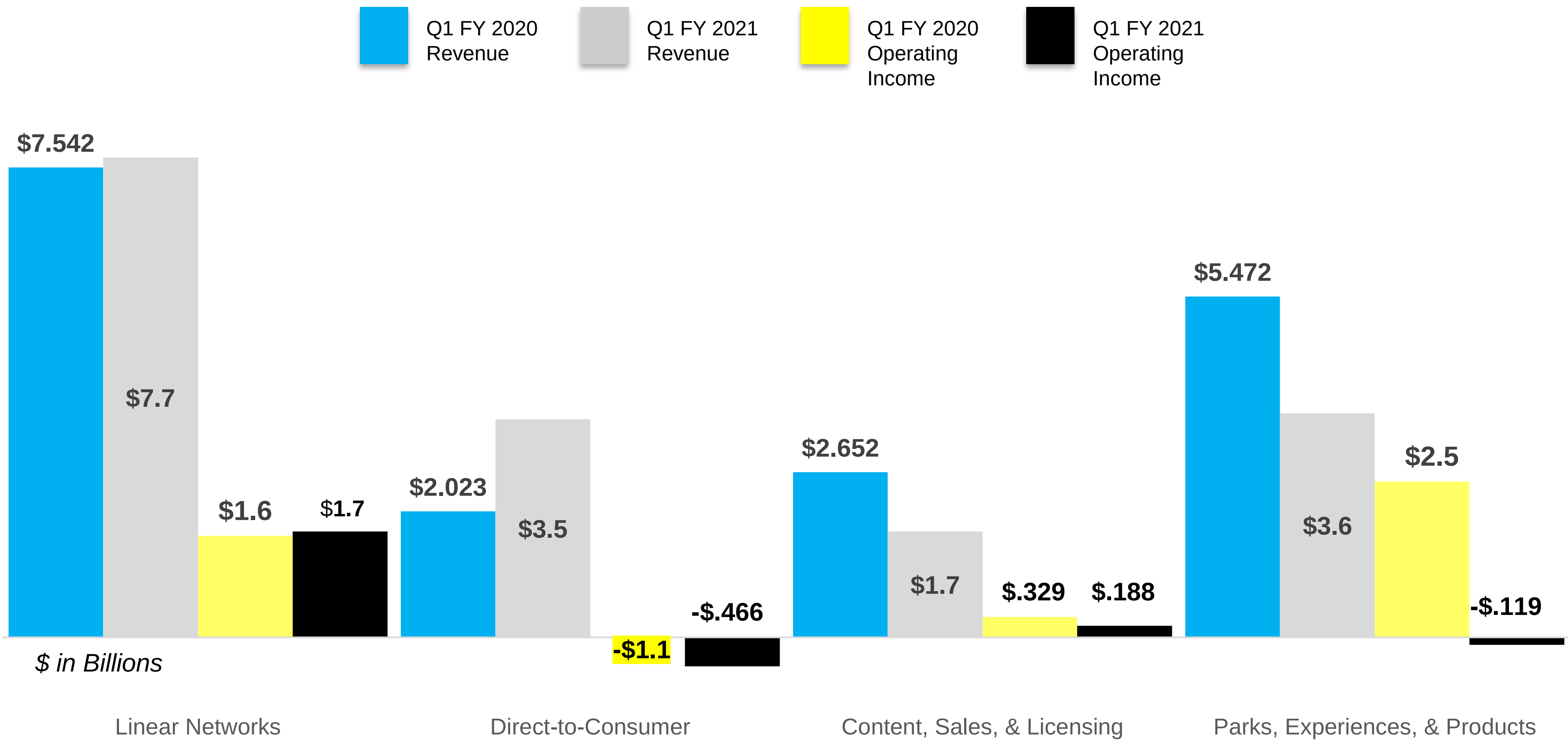
Prompt #1:

Entertainment Co is the leading, diversified global media company, specializing in family entertainment. Recent earnings reports show Entertainment Co's. post-covid revenue is slow to return to pre-pandemic numbers, with Box Office and park closures disrupting the traditional profitability model for the company. In addition, the parks & resorts (tourism) arm of the company has faced even greater challenges with temporary closures disrupting revenue streams, as tourism is regularly seen as the second most profitable segment to feature films. Investors are highly concerned about the pandemic's long-term effects on Entertainment Co. The CEO of Entertainment Co. has hired your firm to address a turnaround strategy helping Entertainment Co. increase profitability by 125% in 2 years from last FY net income of $17M

Case Background:

- Client/Company information – If candidate asks about 'how company makes money' or client business segments – share Exhibit 1
- Industry/Competition information – Industry is TMT, B2C, competition includes other media companies that include media distribution, production, and tourism (think NBCUniversal).
- Product information – If candidate asks, share Exhibit 1. DTC division recently expanded market share in FY 2020.
- Value Chain/Revenue information - If candidate asks, Exhibit 1
- **Any constraints on the case – Candidate should be able to calculate $21.5M as new profit goal (4.5M cost reduction or revenue increase)**
- **Note that this case displays an exhibit before the framework**

Alt Exhibit #1



Interviewer guidance on Exhibits

DUKE FUQUA SCHOOL OF BUSINESS

Exhibit #1 Guidance:

- Exhibit #1 is the breakdown of business segment, revenue and operating income between Q1FY 2020 and Q1 FY 2021.
- The second graph below is the % share of revenue and operating income by business segment for FY 2021.
- The goal of this segment is to help the candidate gain more information about the company's financials, pre-pandemic, and during the pandemic.
- Guide the candidate towards the insights on the right, if the they do not do so on their own.
- This should be a brief 2 min before asking the candidate to draft their framework.

