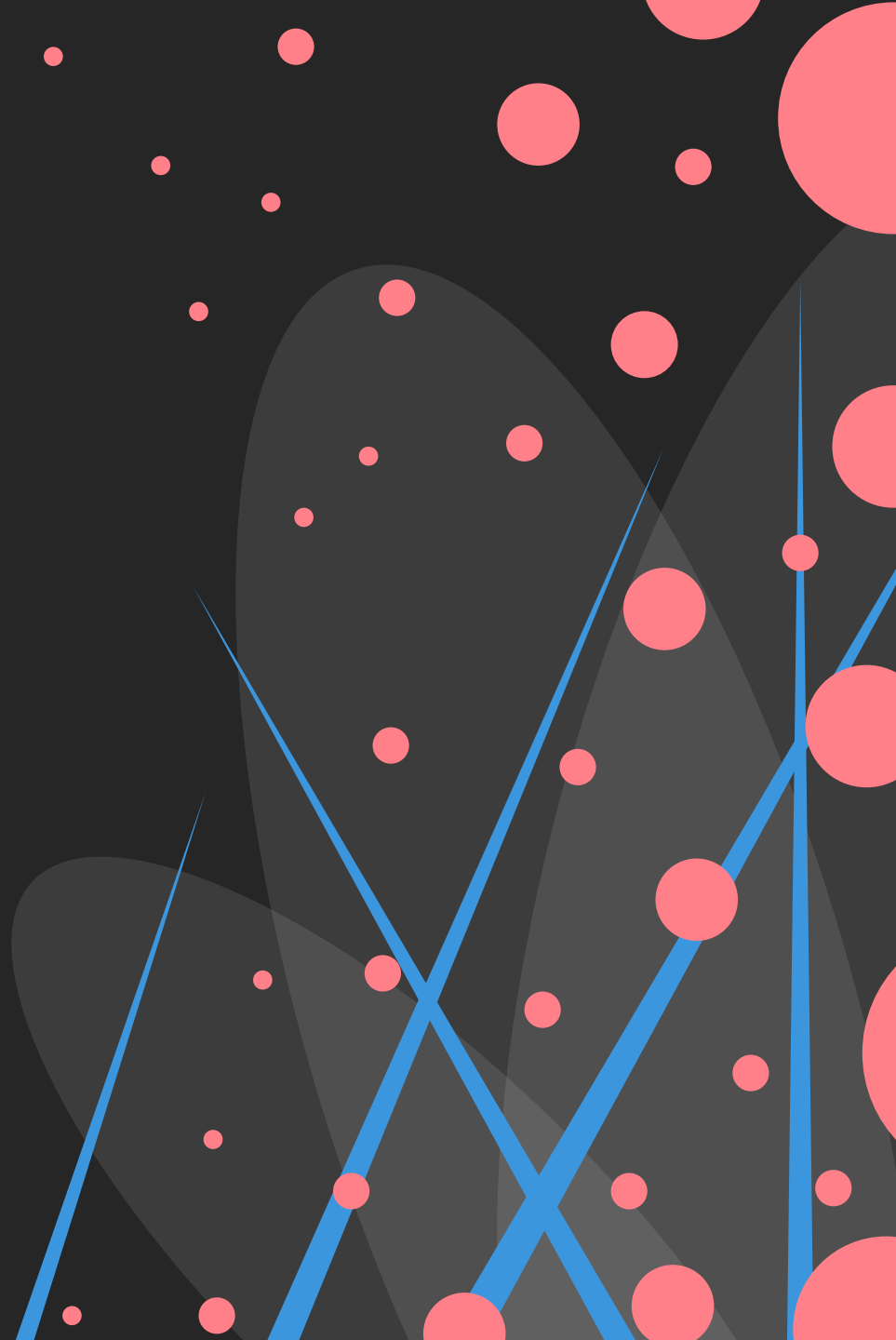
EDITION ONE

INSIDE THE MIND OF A CURIOUS CONSULTANT

A FRESH TAKE ON THE TRADITIONAL CONSULTING CASEBOOK

WRITTEN BY CHRISTIAN HUANG



So, what is a Casebook?

‘Inside the Mind of a Curious Consultant’ is a collection of real-life and fictional business case studies that explore the decision-making and problem-solving process through the perspective of a management consultant. These case studies are presented in the format of a Casebook, which acts both as a valuable resource for candidates preparing for consulting interviews, as well as a way for individuals to put themselves in the shoes of a consultant, and work through the problems as if it were a real-life project.

These cases are made to be completed in ~20-45 minutes sessions and test a candidate's ability to think critically, creatively, and in a structured manner, combining both qualitative and quantitative brain teasers. They are designed to be solved in a pair, with everyone taking turns to be the interviewer and interviewee. Worked solutions are provided for every question and can be used as a guide for identifying areas of improvement.

These cases span a wide range of industries and levels of difficulty, making this Casebook suitable for all levels of consulting expertise. Whether this is your first-time casing or a seasoned veteran, there will be a case that matches your understanding and abilities. This Casebook aims to highlight the exciting nature of problem-solving and make it accessible to everyone to develop and refine. This book will challenge the way you perceive problems, reveal new unique ways of thinking and help you overcome the blind spots that prevent you from thinking creatively and outside the box.

Ultimately, if you are curious about the world we live in and want to unlock the next stage of your critical thinking journey, this book is perfect for you.

So, why THIS Casebook?

It is no secret that there is a plethora of consulting resources and Casebooks that are available to the public, so what sets this Casebook apart from the rest?

Well, there are five key points of differentiation:

1

Unconventional

Each case encourages a different type of critical thinking that has not been explored in traditional Casebooks

2

Case Flow

Each case is structured in a logical story, which produces 'Aha' moments of realisation and satisfying conclusions

3

Interesting

No more niche and boring industries! Every case highlights a topic that most people have had experience with

4

Commentaries

Each case comes with a commentary section that highlights common mistakes and replicable critical thinking strategies

5

Fun

From the case presentation to the light humour, this book aims to make casing a fun and enjoyable experience

Each case has been tested multiple times with different interviewees, and these points show up consistently as the top five areas of positive feedback.

So, why THIS Casebook?

Furthermore, these cases have been tried and tested by industry professionals, with several MBB consultants providing strong words of recommendation and praise:

'Inside the Mind of a Curious Consultant' features problems that are exciting, nuanced and highly beneficial for anyone interested in management consulting. Each section of the casebook pushes the boundaries of a typical consulting case, and for that, I believe it is an invaluable tool for candidates looking to be anything but typical.

- Alan (BCG)

This is a great resource for candidates whether you're a beginner or more experienced! Christian does an incredible job of breaking down the basics whilst also challenging you with out of box scenarios and cases across a myriad of unique industries. I would highly recommend as a supplement to your preparations, a fantastic modern take on the traditional case interview handbook.

- Emily (McKinsey)

These cases were the perfect supplement to add variety to my preparation, given how fun and unique they are. I learnt new techniques by going through his cases and they have helped me think outside the box during my actual case interviews.

- Sarah (Bain)

Out of all the Casebooks I used in my preparation, this Casebook is by far the most fun and the best way to test not just your casing fundamentals and business acumen, but your ability to think through difficult problems on the spot. Through undergoing a variety of different industry areas and types of problem-solving, you will hone core skills like maths and frameworking, whilst developing a breadth of knowledge in so many cool areas! I cannot recommend the commentaries enough as well - Christian's extensive experience helping prep individuals has made him a clear expert in the field of case interviews.

- Celine (Bain)

'Inside the Mind of a Curious Consultant' differs from other casing resources out there - rather than just telling you what is right and what is wrong, it instead teaches you how to think like a consultant. As such, it prepares you for any potential scenario, industry, or case problem; this is vital for the unpredictability of a case interview. It helped me greatly in my preparation for consulting interviews and I highly recommend it to anybody looking to break into management consulting!

- Isabel (BCG)

These cases are all incredibly well thought out and rigorously test the requisite case interview skills regardless of whether you're starting out or are brushing up right before the big day. Highly recommended!

- Jack (MBB Offeree)

Okay, how do I use this Casebook?