Analysis:

Analysis for the exhibit to have 2 parts –

- Basic
  - Parks, Resorts, & Experiences are suffering the most post-pandemic, as both the revenue declined substantially, as did the operating income
  - While DTC was still incurring an operating loss, it improved from 2020, and revenues increased
- Second order insights
  - **Parks, Resorts, and Experiences faced the largest delta in revenue and operating loss, between FY 2020 and FY 2021 Q1** (34% decrease in revenues and 114% decline in operating income).
  - **Let candidate speculate on this insight to drive framework (Isolating on the difference in operating expenses and additional costs could help explain the steep decline).
  - Operating loss for DTC improved by 57% between FY 2020 and FY 2021, as revenues increased by 73%.
  - **Let candidate speculate this secondary insight to drive their framework (It could be speculated that provided the landscape in DTC, if Entertainment Co. had recently invested in this division, a larger upfront cost could be responsible for the initial operating loss).

<u>After the framework, candidate should request to steer the case towards examining costs in the parks & resorts arm of the company. If not, please direct candidate there.</u>

Entertainment Co.

Framework Buckets:

#1 Reduce Costs

1. Examine costs for each business segment
2. Isolate segment with largest costs (from Exhibit #1, the candidate should consider beginning with the parks & resorts segment, considering its $119M operating loss in recent quarter)
3. Determine most appropriate solution towards costs reduction that aligns with corporate values at Entertainment Co., trajectory of the market in the industry, and impact that this reduction will have on profitability.
   - Example could include layoffs from parks & resorts segment (con: reduces company morale and brand image), outsourcing most expensive operating costs (con: could come with the challenge of reducing overall quality, time delays for completion if international, additional government regulation, etc.**this is the direction the case will ultimately go), or / re-evaluating current supplier / vendor partnerships (con: dismantling existing relationship with supplier could hurt company morale

#2: Increase revenues

1. Increase prices (a strong candidate would consider which segment be most beneficial to increase prices provided pandemic and post-pandemic landscape, which could be via tourism prices ie. parks / resorts or subscriber fees for direct-to-consumer subscriptions)
2. Grow customer market share (observe market opportunities for expanding to new customer segments / demographics for particular business segment – likely direct-to-consumer streaming)
3. Increasing subscription options (a strong candidate could consider opportunities for bundling to increase the quantity sold, for example, expanding linear cable + direct-to-consumer bundles)

#3: Grow IP through acquisition

1. Identify opportunity cost for acquiring media to immediately increase revenues (ie. Smaller media company).
2. Identify way to reduce costs by acquiring or partnering with third party who can accomplish the specific business segment cheaper (*this is the direction the case will later head, let candidate discover on own)

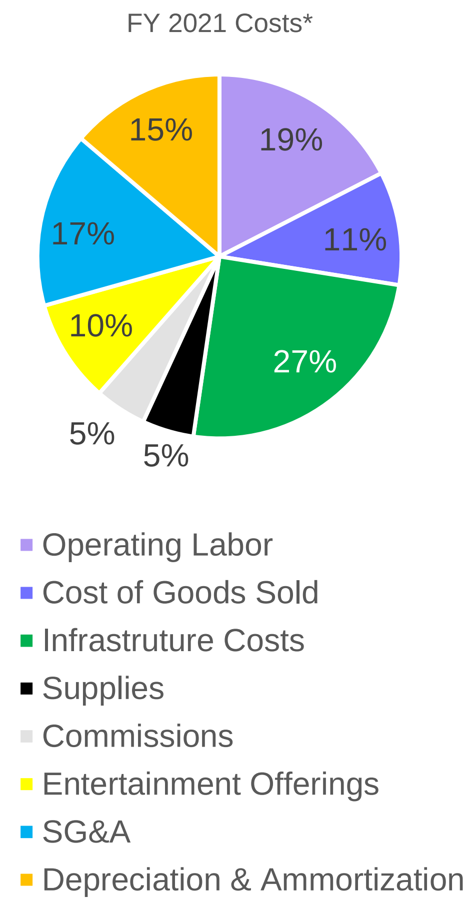
Framework should be highly tailored towards Parks, Experience and Products (PEP)

Drive towards cost reduction of PEP

Exhibit #2

Operating Results for Entertainment Co. 'Parks, Experiences, & Products

(in millions)	January 2, 2021	December 28, 2019
Operating expenses	(2,430)	(3,703)
SG&A	(678)	(758)
Depreciation and amortization	(591)	(594)



Interviewer guidance on Exhibits

Exhibit #2 Guidance:

- Candidate should be able to interpret the revenues / costs attributed to the PEP group, and should pay particular attention to the PEP costs within the segment. A strong candidate will realize that the largest costs are associated with ‘infrastructure’ costs, and should be able to solve for how much this equals (27% * (2430m+678m+591m) = .27*3699m = approx. 1B
- Allow / ask candidate to round to get to reasonable number.
- If candidate provides you the segment costs # ($1B), but does not drive the case, ask what additional information he or she thinks necessary to dig deeper.
- Help candidate realize a breakdown of infrastructure costs would be helpful (provide % that each segment makes up infrastructure costs on the right, and let candidate solve for infrastructure costs, and realize that **repairs or systems should be the next step to explore based on their higher segment %. (direct candidate to systems though).**

Drive towards information systems expenses

Analysis:

- Analysis for the exhibit to have 2 parts –
  - Basic
    - Candidate should deduce that the greatest operating expense comes from infrastructure costs
    - Candidate should notice that infrastructure costs are accounting for majority of costs, solve for overall infrastructure cost, then ask for breakdown of infrastructure segment costs.
    - Infrastructure cost = .27(3699)= 998 (*round to 1000)* = *$1B*
  - Second order insights
    - <u>Candidate should ask for cost breakdown for infrastructure costs. Lead them there if they do not.</u>
      - When asked:
      - Information systems expense (30%) (= .3 * $1B = $300M)
      - Repairs and maintenance (30%)
      - Property taxes (10%)
      - Utilities and fuel (5%)
      - Retail occupancy costs (10%)
      - Insurance (15%)
      - Transportation (5%)

Candidate should suggest exploring information systems expenses or repairs categories as means to cut costs. Direct candidate towards information systems if not suggested.

Exhibit #3

DUKE FUQUA SCHOOL OF BUSINESS

IT Spend Comparison

Segment	Entertainment Co. Information Systems	Magic Systems LLP*
Software engineering labor	45%	70M
Design labor	15%	10M
Materials	10%	5M
Cloud storage	15%	5M
Security	5%	5M
Maintenance / Repairs / Updates	10%	5M

*Magic Systems shares outstanding 3M, share price $35
**TSA would include 6 months of off-boarding Entertainment Co.'s Information Systems in Year 1

Interviewer guidance on Exhibits

DUKE FUQUA SCHOOL OF BUSINESS

Exhibit #3 Guidance:

- Share with candidate that Entertainment Co is considering acquiring small off-shore firm ‘Magic Systems LLP, to substitute as information systems for Ent. Co. This would replace current internal system.
- Table compares keeping internal information systems or acquiring third party firm (Magic Systems LLP) to perform the same task.
- Lead candidate towards calculating how much could be saved (or lost) by acquiring Magic Systems. The candidate should be able to ID if the number is less than 21.25M saved in two years, Ent. Co should not buy the company.
- A strong candidate will follow-through with the calculations on the right, and realize that acquiring Magic Systems LLP will be successful in reaching goal (if revenues remain the same), of increasing profitability by 125% (21.25M)

Analysis:

- Analysis for the exhibit to have 2 parts –
  - Basic
    - Information Systems at Entertainment Co. ($300M – from last exhibit)
    - Software engineering labor (45% x 300M = 135M)
    - Design labor (15% x 300M = 45M)
    - Materials (10% * 300M =30M)
    - Cloud Storage (15% x 300M = 45M)
    - Security (5% x 300M =15M)
    - Maintenance / Repair / Updates (10% x 300M =30M)

    Compares to Magic Systems to see where they could save.
  - Second order insights

    <u>A strong candidate will ignore calculating the above, and observe how much Magic costs total, deduct that from 300M to see how much the savings is after two years.</u>

    Total cost for Magic Systems is 100M annually.

    Valuation calculation = # of shares outstanding * share price

    Year 1 costs w/ acquisition: valuation (3M * $35 = $105M) + costs of 6 month off-boarding Ent Co. per TSA (.5 * 300M = 150M), + 6 months of Magic (.5*100 = 50M) = 305M

    A good candidate will know that year 2 would save (300M – 100M) = 200M

    So the overall savings would be 195M in 2 years, which surpasses the 21.25M.

Entertainment Co.

DUKE FUQUA SCHOOL OF BUSINESS

Recommendation

- Recommendations should restate the prompt, that the goal is to increase profitability by 125% in 2 years, so reducing costs by 21.25M or increasing by the same in revenues, provided the other stays the same. Provided the nature of the Covid-19 pandemic, the best method for achieving this is by reducing costs, particularly in the PEP segment, in the ‘information systems group.’ Specifically, outsourcing and acquiring information systems group ‘Magic Systems LLP’, which would achieve a net savings in 2 years of 195M.

Risks and Next Steps:

- Potential risks are that this is a new relationship, and more costs may be assumed, including time to perform tasks (especially if an international company), decrease in quality due to reduction in costs, possible delay in materials supplies international location and parts delays in the pandemic, additional taxes like tariffs etc.

- Revenues may still miss their quarter targets, therefore disrupting the number necessary to achieve a profitability increase of 125% might be too high, and unachievable through this acquisition.

- For next steps it would be recommended to perform a greater diligence on the company, do a greater valuation on the information systems market, as well as the tourism / media markets as a whole, to see if there are less risky ways to reduce costs in case revenues do not remain consistent in next two years.

This is a very difficult case and meant to pressure test candidates to remain calm under stressful situations

Into the Unknown

Industry:	Healthcare
Case Type:	Growth
Led by:	Interviewer
Case Level:	Expert

Behavioral Questions

DUKE FUQUA SCHOOL OF BUSINESS

Question 1:

- What are three words your friends or former colleagues would use to describe you?

Question 2:

- Consulting can be a highly demanding job, what strategies do you use to manage your time wisely and make sure you can recharge when stressed?

Into the Unknown

DUKE FUQUA SCHOOL OF BUSINESS

Prompt #1:

Arendelia Pharmaceuticals is a fast growing, innovative pharmaceutical company that has developed best-in-class treatments for Frozen Heart Syndrome (FHS), a rare but devastating progressive disease that significantly shortens a patient's lifespan without treatment. Arendelia had $6.2B in revenue in 2020 and grew revenues 55% from 2019 to 2020.

Arendelia has hired your firm to understand whether or not its current growth is sustainable and what they should do to ensure long term growth.

Case Background:

- Client/Company information: US biopharmaceutical company founded in 1989 which focuses on delivering scientifically innovative treatments for diseases with high unmet need.
- FHS is typically diagnosed at a very young age and most eligible patients with healthcare coverage are treated with one of Arendelia's products. There are an estimated 100k total patients with FHS worldwide (70% in the US, 30% International). As this is a rare disease, YoY growth rates are correlated with population growth at ~1% annually.
- Industry/Competition information: Arendelia has a monopoly on the FHS market as they are the only product that treats the underlying cause of FHS rather than the symptoms. Competition is likely in the future but not a current concern.
- Product information: Arendelia sells 4 products to treat FHS each at 300k/year in the US and 100k/year internationally.
- Value Chain/Revenue information: Products are room temperature stable pills making them easy to ship/store. Patients take 1 pill 2x daily for their entire lives.