There are a few ways to ensure that you get the most out of this Casebook. Collaboration from each party is essential for maximising the value out of the cases, and it is highly encouraged for everyone to work towards the following:

Casing Procedure Overview

Cases begin with the interviewer reading out the case brief. Interviewees can ask for any clarifying information before they produce their intended approach to solving the case (the framework). Afterwards, the interviewer and interviewee work through the following sections of the case, where the interviewee may be asked to solve numerical problems, brainstorm ideas, analyse exhibits for key insights, and ultimately produce a final recommendation (the synthesis). There are plenty of resources online that demonstrate this procedure, and it is recommended for both parties to familiarise themselves with this process before starting.

Interviewer

The interviewer has arguably the most important role when it comes to creating a fruitful casing experience. It is imperative for the interviewer to familiarise themselves with the entire case, ***ESPECIALLY*** *the answers before they begin the mock interview. Your role as an interviewer is to* ***GUIDE*** *interviewees to the right answer by giving them small hints and discussion cues pointing in the right direction. Commentaries about each case are provided specifically for interviewers who are unsure as to what key pieces of feedback to provide and areas to look out for. Also, keep note of what information should be given out to the interviewee.*

Interviewee

The most important thing for the interviewee to focus on is less on what the correct answer is, but rather ***HOW*** *the correct answer is produced. Focusing on proper technique and logic will ensure the development of a transferrable skillset that can be utilised for all types of problems and cases. These cases have been ordered in a way that working through them chronologically will result in the smoothest development and refinement of key skills. This Casebook should be used as a tool to identify areas to work on, rather than a checklist to complete. Supplementary exercises such as more live cases and drills are recommended.*

Writer's Address

Christian Huang
Author

Hello! My name is Christian, and I'd like to introduce myself and share a bit about why I wrote this Casebook and what it means to me. I am a final year student studying a Bachelor of Commerce at the University of New South Wales in Australia. I am part of the official UNSW Case Team and have travelled the world, competing internationally at the highest level in consulting case competitions. It has been through these experiences that I have developed a passion and curiosity towards critical thinking and problem-solving, and I have always been looking for a way to share this exciting world with the people around me.

Earlier this year, when I was helping my friends prepare for their consulting interviews, it appeared to me that all the Casebooks that were commonly being used were full of repetitive, poorly written, and frankly boring cases. Having understood the factors that make a case fun and satisfying to solve, I took it upon myself to write tailored cases for my friends to help make their preparation more fruitful and enjoyable.

As I expanded the number of cases, I became aware of the high barriers to entry for non-business background people looking to break into management consulting. I was determined to turn my Casebook into a resource that helps people of all ages and disciplines to develop the frame of thinking required to solve consulting case interviews.

150+ hours of case writing, case interviewing, and refining later, I have produced a piece of work I can safely say I feel proud and passionate about. This Casebook combines all I have learnt over the past few years and is a true reflection of how much more exciting the world around us can be when viewed through the perspective of a curious consultant.

I wish you all the best with your case preparation, and I hope you enjoy the journey along the way.

Case Index

Case #1

Ride the Wave

Difficulty

Outcomes Tested:

- Structured thinking
- Mathematics

Industry:

Entertainment

Brief

Your client is the Chief Operating Officer (COO) of Luna Park, a popular amusement park located in Sydney, Australia. They have recently opened a new rollercoaster called Jenson's Ridge, inspired by the steep mountainsides in Norway. The launch has been a huge success, with extremely long lines stretching down the park. Given its recent success, the COO is wondering if there are possible ways to increase the rollercoaster revenue and has come to you (Insert Candidate Name) Partners Ltd for help.

Clarifying Information

- *The COO is only interested in exploring ideas associated to Jenson's Ridge*
- *Revenue is a function of the number of tickets used at the rollercoaster multiplied by the price of each ticket (assume no multi-day passes, and one tier for ticket pricing)*
- *Tickets are $5 per ride*
- *There is always a wait (assume max capacity)*
- *The rollercoaster fits 20 people, with 10 rows of 2 seats*
- *Rollercoaster operates from 9am - 5pm*

Initial Framework

Candidate should recognise that this is a supply issue, not a demand one. Guide candidate to identify reducing ride duration and selling additional goods or services.

Exemplar Framework

- *Increase price*
  - *Sell additional goods or services (photos, going backwards, express pass)*
  - *Increase the ticket price*
- *Increase quantity*
  - *Increase people per ride*
    - *Fit in single admissions with other single admissions (utilisation)*
    - *Add more seats*
  - *Increase # rides in a day*
    - *Open for longer hours*
    - *Reduce ride duration (increasing speed, reducing wait time)* (candidate needs to produce this idea)

Q1 – Ride Duration

The COO is interested in seeing if there is any room to reduce the ride duration and has provided a breakdown of the ride duration.

Provide candidate with Exhibit #1.

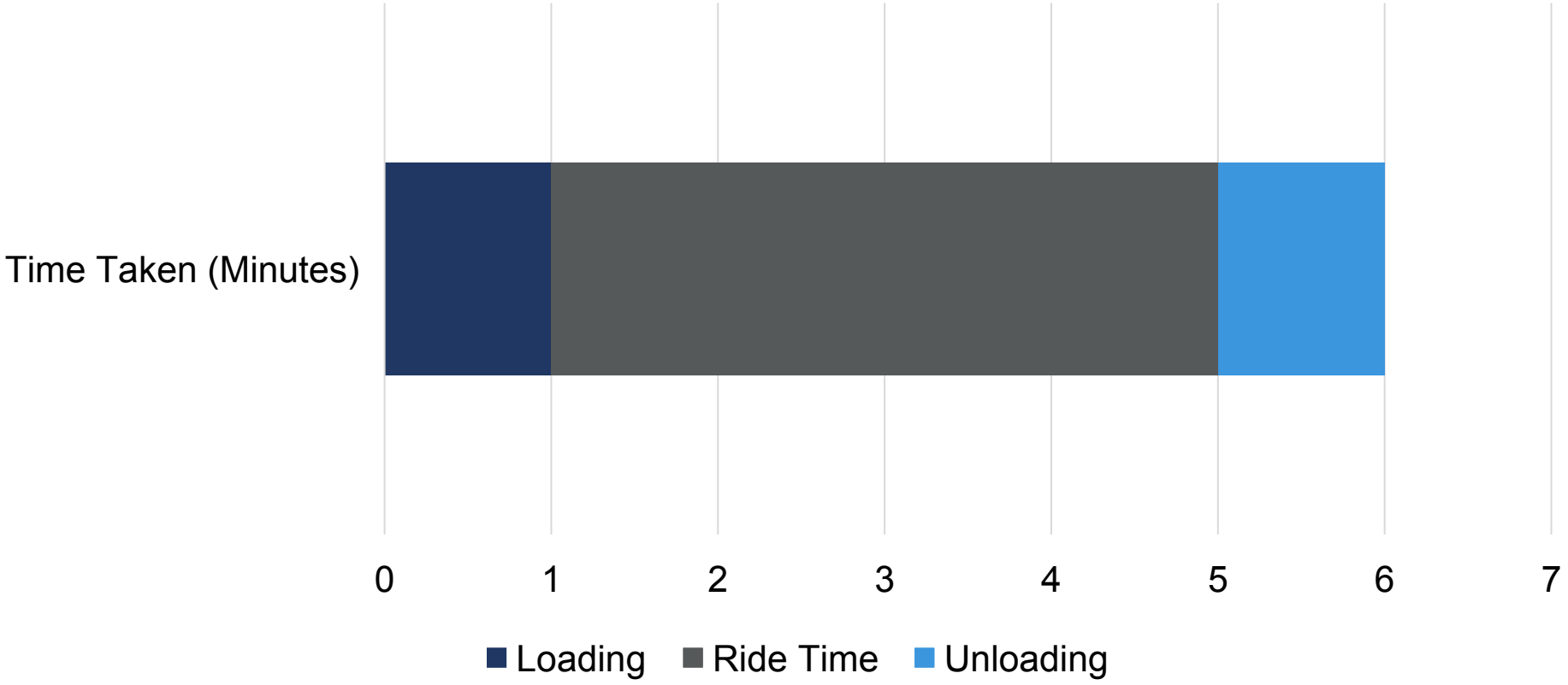
What are some ways to reduce ride duration?

Potential Answers

- *Reduce ride loading*
  - *Locker for items*
  - *Don't check seatbelts*
  - *Have people form into groups before walking up to the ride*
  - *Safety videos played during the queue*
- *Reduce ride time*
  - *Increase the speed of the ride* (candidate needs to produce this idea)
  - *Shorten the ride (single vs double loops)*
- *Reduce ride unloading*
  - *Have the rollercoaster slow down rather than come to a full stop, pressuring people to get off faster*
  - *Locker for items*

Exhibit #1 – Breakdown of Ride Duration

Figure #1 – Breakdown of Ride Duration



Q2 – Rollercoaster Go Vroom

If the COO were to double the speed of the rollercoaster, how much additional revenue will the rollercoaster make in a day?

Answers

- *Before + after approach*
  - *Before*
    - *6 mins per ride > 10 rides in an hour > 80 rides per day*
    - *20 people per ride > 1,600 total admissions per day*
    - *At $5 per ticket, $8,000 in revenue per day*
  - *After*
    - *4 mins per ride > 15 rides in an hour > 120 rides per day*
    - *20 people per ride > 2,400 total admissions per day*
    - *At $5 per ticket > $12,000 > $4,000 incremental revenue (50% increase)*
- *Incremental approach*
  - *Save 2 minutes per ride, with 80 rides per day, you save 160 minutes, which is an extra 40 rides*
  - *20 people per ride > 800 extra admissions*
  - *At $5 per ticket > $4,000 incremental revenue*

Q3 – Selling Photos

The COO realises that doubling the speed of the ride results in better reactions from the rollercoaster riders and is interested in selling photos. If one in every 10 riders buys a photo for $10, how much incremental revenue will the rollercoaster make in a day?

Answers

- *Top-down approach*
  - *4 mins per ride > 15 rides in an hour > 120 rides per day*
  - *20 people per ride > 2,400 total admissions per day*
  - *10% of people buy a photo > 240 photos sold per day (assuming everyone rides the ride once)*
  - *At $10 each > $2,400 incremental revenue*
- *Bottom-up approach*
  - *2 photos sold per ride > $20 per ride*
  - *With 120 rides in a day > $2,400 incremental revenue*

Synthesis

After completing the project, you reward yourself with a ride on Jenson's Ridge. When the safety bar comes down over your head, you realise that sitting next to you is the COO. Just as the COO asks you for a summary of the case, the rollercoaster jerks forward and begins ascending towards the first major drop. Before the rollercoaster reaches the apex, what will you tell them?

Potential Answer

- Doubling the speed of the rollercoaster will generate an incremental $4,000 in revenue per day
- Selling photos will generate an incremental $2,400 in revenue per day

Commentary

‘Ride the Wave’ is my take on the perfect case to begin one’s casing journey. It is easy to understand, uses simple and logical mathematics, allows for creative brainstorming, and includes simple chart reading. This case tests a candidate’s ability to think in a structured manner to maximise the chances of producing an exhaustive list of strategies.

This case has a few complexities that can lead to some common blind spots or inaccurate frameworking. The first crux is in the case brief, where candidates should deduce that the rollercoaster is experiencing a supply-side issue rather than a demand-side one. Since there are long lines, even if Luna Park were to increase the demand through means such as marketing or promotions, the revenue will still be limited to the capacity of the rollercoaster, which in this case is already maxed out.

Furthermore, if structured thinking isn’t applied in a MECE manner, it can be quite common for candidates to miss essential ideas such as increasing the speed of the ride, filling rides up to capacity or increasing operating hours. Another common mistake seen in less experienced casers is assuming that the ‘price’ bucket of a revenue framework only includes the price of the ticket, rather than thinking of it as a basket value. Under a basket value perspective, additional ideas such as selling photos or express passes can be generated.

Overall, ‘Ride the Wave’ is my go-to case for introducing casing to beginners, and a good walkthrough example used in casing workshops. Also, as a fun detail, the name Jenson’s Ridge is a reference to the name of our team mascot when competing in the 2023 Champion’s Trophy Case Competition held in New Zealand, and this case was written during our stay at an Airbnb in Auckland after the competition.

Case #2

A Wish Come True

Difficulty

Outcomes Tested:

- Mathematics
- Chart Reading

Industry:

Not-for-Profit

Case #2 – A Wish Come True

Brief

Your client is the lead volunteer at the Make-a-Wish Foundation, a not-for-profit organisation that grants wishes to children with critical illnesses. It has come to their attention that critically ill, 9½-year-old Hellen has a wish to cook for the one and only Gordon Ramsay on national television. Unfortunately, the budget for this year has been depleted, and new funding will be required to cover the costs and make Hellen's dream a reality. They have come to you (Insert Candidate Name) Partners Ltd asking what funding sources they should consider.

Clarifying Information

- *The client wants to hear your suggestion on funding sources before sharing their current revenue drivers*
- *Current estimates place the cost of providing Hellen's wish at $100K*
- *Reducing the cost of provision is not within the scope of the case*
- *Make-a-Wish Foundation typically covers the majority if not the entirety of the cost associated with providing their wishes*

Exemplar Framework

- *Individual and community donations*
  - *Regular donor plans*
  - *Online / offline donations (website, door-to-door)*
- *Corporate sponsorships*
  - *Business sponsorships/partnerships*
  - *Employee contributions*
- *Events/fundraisers*
  - *Charity gala dinners*
  - *Community engagement events (Runathons, food fairs, bake-offs, etc)*
  - *Challenges (social media, donation)*
  - *Revenue generation – selling goods or services*
- *Donations in kind*
  - *Goods and services*
  - *Volunteers*
- *Bequests*

Q1 – Door-to-Door Donations

The client wants to explore the first source of funding coming from individual donations mainly through door-to-door collections.

Provide candidate with Exhibit #1

How much funding can Make-a-Wish Foundation expect to receive from door-to-door collections? Is this sufficient?

Answers

- *Conversion rate of Door-to-Door fundraising: 1% (80% x 50% x 25% x 10%)*
- *Total houses visited in a day: 2,500 (250 x 10)*
- *Total houses donating per day: 25 (2,500 x 1%)*
- *Total raised per day: $1,250 (25 x $50)*
- *Total raised: $62,500 ($1,250 x 50)*
- *This is not sufficient, $37.5K short of the $100K goal*