Into the Unknown

DUKE FUQUA SCHOOL OF BUSINESS

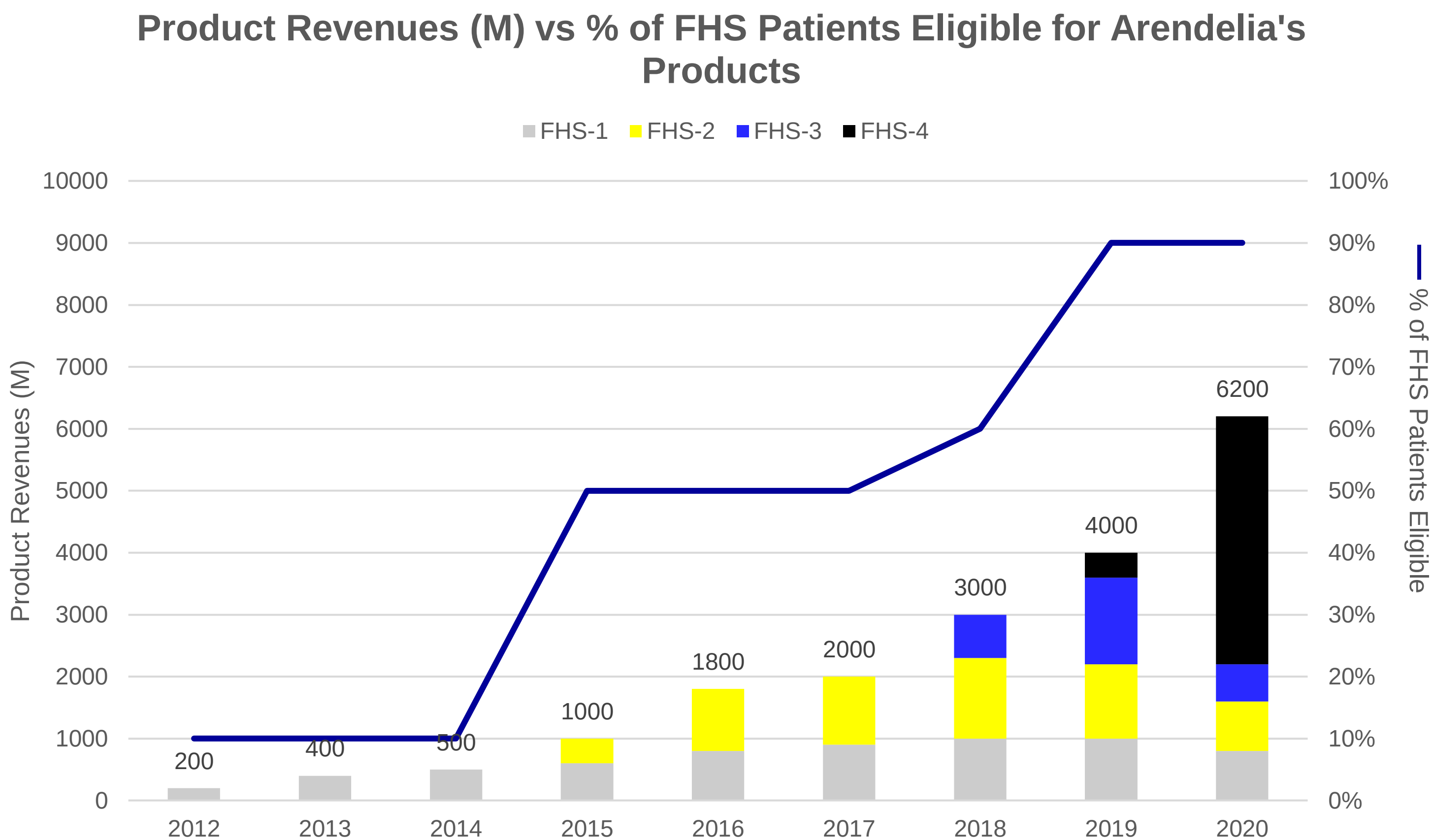
Framework Buckets:

- Given the revenue/growth focus of the prompt, profitability framework would not be appropriate for this case.

- Example Framework:
  - Organic Growth
    - Current products
      - Increase Price
      - Increase Volume
        - New markets
        - New customers
    - New Products
  - Inorganic Growth

Exhibit #1

If most eligible patients get on treatment within 2 years, are current revenue growth rates sustainable?



Interviewer guidance on Exhibit 1

Exhibit #1 Guidance:

The graph shows annual revenues for Arendelia Pharmaceuticals for the past 9 years and the percentage of total patients eligible for one or more of Arendelia's products.

FHS-1, FHS-2, FHS-3, and FHS-4 are Arendelia's four Frozen Heart Syndrome products launched in 2012, 2015, 2017, and 2019 respectively. There is no appetite for price increases due to public pressure/regulation.

Interviewer Guidance:

The candidate may be tempted to jump in and do a lot of math, BUT the key takeaway is that at 90% eligibility, there will be a plateau in FHS in the coming years. You can let them get to this conclusion without calculations.

Once they conclude growth is not possible from FHS alone, the candidate should suggest looking into other disease/product opportunities.

Analysis:

- Basic
  - Revenues have gone from ~200M to 6.2B over the 9 years shown
  - **% Eligible goes from 10% to 90% leaving only 10% potential additional patients in the future**
- Second order insights
  - % of treatable patients goes up each time there is a new product launched
  - Although they are not explicitly linked, the largest revenue increases are generally aligned with the year after launch as patients begin treatment.

Solution: It is technically possible to hit 55% growth in 2021, but it is highly unlikely **and there is not a large enough patient population to sustain current growth rates now that eligibility has hit 90%.**

Exhibit #2

Co-founders Anya and Isla agree that Arendelia needs to expand into other disease areas. The company has allocated $15B to invest in both R&D and M&A over the next few years. Which of the following products should they pursue?

Product	Disease Name	Phase	Synergy with Current Strategy	Projected Lifetime Product Revenue ($B)	Cost of development ($B)	Likelihood of Approval	Acquisition Price ($B)
A	Interfering Dragon Disease	2	High	20	5	50%	N/A
B	Acute Amphibian Disorder	1	Medium	20	4	25%	N/A
C	Fruit-induced Narcolepsy	3	Medium	10	2	75%	N/A
D	Sea Witch Laryngitis	3	High	20	4	75%	2
E	Pinprick Hypersomnia	1	High	50	10	25%	4
F	Scottish Bear Syndrome	2	Low	10	1	50%	2

No NPV calculations required

Interviewer guidance on Exhibit 2

DUKE FUQUA SCHOOL OF BUSINESS

Exhibit Guidance

- There is no wiggle room on the budget so the candidate's product prioritization must add up to less than $15B in spend
- You can assume market size and discount rates have already been factored into the projected lifetime revenue figure
- Acquisition price should be included in planning for the budget **however** it is a sunk cost once the decision to acquire or not has been made and therefore should not be included in expected value calculations.