Exhibit #1 – Door to Door Collections

Figure #1 – Sequential Probabilities with Door-to-Door Fundraising

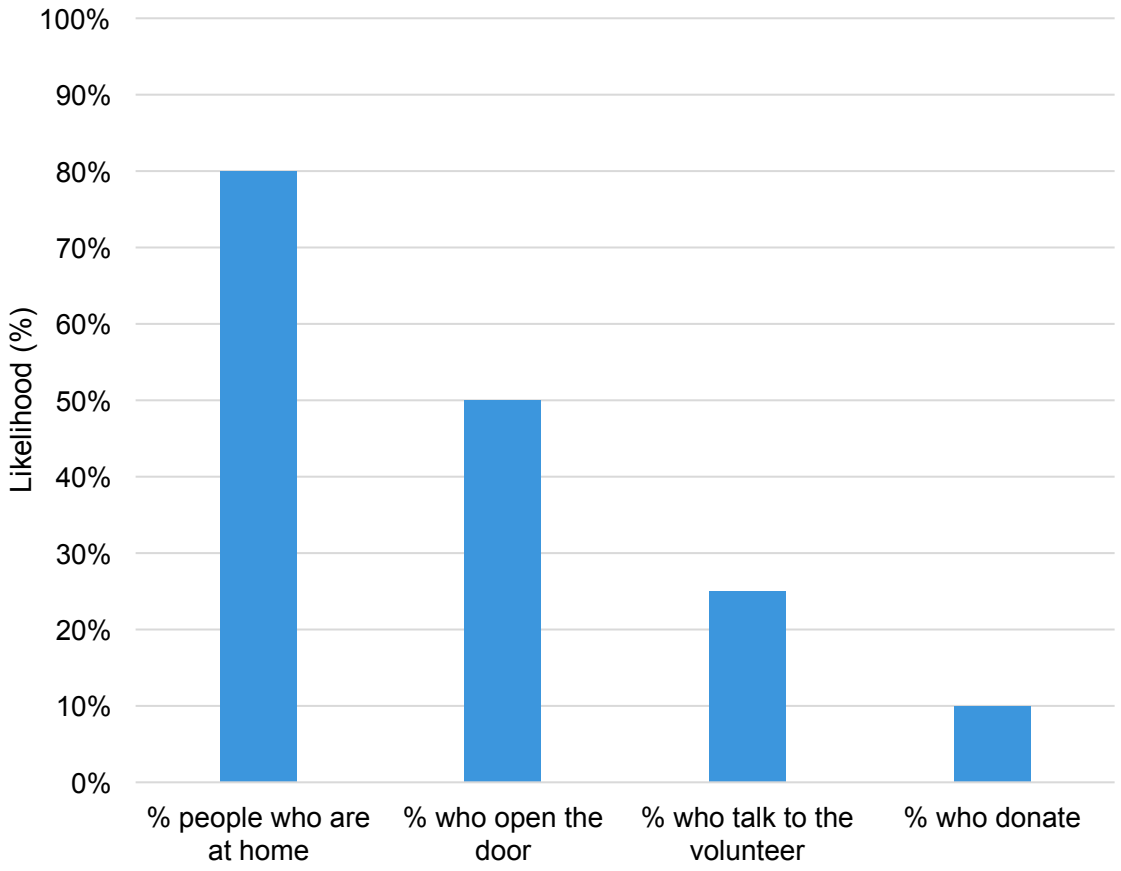


Figure #2 – Volunteer and Donation Information

Item	#
# Houses Visited per Volunteer per Day	250
# Volunteers per Day	10
Total # Volunteering Days	50
Average Donation Amount	$50

Q2 – Baked Goods Fundraiser

The client wants to explore the second source of funding by running a fundraiser event, selling baked goods such as cookies, cupcakes, and brownies.

Provide candidate with Exhibit #2

How much funding can Make-a-Wish Foundation expect to receive from selling baked goods? Is this sufficient?

Answers

- *Profit on Cookies: $4,000 ($1 x 4,000)*
  - *Margin on Cookies: $1 ($2 - $1)*
- *Profit on Cupcakes: $6,000 ($2 x 3,000)*
  - *Margin on Cupcakes: $2 ($3 - $1)*
- *Profit on Brownies: $7,500 ($3 x 2,500)*
  - *Margin on Brownies: $3 ($5 - $2)*
- *Total funds raised: $17,500 ($4,000 + $6,000 + $7,500)*
- *Still $20K short of the goal ($80,000 total raised with door-to-door and fundraiser)*

Exhibit #2 – Baked Goods Fundraiser

Figure #3 - Price and Cost Breakdown of Baked Goods

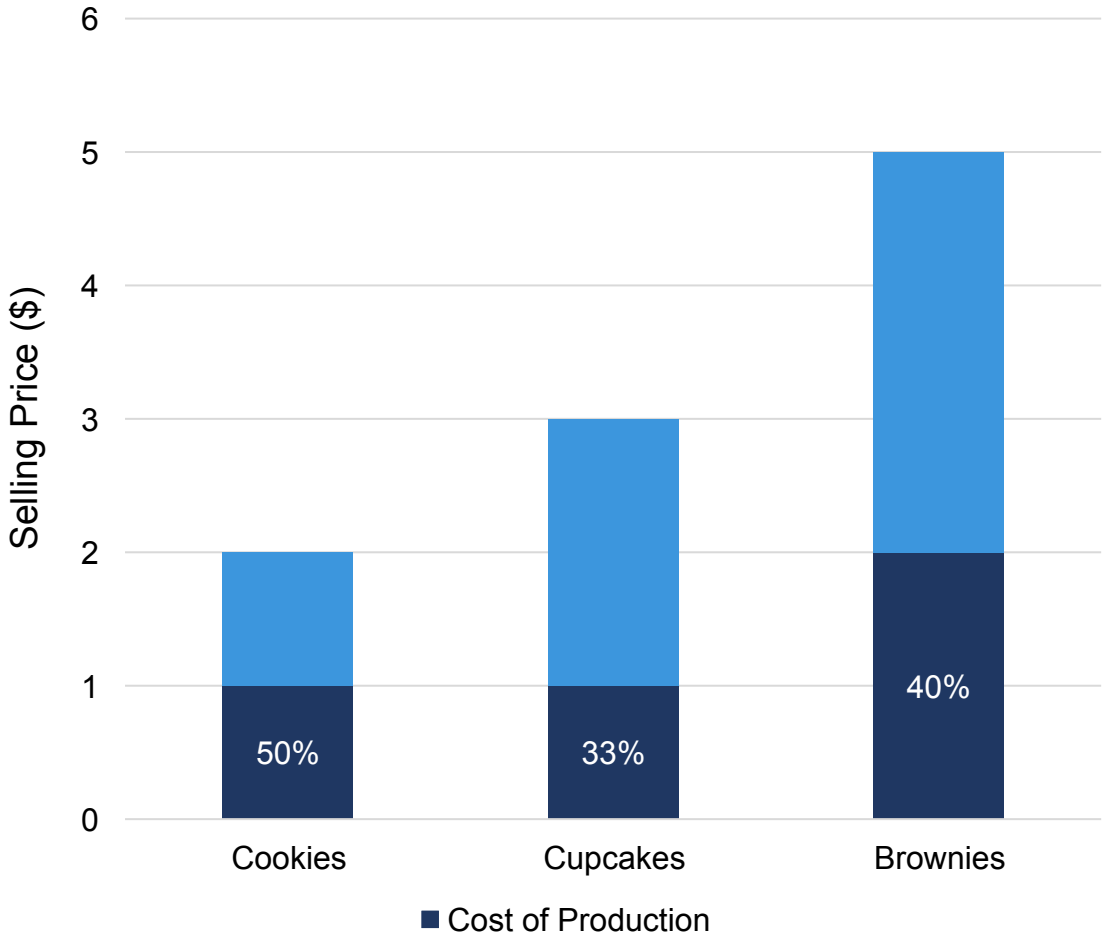


Figure #4 – Sales Volume

Item	# Sold
Cookies	4,000
Cupcakes	3,000
Brownies	2,500

Q3 – Corporate Sponsorships

The client wants to explore the third source of funding by seeking corporate sponsors. They can secure three large corporate sponsors.

Provide candidate with Exhibit #3

How much funding can Make-a-Wish Foundation expect to receive from corporate sponsors? Is this sufficient?

Answers

- *Make-a-Wish Foundation proportion of total funding: 5% (25% x 20%)*
- *Total CSR (Corporate Social Responsibility) spend across companies: $400K ($200K + $150K + $50K)*
  - *Note: Since the chart breaks down average spend, candidate can sum up all CSR spend*
- *Total corporate sponsorship: $20K ($400K x 5%)*
- *Total funding equates to: Door-to-Door + Baked Goods Fundraiser + Corporate Sponsorships = $100K*
- *This is exactly enough to grant Hellen her wish!*

Exhibit #3 – Corporate Sponsorships

Figure #5 - Corporate Sponsor CSR Spend Breakdown

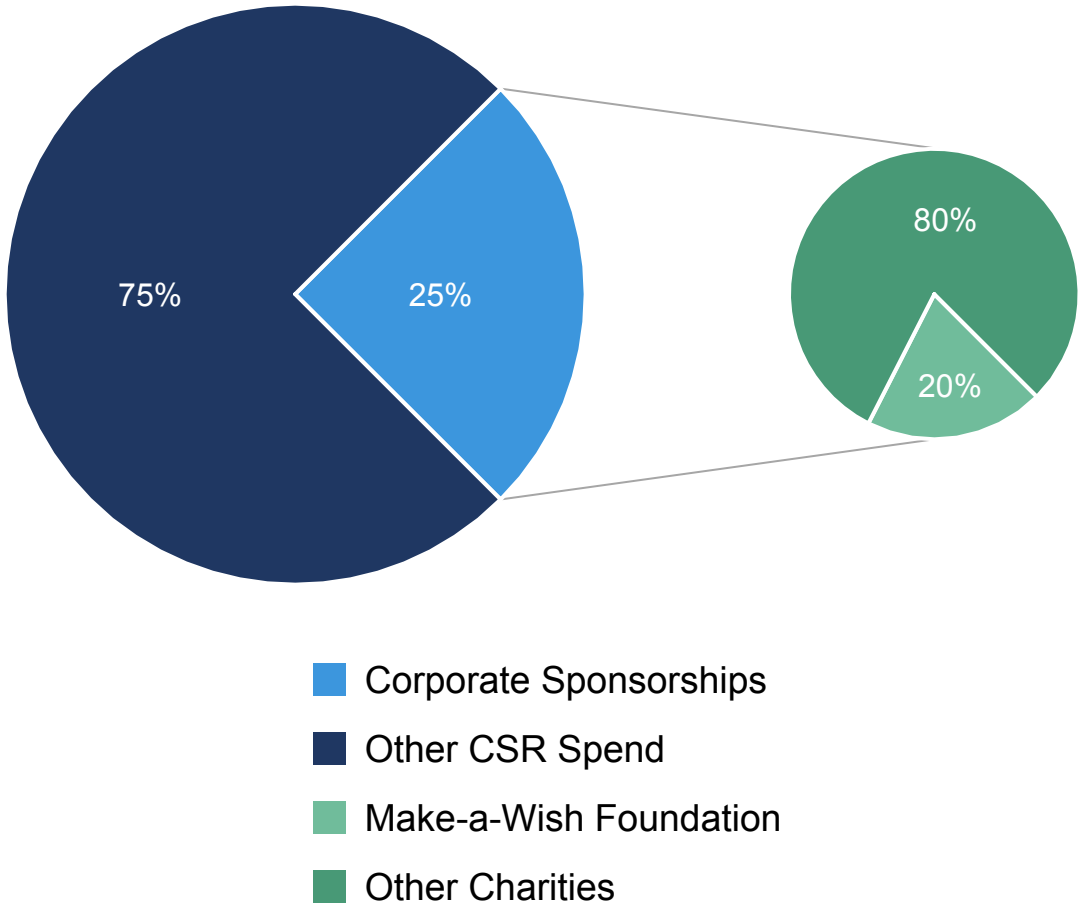


Figure #6 – Corporate Sponsor Total CSR Spend

Company	Total CSR Spend
McDonalds	$200K
Colgate Palmolive	$150K
American Express	$50K

Synthesis

After all your hard work, Hellen is finally able to have her spotlight on Hell's Kitchen. While she is preparing a main course for Gordon Ramsay, she forgets the lamb sauce. Gordon Ramsay is mildly annoyed, asking for the lamb sauce. You suddenly get a call from the head volunteer at Make-a-Wish Foundation, who asks for an update on the case. In the time it takes for Hellen to find the lamb sauce, provide a summary of your recommendation.

Potential Answer

- *Make-a-Wish Foundation will be able to source the necessary $100K in funding through door-to-door donations, a baking fundraiser, and corporate sponsorships*
  - *Door-to-Door donations will drive 62.5% of the funding*
  - *Hosting a baking fundraiser will drive 17.5% of the funding*
  - *Corporate sponsors will drive 20% of the funding*

Commentary

‘A Wish Come True’ is my take on a social not-for-profit case. While NFP cases can be quite rare in case interviews, it is a good exercise to gain exposure to business models that have diversified revenue streams. This case introduces a variety of different charts and exhibits for the candidate to work through. As a beginner case, ‘A Wish Come True’ encourages candidates to get into the practice of continuously linking their analysis/recommendations to a key overarching objective (in this case the $100K fundraiser target).

Common blind spots in this case are assuming the entirety of an NFP’s revenue must come from donations. Candidates are encouraged to broaden their thinking beyond traditional consumers and consider businesses as potential partners or sponsors. While the calculations themselves aren’t too tricky, common mistakes such as not clarifying the information represented in the exhibits or computing all the calculations before clarifying the approach with the interviewer can result in calculation errors.

Furthermore, there are numerous shortcuts to the calculations that can streamline the calculation process, so candidates are encouraged to consider their approach before jumping into the calculations.

Overall, while this case may be a bit unconventional for a beginner caser, it is in my opinion more fun than a typical profit case on a private business that sells some form of good or service. Also, shoutout to Hellen for your funny wish suggestion, I hope you achieve it one day.

Case #3

Big Night Out

Difficulty

Outcomes Tested:

- Market Sizing

Industry:

Hospitality

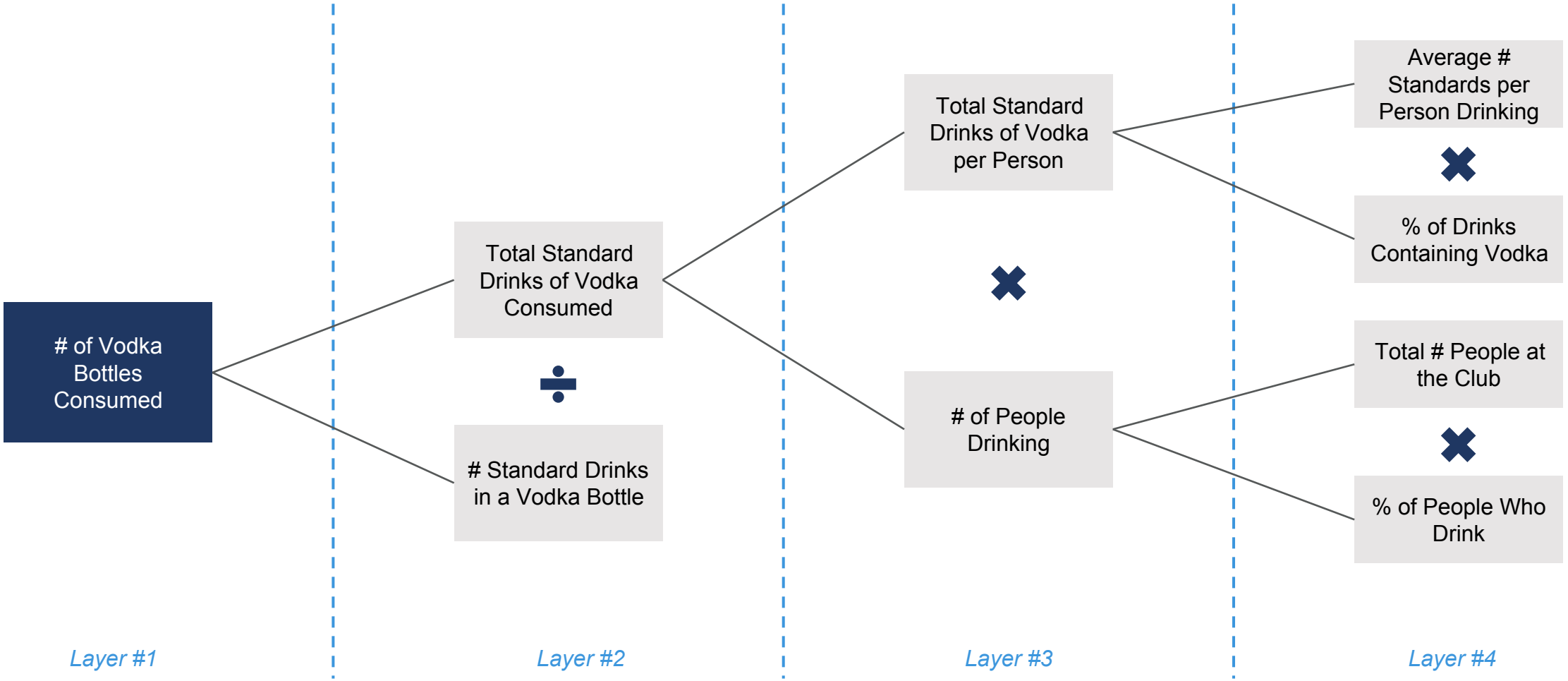
Brief

Please help me estimate the total amount of vodka that is consumed in a nightclub on a night out.