Analysis:

EV = (Projected revenues - Development Costs)* likelihood of success + ($0 in revenue for failure - Development Costs)*(1-likelihood of success)

This equation may or may not be familiar to the candidate so if they are really struggling, you can guide them to the correct formula.

Product	EV Calculation	Total Cost (R&D + Acquisition) for Budgeting
A	(20-5)*.5 + (0-5)*(1-.5) = $5B	$5B
B	(20-4)*.25 + (0-4)*(1-.25) = $1B	$4B
C	(10-2)*.75 + (0-2)*(1-.75) = $5.5B	$2B
D	(20-4)*.75 + (0-4)*(1-.75) = $11B	$6B
E	(50-10)*.25 + (0-10)*(1-.25) = $2.5B	$14B
F	(10-1)*.5 + (0-1)*(1-.5) = $4B	$3B

Correct solution is select D, C & A (Total Cost = 6+2+5 = $13B) which will generate $21.5B in expected value (above) with upside of $50B in revenue (previous slide) if all are approved

Second level insights:

- Likelihood of success and phases are linked: Phase 1 – 25%; Phase 2 – 50%; Phase 3 – 75%
- Products B & D have identical projected revenues & development costs, but product D is already in phase 3 and much more likely to succeed
- Candidate will address risks to execution (regulatory, manufacturing, supply chain, etc.)

Brainstorming

DUKE FUQUA SCHOOL OF BUSINESS

Prompt:

- What should Arendelia consider before confirming their decision to branch out to other disease areas?
- If candidate already has gone into risks, ask to dive deeper into mitigating or solving something they said
- Additional questions given time / to pressure test candidate:
  - How else could they diversify revenue streams? (license, JV, sell IP)
  - What considerations should they look at for go-to-market? (Consider USA vs. international, reimbursements, supply chain)

Analysis:

Example Answer:

- Risks:
  - Unfamiliarity with the science/market in a new disease
  - Frozen Heart Syndrome patients may be concerned about losing Arendelia's single focus
  - Expanding too quickly could lead to internal resources (financial/personnel) being stretched too thin
  - Products chosen may not receive FDA approval
- Opportunities:
  - Allows for larger/faster growth
  - Diversifies the portfolio
  - Protects the firm from eventual competition in the FHS market and Loss of Exclusivity (LOE) on their FHS patents

Into the Unknown

Prompt

Anya and Isla have just returned from a trip touring their Orlando, Florida facilities and would love to hear your recommendation!

Recommendation

- Invest in disease areas beyond Frozen Heart Syndrome to maximize future growth
- Use the $15B allocated budget to invest in Products A, C, and D for an expected value of $21.5B and max potential revenue of $60B

Risks and Next Steps:

- There is a risk that the products we have chosen to pursue will not receive FDA approval or that the acquisition of Product D will run into difficulty.
- To mitigate those risks we recommend robust due diligence of the Product D acquisition and continuous monitoring of clinical data to make knowledgeable decisions for the greatest future growth of Arendelia.

This is a very difficult case and meant to pressure test candidates to remain calm under stressful situations

Shots, shots, shots[1]

Industry: Public Sector

Case Type: Strategy

Led by: Interviewer

Case Level: Expert

[1] Author does not have any material and non-public information pertaining to the state of Arizona contracting with any third-party management consulting organization during the COVID-19 pandemic. The state of Arizona was chosen for illustrative and educational purposes only. This case is fictitious and loosely based on a management consulting engagement provided by an unnamed organization to an unnamed client.

Behavioral Questions

DUKE FUQUA SCHOOL OF BUSINESS

Question 1:

- What does diversity, equity, and inclusion mean to you, and how have you demonstrated inclusive leadership?

Question 2:

- Tell me about a time you had to deliver bad news. What was your approach?

Shots, shots, shots

DUKE FUQUA SCHOOL OF BUSINESS

Prompt #1:

Our clients, the Governor of a state and the state's Director of the Department of Health Services (DHS), seek to improve SARS-COV-2 or "COVID-19" vaccination efforts in light of a new strain's proliferation. The B.1.617.2 variant—colloquially known as "Delta" —became the dominant COVID-19 variant in early July 2021 and has been observed to be more contagious than prior variants. According to researchers, unvaccinated individuals infected with the Delta variant will infect 3.5 or 4 other people (called "R naught" or "R0" in epidemiology). In contrast, people infected with the "Alpha" variant with had an R0 of 2.5. Thus, the Governor and Director seek to develop a plan to vaccinate 75% of the state-wide population by Labor Day 2021.

As of the beginning of August 2021, the state has vaccinated over 3,704,000 eligible adults and children aged 12+ with at least 1 dose of a COVID-19 vaccine (e.g., Johnson & Johnson/Janssen, Moderna, or Pfizer/BioNTech). Yet, millions more eligible adults and children aged 12+ have yet to receive a first dose of any vaccine.

The Governor and Director of DHS have hired us to help the state implement a large-scale COVID-19 vaccination program by standing up a COVID-19 vaccine data center to help increase vaccination rates and safeguard lives and livelihoods in the state.

Case Background:

- The Governor's secondary goal is to increase the state's rank for the percentage of its population aged 12+ with at least one dose of a COVID-10 vaccine
  - According to the Centers for Disease Control & Prevention, the state currently ranks 34^{th} in the U.S. (including states and territories)
- The state has enough supply of the J&J, Pfizer, and Moderna vaccines to vaccinate every eligible adult and child
- The U.S. Food and Drug Administration (FDA) granted emergency use authorizations (EUAs) for three vaccines: Johnson & Johnson/Janssen, Moderna, and Pfizer/BioNTech.
  - The J&J vaccine's course is completed after one dose, while the Moderna and Pfizer/BioNTech (mRNA) vaccines require two doses.
  - The Pfizer/BioNTech vaccine is the only vaccine available to be used for people aged 12-17. Adults 18+ can receive any of the three vaccines.
- The state's DHS is responsible for allocating vaccine doses to providers (e.g., hospitals, local pharmacies, Drs. offices, etc.) throughout the state. However, some providers also receive doses directly from the federal government (e.g., nursing homes, chain pharmacies, military/veterans, American Indian/Indigenous tribes, etc.).