Clarifying Information

- *Use quantity metric of 1L bottles*
- *Consider a moderately large club that is popular*
- *Feel free to assume any age restriction whether that be 18+ or 21+*
- *Assume generic club, no specific target demographic or event day*
- *Assume a typical Friday/Saturday out*

Potential Answers: High Level Framework



Potential Answers – Walkthrough Numbers

- Layer 4 – Total Standard Drinks of Vodka per Person
  - Average # Standards per Person Drinking (4)
    - Averaged out, factoring in those who drank before / drink a lot on a night out
  - % Drinks Containing Vodka (50%)
    - More mixed drinks involving vodka, and a decent proportion of shots consumed would be vodka
- Layer 3 – Total Standard Drinks of Vodka per Person
  - Total Standard Drinks of Vodka per Person (2)
    - Average # Standards per Person Drinking (4) x % Drinks Containing Vodka (50%)
- Layer 4 - # of People Drinking
  - Total # of People at the Club (1,500)
    - Assume the capacity of the venue is around 500, with people cycling out every 2 hours with open hours from 10pm – 4am
  - % of People Who Drink (80%)
    - Considering a proportion of people who would drink prior to entering the club, as well as those who don't drink
- Layer 3 - # of People Drinking
  - # of People Drinking (1,200)
    - Total # of People at the Club (1,500) x % of People Who Drink (80%)

Potential Answers – Walkthrough Numbers

- Layer 2
  - Total Standard Drinks of Vodka Consumed (2,400)
    - Total Standard Drinks of Vodka per Person (2) x # of People Drinking (1,200)
  - # Standard Drinks in a Vodka Bottle (20)
    - 1L / 45ml (shot) approx. 22, rounding down to account for spillage
- Layer 1
  - # of Vodka Bottles Consumed (120)
    - Total Standard Drinks of Vodka Consumed (2,400) / # Standard Drinks in a Vodka Bottle (20)
- Therefore 120 1L bottles of Vodka are consumed on a night out at a single nightclub!

Commentary

‘Big Night Out’ is a fun demand/supply side market size that combines both bottom-up and top-down methodologies to generate a final estimate. On top of this, candidates get the opportunity to work with a variety of metrics.

The key to this market size is less so the numbers themselves, but rather the approach to the market size. Common blind spots that candidates may miss are recognising that consumers may and will drink alcohol that does not contain vodka, not every nightclub patron will drink alcohol in the club and that the number of guests at a nightclub is linked to the capacity and average ‘cycle’ time of a club.

Strong candidates will balance depth (around 3-5 layers deep) with being succinct and concise. Candidates are encouraged to justify assumptions with a combination of personal anecdotes and a wide range of considerations.

Overall, ‘Big Night Out’ is in my opinion a fun market size that is quite testing given its simplicity. Also, fun detail on the title page of this case, referencing our team’s recommendation for Pernod Richard in the 2021 Oliver Wyman Case Competition. I hope you too feel like drinking an Absolut Z!

Case #4

Black and White

Difficulty

Outcomes Tested:

- Decision making
- Mathematics

Industry:

Tourism

Case #4 – Black and White

Brief

Your client is the Chief Operating Officer (COO) of Taronga Zoo, the national zoo of Australia. The COO is wondering whether or not they should buy a panda and has come to you (Insert Candidate Name) and Company for help in making a recommendation.

Clarifying Information

- *They currently do not have any pandas*
- *Don't have any information on whether other zoos nearby have pandas*
- *They have a large range of other animals*
- *They are buying the panda so they can have it up for display*

Exemplar Framework

- *Financial*
  - *Additional revenue sources*
    - *Additional patrons*
    - *Additional goods / services*
    - *Increased funding*
  - *Costs associated in doing so*
    - *Cost of panda and enclosure*
    - *Operating costs*
- *Non-Financial*
  - *Logistical concerns*
  - *Legal concerns*
  - *Reputation concerns*

Q1 - Additional Revenue Sources

The COO is interested in understanding the financial implications of buying a panda. What potential additional revenue sources will buying the panda produce?

Potential Answers

- *Increased ticket sales with people visiting the panda*
- *Exclusive panda exhibits*
- *Photo opportunities*
- *Merchandise opportunities*
- *Donations to panda enclosures*
- *Funding from panda conservations*

Q2 – Evaluating the Revenue Opportunity

The COO has provided us with some information regarding the revenue opportunity.

- *Additional Admissions*
  - *1,000 people visit the Zoo in a day. This is expected to increase by 10%*
  - *Admissions are $10 a ticket*
- *Merchandise*
  - *10% of visitors will buy a piece of panda merchandise for $10 each*
- *Funding*
  - *Conservations will pay $200 in support every day for every sqm of enclosure needed*
  - *The one panda needs 10sqm of space*

With this in mind, how much incremental revenue will the Panda generate per day?

Answers

- *Additional Admissions*
  - *1,000 x 10% = 100 additional visitors*
  - *At $10 admission, this will generate $1,000 incremental revenue*
- *Merchandise*
  - *1,000 + 100 = 1,100 total visitors*
  - *10% of which will buy merch = 110 merch buyers*
  - *At $10 each, this will generate $1,100 incremental revenue*
- *Funding*
  - *$200 x 10 = $2,000*
- *Total Revenue*
  - *$1,000 + $1,100 + $2,000 = $4,100 per day*

Q3 – Additional Costs

What are some costs associated with buying the panda?

Potential Answers

- *Panda itself*
- *Enclosure*
- *Ongoing Costs of maintenance / training*
- *Food*
- *Transport fees*
- *Logistical / legal*
- *Marketing, production of merch*
- *Wages*

Q4 – Evaluating the Costs

The COO has provided us some information regarding the costs.

- *Panda*
  - *$3,650,000 initial purchase*
- *Enclosure*
  - *$36,500 per sqm*
- *Food / Cleaning Costs*
  - *$250 per day*
- *Legal Licensing for housing Pandas (fixed)*
  - *$3,000 per day*

How much incremental profit will the Panda generate per day?

Provide following information when asked:

- *Panda lives for 20 years*
- *Enclosure lasts 2 years*

Answers

- *Panda*
  - *$3,650,000 / 365 = $10,000*
  - *$10,000 / 20 = $500 per day*
- *Enclosure*
  - *$36,500 / 365 = $100*
  - *$100 / 2 = $50 psm per day*
  - *$50 x 10 = $500 per day*
- *Food Costs*
  - *$250 per day*
- *Legal Costs*
  - *$3,000 per day*
- *Total Costs*
  - *$500 + $500 + $250 + $3,000 = $4,250*
- *The Panda is making a $150 loss every day!*

Q5A – Non-Financial

The COO is now interested in understanding the non-financial impacts of buying the panda. What are some non-financial considerations when buying the panda?

Potential Answers

- *Zoo reputation*
  - *Pandas are endangered*
  - *Zoos have bad reputation*
- *Panda itself*
  - *Its health and wellbeing*
- *Customers*
  - *Customer perceptions of pandas*
- *Conservation / Investors*
  - *Their interests are maintained*
- *Government*
  - *Political representation with China*

Q5B - Mitigation

How will you address the risk of loss of reputation?

Potential Answers

- *Tangible Change*
  - *Work with conservations to build the enclosures*
- *Intangible Change*
  - *Focus messaging around the conservation of animals*

Q6 – Extra Panda?

The COO is also considering whether they should get two pandas instead of one. Should they do it?

Potential Answers

- *Pros*
  - *Pandas can interact with each other, increasing their mental health*
  - *More interesting to customers*
  - *Chance to breed more pandas*
  - *Potential to generate economies of scale and increased revenue through funding*
- *Cons*
  - *More expensive – Need to expand the enclosure*
- *Prompt candidates to recalculate the financials*

Answers

- *Revenue*
  - *Additional Admissions - $1,000*
  - *Merchandise - $1,100*
  - *Funding - $200 x 20 = $4,000*
- *Total Revenue*
  - *$1,000 + $1,100 + $4,000 = $6,100*
- *Costs*
  - *Panda*
    - *$500 per day x 2 = $1,000 per day*
  - *Enclosure*
    - *$500 per day x 2 = $1,000 per day*
  - *Food*
    - *$250 per day x 2 = $500 per day*
  - *Legal Licensing*
    - *$3,000 fixed*
- *Total Costs*
  - *$1,000 + $1,000 + $500 + $3,000 = $5,500*

The Zoo is now profitable! Making $600 profit every day!

Synthesis

After your long project, you head down to Taronga Zoo to look at the panda show. Just as the show is about to start, the panda falls over, rolling down the hill. As the staff rush to pick the panda back up and bring it back up to the top of the hill, you notice that the COO is sitting right next to you also keen to watch the panda show. The COO asks you for a summary of the case. Before the panda gets back up the hill, what will you say?

Potential Answer

- *Buy two pandas*
  - *Will generate $600 in profit everyday*
  - *Will improve mental health of the panda*
  - *More interesting to customers*
- *To mitigate against brand risk, position messaging around panda conservation*

Commentary

‘Black and White’ is my take on a similar panda case found in an old casebook. My case focuses more on quantitative and financial analysis and includes a monetary benefit that can be quantified with the inclusion of the second panda.

This case tests a candidate’s ability to make decisions in a structured and well-reasoned manner. Strong candidates will balance both financial and non-financial considerations whenever making a decision, both at the start of the case, as well as at the end when there’s the possibility of purchasing a second panda. This framework is quite replicable across all decision-making questions and should be preferred over taking ‘bets’ on what the main consideration or answer is.

Strong candidates will recognise the economies of scale that can be accrued from reducing the per unit cost of licensing and the monetary benefit linked to the size of the enclosure. Furthermore, strong candidates will recognise the need to annualise costs and compute a daily cost associated with capital expenditures. As an interesting application of the product lifetime concept, the lifespan of a panda can be similarly used to annualise the capital expenditure.

A common blind spot less experienced casers may have, is considering the needs of the panda itself. It is important for candidates to take the perspective of different stakeholders when brainstorming a list of considerations. Candidates are also encouraged to regularly consider how information previously shared will impact the decisions being made later.

Overall, ‘Black and White’ is a cute case that helps beginners develop strong decision-making fundamentals.

Case #5

A Blocky Investment

Difficulty

Outcomes Tested:

- M&A
- Mathematics

Industry:

Gaming

Case #5 – A Blocky Investment

Brief

Your client is the Head of Investments at Google, who is looking into the acquisition of the popular sandbox game Minecraft. Minecraft was sold in 2014 to Microsoft for $2.5Bn USD and they remain the current owners of the game. Since then, the game has expanded into multiple formats such as on Xbox, Augmented Reality, and an education mode available in schools. The client has hired you (Insert Candidate Name) and Company to help provide a recommendation around whether Google should purchase the Minecraft franchise.

Clarifying Information

- *Minecraft is a multi and single-player sandbox video game that allows players to build, explore, and survive in a procedurally generated 3D world made of blocks.*
- *No additional information regarding the original purchase of Minecraft by Microsoft*
- *There is no context behind why Google is thinking of purchasing Minecraft (no overarching objective/strategy)*
- *No specific KPI or target ROI*
- *Other alternative investments should not be considered*
- *Synergies can be possible with any of the Alphabet companies (YouTube, Google, etc)*
- *Google isn't currently in the gaming industry*
- *Microsoft's ask price is $4Bn*

Exemplar Framework

- *Industry – Is gaming an industry Google wants to enter into?*
  - *Growth rates / market size of the gaming industry*
  - *Industry overview of competitors*
  - *Industry overview of customers*
- *Minecraft – Is Minecraft, as a standalone company, a good investment?*
  - *What is the profitability of this investment?*
  - *What will the ROI or payback period of this investment be?*
  - *What other qualitative benefits does Minecraft provide? (customer base, IP, etc)*
- *Synergies – What are some new opportunities that can result from the ownership of Minecraft?*
  - *What strategies can we implement to increase the attractiveness of this investment?*
  - *Does this synergise well with Alphabet's other companies (YouTube)?*
- *Implementation – Is this acquisition feasible to implement?*
  - *Labour – Will there be a need for rehiring?*
  - *Regulation – What regulations do we need to consider?*
  - *Risk of interlopers?*

Q1 – Industry Analysis

The client is interested in whether gaming is an attractive industry.

Provide candidate with Exhibit #1

What are some potential reasons to explain this trend?

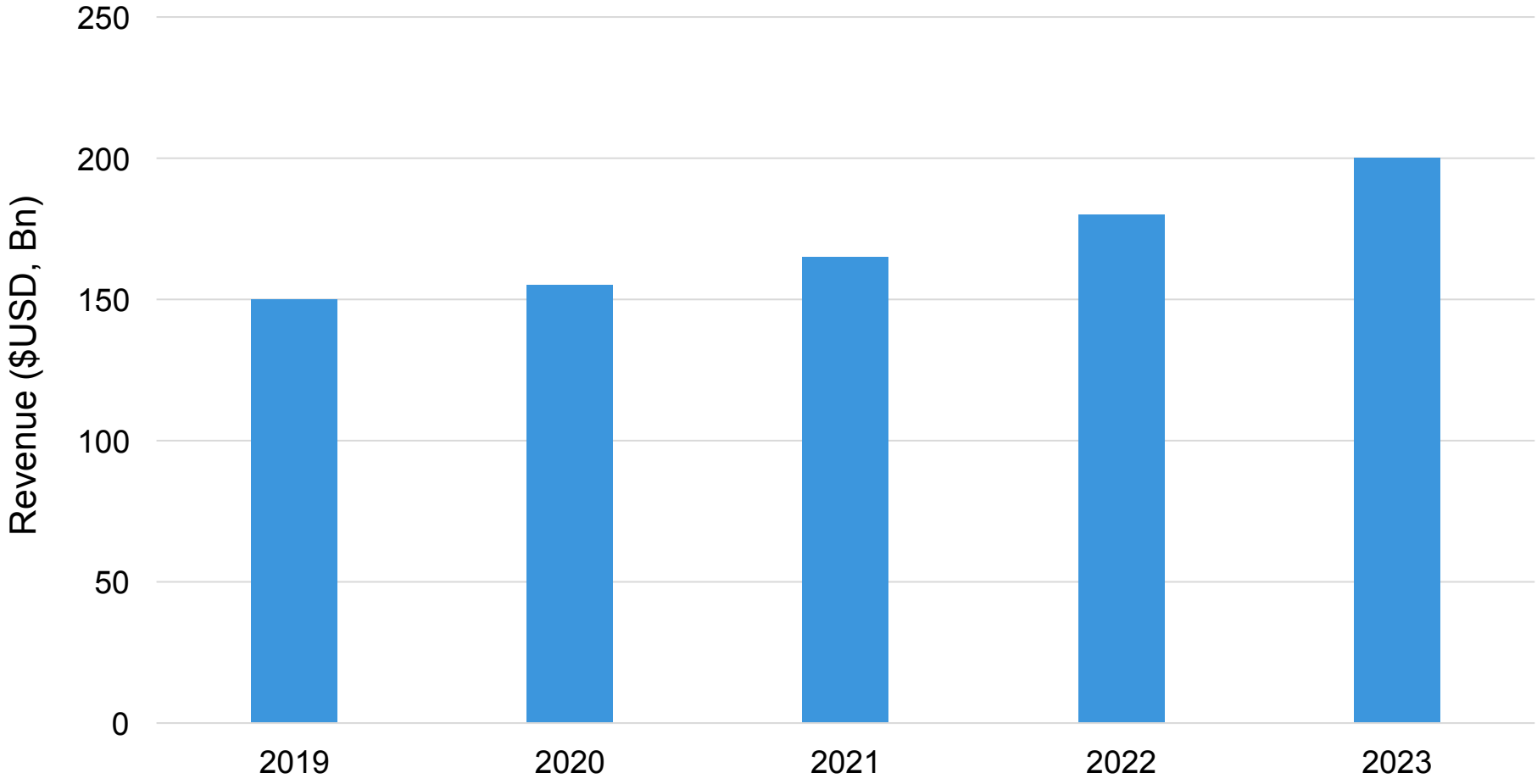
Potential Answers

Overall, the gaming industry has grown by 33% over the past 5 years, potentially due to the following drivers:

- *Demand Factors*
  - *COVID-19 – The lockdown has resulted in the expansion of hobbies that can be done from home*
  - *Growth in customer demand – Driven by new age groups (young and old) and geographies (developed and developing nations)*
  - *Growth in streaming – Streaming of games for entertainment has resulted in the growth of gamers*
  - *Growth in the popularity of eSports – Increasing opportunities in professional gaming*
- *Supply Factors*
  - *Growth of technology – Developments in the quality and format of games (Graphics, VR, etc)*
  - *Growth in the accessibility of games – Growth of mobile games and low-cost gaming systems*
  - *Game innovation – New updates, franchises, business models*
  - *Increased investment – Growth of new companies and games fueling industry investment*

Exhibit #1 – Gaming Industry Market Size

Figure #1 – Market Size of the Video Game Industry



Q2 – Minecraft as a Standalone Company

The client is interested in the attractiveness of Minecraft as a standalone company (Can prompt candidate to ask for what information will be needed to evaluate this). We have been provided with the following information:

- Minecraft sells 30 million copies a year
- Minecraft costs $25 as a one-time purchase
- Game sales make up 75% of total revenue
- Minecraft's net profit margin is 80%

If the asking price for Minecraft is $4Bn USD, what will the payback period be?