Shots, shots, shots

Framework Buckets:

- Suggested framework: questions-based buckets are a differentiator. Framework should also have a bucket for risks/barriers

Strategies to target populations?

- Who is currently vaccinated and still needs to be?
  - Young children (12 - 17) → K-12 schools, parent or guardian education
  - Young adults (18 - 29) → Social media, higher ed. institutions
  - Adults (30 - 70) → Incentives and disincentives
  - Elderly (71 +) → Long-term care partnerships
  - → **Candidate** should move forward by asking for demographic data to understand which populations to target vaccination efforts to

Strategies to vaccinate populations?

- How will they be vaccinated?
  - Static sites → Host consistent vaccine availability
  - Pop-up sites & events → Partner with orgs to offer hyperlocal events
  - Medical care → Health providers offer in clinics, ERs, etc.
  - Employers/schools → Back-to-school vax events, mandates

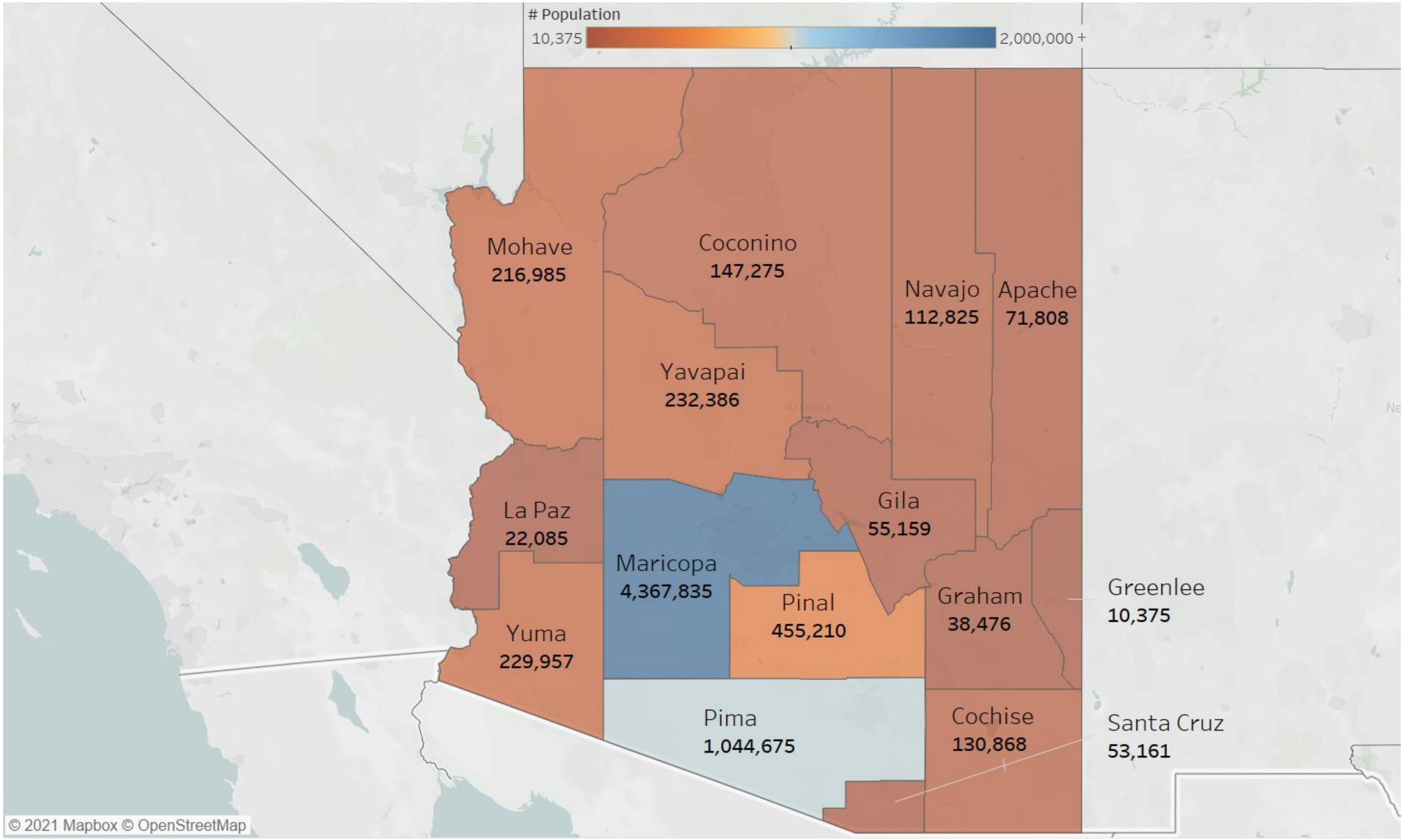
Next steps to address barriers?

- What are barriers to identifying and getting people vaccinated?
  - Access to vaccine at sites, events, etc. → Geo-analysis of pop density, vaccine supply
  - Vaccine misinformation and conspiracies → Targeted social media ads, local influencers
  - Lack of vaccine choice → Offer all vaccines at static and pop-up sites

Drive towards population

Exhibit 1

Population by county – 2020 estimates



Interviewer guidance – Exhibit 1

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Exhibit #1 Guidance:

- **Question 1**:
  - **Background**: The Governor and Director of DHS announced a goal of getting 75% of the state's population at least one dose of a COVID-19 vaccine by Labor Day 2021.
  - **Question**: How many people need to be vaccinated with at least one dose of a COVID-19 vaccine for the state to achieve the 75% coverage goal?

- **Interviewer Guidance**:
  - **Best approach**: Candidate should round the county-level population numbers, sum the county-level populations to get a state-wide population number, and multiply the state number by 75%
    - Mohave **217k** + Coconino **147k** + Navajo **113k** + Apache **72k** + Yavapai **232k** + La Paz **22k** + Maricopa **4,368k** + Gila **55k** + Yuma **230k** + Pima **1,045k** + Pinal **455k** + Graham **38k** + Cochise **131k** + Greenlee **10k** + Santa Cruz **53k** = <u>**7,189,080**</u>
    - <u>**7,189,080 * 75% = ~5,390,000**</u>
  - **Acceptable approach**: Candidate rounds each county-level population number, multiplies each by 75 percent, and then sums those numbers
  - *Estimate around 7M x 75% =* ***5.25M***

Analysis:

- <u>Basic insights</u>
  - **Candidate** asks what the current number of individuals vaccinated is
    - Interviewer: Approximately 3,704,000 individuals have received at least one dose, as mentioned in the prompt
- <u>Second order insights</u>
  - **Candidate** asks if the population numbers include all age groups.
    - **Interviewer**: Yes, all age groups are included despite the current COVID-19 vaccines only being authorized for the 12+ population
  - **Candidate** asks what the current number of individuals vaccinated is
    - **Interviewer**: Approximately 3.7M individuals have received at least one dose
    - **Candidate** calculates the state's current vaccine coverage rate of 52% (3.7M / 7.2M)
    - **Best approach** is to find difference (5.2M – 3.7M ~2M/7M ~ 28%) [25-28% acceptable range of additional population to cover
    - **Candidate** mentions how closing the gap and vaccinating the additional 23 pp. of people to get to 75% goal will be difficult due to vaccine hesitancy, vaccine resistance, etc.

Exhibit 2

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Vaccine coverage (at least 1 dose) and population distribution – by age group

% of population with at least 1 dose (5% – 70%)

County Name	Age Group 0 - 20	20 - 34	35 - 44	45 - 54	55 - 64	65 +
Apache County	24%	18%	21%	22%	27%	35%
Cochise County	17%	48%	55%	55%	62%	75%
Coconino County	20%	51%	69%	72%	74%	100%
Gila County	8%	30%	37%	41%	52%	70%
Graham County	12%	38%	50%	60%	76%	91%
Greenlee County	5%	29%	42%	48%	56%	71%
La Paz County	8%	18%	24%	32%	44%	51%
Maricopa County	17%	48%	57%	62%	73%	90%
Mohave County	6%	21%	28%	33%	45%	59%
Navajo County	18%	25%	32%	36%	45%	67%
Pima County	21%	54%	66%	69%	75%	94%
Pinal County	14%	36%	45%	57%	66%	79%
Santa Cruz County	36%	101%	104%	102%	94%	97%
Yavapai County	10%	31%	36%	40%	48%	71%
Yuma County	21%	55%	66%	74%	85%	72%

% of County Population by Age Group (8% – 39%)

County Name	Age Group 0 - 20	20 - 34	35 - 44	45 - 54	55 - 64	65 +
Apache County	30%	20%	11%	11%	13%	15%
Cochise County	24%	18%	11%	11%	13%	22%
Coconino County	27%	28%	11%	10%	11%	12%
Gila County	22%	14%	9%	10%	16%	29%
Graham County	30%	22%	13%	11%	10%	14%
Greenlee County	30%	21%	13%	11%	11%	13%
La Paz County	18%	13%	8%	8%	12%	39%
Maricopa County	27%	21%	13%	13%	12%	15%
Mohave County	19%	15%	9%	11%	16%	30%
Navajo County	29%	18%	11%	11%	13%	18%
Pima County	24%	21%	11%	11%	12%	20%
Pinal County	25%	19%	13%	11%	12%	20%
Santa Cruz County	30%	18%	11%	11%	12%	18%
Yavapai County	18%	14%	9%	11%	17%	32%
Yuma County	28%	22%	11%	10%	10%	19%

Exhibit 3

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Vaccine coverage (at least 1 dose) and number of unvaccinated – by age group

% of population with at least 1 dose: 5% – 70%

Unvaccinated: 0 – 50,000+

County Name	% 0 - 20	% 20 - 34	% 35 - 44	% 45 - 54	% 55 - 64	% 65 +	# 0 - 20	# 20 - 34	# 35 - 44	# 45 - 54	# 55 - 64	# 65 +
Apache County	24%	18%	21%	22%	27%	35%	16,505	11,618	6,072	6,340	6,785	7,151
Cochise County	17%	48%	55%	55%	62%	75%	26,528	12,669	6,494	6,160	6,571	7,249
Coconino County	20%	51%	69%	72%	74%	100%	31,708	19,995	5,073	4,212	4,377	-55
Gila County	8%	30%	37%	41%	52%	70%	11,090	5,568	3,013	3,367	4,228	4,730
Graham County	12%	38%	50%	60%	76%	91%	10,315	5,195	2,459	1,626	971	472
Greenlee County	5%	29%	42%	48%	56%	71%	2,950	1,560	814	613	518	403
La Paz County	8%	18%	24%	32%	44%	51%	3,739	2,430	1,356	1,271	1,559	4,294
Maricopa County	17%	48%	57%	62%	73%	90%	962,376	478,861	245,675	206,243	135,843	69,590
Mohave County	6%	21%	28%	33%	45%	59%	38,412	25,267	14,135	15,926	19,506	26,838
Navajo County	18%	25%	32%	36%	45%	67%	27,144	15,065	8,196	7,862	8,208	6,705
Pima County	21%	54%	66%	69%	75%	94%	197,093	104,390	40,982	35,481	32,788	12,588
Pinal County	14%	36%	45%	57%	66%	79%	97,222	54,638	32,645	21,727	18,537	19,854
Santa Cruz County	36%	101%	104%	102%	94%	97%	10,076	-66	-243	-96	392	308
Yavapai County	10%	31%	36%	40%	48%	71%	38,383	21,827	13,135	14,800	20,847	21,066
Yuma County	21%	55%	66%	74%	85%	72%	51,286	23,119	8,511	6,116	3,378	12,305

Interviewer guidance – Exhibit 2 & 3

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Exhibit #2 Guidance:

- **Question 2**:
  - **Background**: The Governor has asked the Director of DHS where to deploy state resources to increase 1st dose vaccination rates. The Director asks for your help to understand where the highest-need counties and age groups are.
  - **Question**: Which 5 age groups and counties would you recommend DHS target (e.g., Santa Cruz's 45 to 54-year-olds could be one recommendation, if warranted) to achieve the Governor and Director's vaccination goal?
- **Interviewer Guidance**:
  - **Best approach**: Candidate uses the *county-level population* data provided in Exhibit #1 plus the *% of county population by age group* data to estimate and identify the number of people vaccinated (or unvaccinated) by age and county
  - **Potential hypotheses** Candidate develops and clearly articulates a hypothesis/approach to identify the 5 recommended counties/ages.
    - Highest numbers of unvaccinated individuals
    - Lowest percent of population with at least 1 dose vs 75% goal
    - Highest numbers of unvaccinated 0 to 20-year-olds due to the COVID-19 Delta variant's increased severity among children

Analysis:

- Basic analysis
  - **Candidate** quickly flags values of interest:
    - Low coverage numbers highlighted in red
    - High/low population by age numbers highlighted in dark blue and dark orange
  - **Candidate** does not have a well-formulated hypothesis/approach; starts doing math accurately but without clear outcome in mind
  - **Candidate** flags and conceptualizes why some *% population with at least 1 dose* values may exceed 100%
    - **Note to Interviewer**: This occurs when the denominator, total population by age group, is smaller than the numerator, population with at least 1 dose
- Second order analysis
  - **Candidate** has a clear hypothesis/approach and structures their analysis to prove/disprove their hyp.
  - **Candidate** uses the data from Exhibit 1 and Exhibit 2 to estimate the populations of unvaccinated individuals by county and age group
  - **Candidate** starts by estimating the unvaccinated populations with the 2 largest counties; uses intuition to quickly rule out other counties and age groups
    - **Interviewer** to provide Exhibit 2b either if candidate asks or demonstrates proficiency with calculating unvaccinated population using Exhibit 2a

Interviewer guidance – Exhibit 2 – sample

County	Population	< 20	21 – 34	35 – 44	45 – 54	55 – 64	65+
Maricopa	Total Population 4,368k	27% * 4,368k = 1,180k	21% * 4,368k = 917k	13% * 4,368k = 568k	13% * 4,368k = 568k	12% * 4,368k = 524k	15% * 4,368k = 655k
	Unvaccinated Population	1,180k * (1 - 17%) = 980k	917k * (1 - 48%) = 477k	568k * (1 – 57%) = 244k	568k * (1 – 62%) = 216k	524k * (1 – 73%) = 141k	655k * (1 – 90%) = 65k
Pima	Total Population 1,045k	24% * 1,045k = 251k	21% * 1,045k = 219k	11% * 1,045k = 115k	11% * 1,045k = 115k	12% * 1,045k = 125k	20% * 1,045k = 209k
	Unvaccinated Population	251k * (1 – 21%) = 198k	219k * (1 – 54%) = 101k	115k * (1 – 66%) = 39k	115k * (1 – 69%) = 36k	125k * (1 – 75%) = 31k	209k * (1 – 94%) = 13k

For example, if candidate's hypothesis/approach is to find the largest number of unvaccinated individuals by age group and county, the 5 cells highlighted above are the age groups and counties they should identify.

Candidate should be evaluated based on their structured hypothesis/approach and ability to do quick mental math with uncommon percentages and base values.

Interviewer guidance - Brainstorming

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Prompt:	Analysis:
The Director of DHS and Governor agree with your recommended age groups and counties to target vaccination initiatives. How should the Director increase 1st dose vaccinations for these populations?	• Analysis of brainstorming to have at least 2 buckets. Sample answer shown below. The candidate should conclude their brainstorm by moving on to the conclusion/recommendation, including risks to increasing vaccination rates for the targeted populations. **Ensuring appropriate supply of vaccines** • Offer vaccines in locations: – K-12 schools – Via Community/faith-based organizations (churches, YMCAs...) – Chain/local pharmacies (CVS Walgreens, Wal-Mart, Albertsons) – On-site at large employers • Availability of different vaccines: – Vaccine choice – all three – Pfizer specifically for 12 to 17 pop. **Inducing demand for vaccines** • Marketing & awareness: – Vaccine events – Public places (groceries, transit locations, restaurants) – Targeted social media (geofencing) – Doctors' offices, urgent cares, ERs • Incentives/disincentives – Lottery system (like Ohio) – Discounted/free tuition – Unrestricted gift cards – "Passports" – mandate to access public venues

Interviewer guidance - Conclusion

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Recommendation

- The Governor is hosting a televised press conference in two hours to update the public on the targeted vaccination efforts. What is your final recommendation?

Risks and Next Steps:

- Risks:
  - Vaccine misinformation and politicization
  - No emergency use authorization or full approval for children < 12 yrs; only one vaccine for children 12 to 17
  - Focusing on the recommended age groups and counties may not be most equitable solution given socio-economic and racial/ethnic factors
  - Declining effectiveness of vaccines over time; need to plan for booster shots (3^{rd} doses of mRNA vaccines, 2^{nd} doses for J&J)
- Next Steps:
  - Booster shot planning for vulnerable populations (e.g., front-line health care workers, elderly, immunocompromised, etc.)
  - Booster shot planning for all eligible adults/children
  - Obtain race/ethnicity data to launch targeted initiatives and ensure equity in vaccine access + distribution
  - Engage local governmental officials, community leaders, medical providers, and influencers to boost vaccine awareness and access

This is a very difficult case and meant to pressure test candidates to remain calm under stressful situations

Final Remarks

Enjoy the casing process. This is very representative of the day-to-day life as a consultant!

It's important to mock case as if it were the real interview. The "day of" often brings additional stress and anxiety. Below are excerpts from students who previously interviewed at firms sharing their experiences and advice for future applicants.

- If something "unexpected" happens (interviewer skips framework, preemptively asks for brainstorm, etc.), don't panic. Adapt and respond accordingly
- Practice market sizing
- Identify and remember math shortcuts. Margin shortcuts, weighted average, price elasticity are all fair game
- Get clarity and background information. Easier said than done, but do not be afraid to repetitively ask for clarification if it is a novel or niche industry or company

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