Answers

- *Game revenue: 30M x $25 = $750M in revenue*
- *Total revenue: $750M / 75% = $1000M = $1Bn in revenue*
- *Net Profit: $1000M x 80% = $800M*
- *Payback period: $4Bn / $800M = 5 years*
- *Commentary: 5 years is extremely long in the gaming industry, as users lose interest very quickly when new games are released, and it is unrealistic that they can continue selling 30M copies a year for the next 5 years*

Q3 – Opportunities and Strategies

The client wants you to brainstorm synergies or strategies that can be leveraged to reduce this payback period.

Potential Answers

- *Increase the number of sales*
  - *Include new regular updates*
  - *Run marketing campaigns (influencers, special events, competitions)*
  - *Sell to businesses (education, corporate)*
- *Increase the price per game*
  - *Increase the one-time purchase price*
  - *Switch to a yearly subscription*
  - *Sell add-ons – features (multiplayer, specific game modes), cosmetics (character or world designs)*
- *Increase revenue from other sources*
  - *Create new games (renditions using the Minecraft world, new formats)* (candidate needs to produce this idea)
  - *Enter new verticals (merchandise, TV shows, theme parks, events)*
- *Decrease costs*
  - *Leverage Google technology to cut down network/server costs*
  - *Leverage Google and YouTube ads to essentially "negate" marketing costs (will be double counted as a revenue inflow)*
- *Reduce initial investment*
  - *Negotiate a lower price*

Q4 – Minecraft 2

The client has the idea of launching Minecraft 2, which is a battle royale, 3rd person shooter game where players battle it out to be the last one standing in a world made from blocks. Minecraft 2 is expected to cost $1Bn to create and has projected sales of 30 million copies a year at a price point of $50 one-time payment each. This game will also have an 80% net profit margin.

What will the new payback period be on the acquisition of the Minecraft franchise?

Answer

- *Calculate yearly net profit from Minecraft 2*
  - *Yearly revenue: 30M x $50 = $1500M = $1.5Bn in yearly revenue*
  - *Net profit: $1.5Bn x 80% = $1.2Bn*
- *Calculate total yearly net profit from Minecraft franchise*
  - *$800M + $1200M = $2000M = $2Bn in yearly net profit*
- *Calculate new total investment*
  - *$4Bn + $1Bn = $5Bn in total investment*
- *Calculate new payback period*
  - *$5Bn / $2Bn = 2.5 years*
- *Commentary: 2.5 years is significantly more attractive for the gaming industry*

Synthesis

After completing your project, you gather your friends to queue up for a new match on Minecraft 2. Suddenly, the Head of Investments joins the Discord, asking you for a summary of the project. In the time it takes to find a game, provide a summary of the case.

Potential Answer

- *Proceed with the purchase of Minecraft, and leverage the franchise to launch Minecraft 2*
  - *Generate $2Bn in net profit every year*
  - *This will have a payback period on your investment of 2.5 years*
  - *Buying into an attractive industry with strong growth drivers*
- *Risks*
  - *Haven't considered the implementation time for the creation of Minecraft 2*
  - *Assumed strong sales figures into the future*
  - *Cannibalisation of Minecraft 1 sales*

Commentary

‘A Blocky Investment’ is my take on a typical M&A case. While slightly unconventional, the approach used to determine whether Minecraft is a good investment for Google remains similar to that of a typical M&A framework.

Common mistakes seen in candidates involve excluding ‘industry analysis’ from their decision-making framework, not evaluating the payback period relative to the industry, and being unstructured in their brainstorming. Industry analysis is important, as even if Minecraft as a standalone investment is not attractive, a recommendation can still be made for Google to enter the gaming industry by perhaps buying another game. Every time a payback period is calculated, it must be evaluated relative to the industry, and strong candidates will deduce that 5 years is a very long time, making it an unreasonable investment. Furthermore, in brainstorming ways to reduce the payback period, strong candidates will break down a numerical KPI (in this case payback period) into its different drivers, which will help produce a more exhaustive list of strategies. A common error may be lumping ‘game revenue’ with ‘revenue from other sources’ into the same bucket, which will make it harder for candidates to produce the strategy of launching a sequel.

While explored to a lesser extent in the case itself, synergies are an important consideration that candidates should be looking to reference back to. Comparing Microsoft to Google, Microsoft has stronger synergies with Minecraft given their ownership over the Xbox platform and existing expertise within the gaming space. As such, when evaluating this recommendation for Google, a significant further investment may be required to produce similar growth outcomes to that of Microsoft.

Overall, ‘A Blocky Investment’ is a fun intersection of M&A with the gaming industry. Also, a fun detail is that this case was inspired by Dream’s April Fools video of Google announcing their intentions to buy Minecraft, which definitely fooled me.

Case #6

CaseGPT

Difficulty

Outcomes Tested:

- Monetisation
- Mathematics
- Decision Making

Industry:

Technology

Case #6 – CaseGPT

Brief

Your client is the Head of Product at OpenAI, who is excited about their upcoming new launch of ChatGPT-X. ChatGPT-X boasts new features never seen before on a ChatGPT product, including live audio interaction, and live camera functionality. The client is looking into monetisation models for ChatGPT-X and has come to you (Insert Candidate Name) and Company asking for help in understanding what considerations should be made around this decision.

Clarifying Information

- *No prior evaluation or analysis of other monetisation models*
- *No key objective or overarching goal*
- *No information on competitor monetisation models*
- *ChatGPT is an advanced artificial intelligence language model capable of generating human-like responses to natural language prompts*

Exemplar Framework

- *Financial – Maximisation of Profitability*
  - *Maximisation of Revenue*
    - *Ability to charge a high price*
    - *High market size of potential use cases (buyers)*
  - *Minimisation of Costs*
    - *Low operational costs*
    - *Minimisation of marketing costs*
- *Non-Financial*
  - *Volume of responses*
    - *Whilst a cost driver, responses drive the increase in accuracy and effectiveness for an AI platform*
  - *Data security – Which model lends itself to the least exposure to data security of other regulatory risks*
  - *Brand reputation – Which model is most in line with their business brand values*
  - *User Experience – A model such as advertisements will take away from the user experience*
  - *Time horizon – Whether the client is looking for short-term term or long-term growth*
  - *Market share – Dominance over the market in the face of major competitors*
  - *Scalability/flexibility – Ability to pivot to market demands and replicable in new markets*
  - *Predictability of revenue streams – Consistent vs erratic*

Q1 – Different Monetisation Models

Your client is interested in understanding what types of monetisation models they should consider. Brainstorm a list of monetisation models ChatGPT-X can adopt.

Potential Answers

- *Freemium – Offer a free version and a premium version with more functionalities*
- *Licensing (businesses) – Sell to businesses for their use*
- *Subscription – Flat subscription for new users*
- *Advertising – Allow other businesses to advertise on their platform*
- *Pay-per-use model – Small fee every time a prompt is sent*
- *Data monetisation model – Selling of data to businesses*
- *Customisation partnerships with other businesses – Custom-tailored business solutions (chatbots)*
- *Consulting services – Advisory services to businesses looking to leverage AI*
- *API access – Providing developers access to its API for a fee*

Q2 – Profitability of Each Model

Your client is interested evaluating a freemium, subscription, and licensing model.

Provide candidate with Exhibit #1

Which model is most attractive from a financial sense?

Provide following information when asked (Candidate should realise that fixed costs are not important as it would be the same across each option):

- Hosting/operational fees costs ChatGPT-X $3 per user on their platform, but $5 for business users under the licensing model

Exhibit #1 – Expected Demand and Pricing Structures of Monetisation Models

Figure #1 - Expected Demand Across Different Monetisation Models

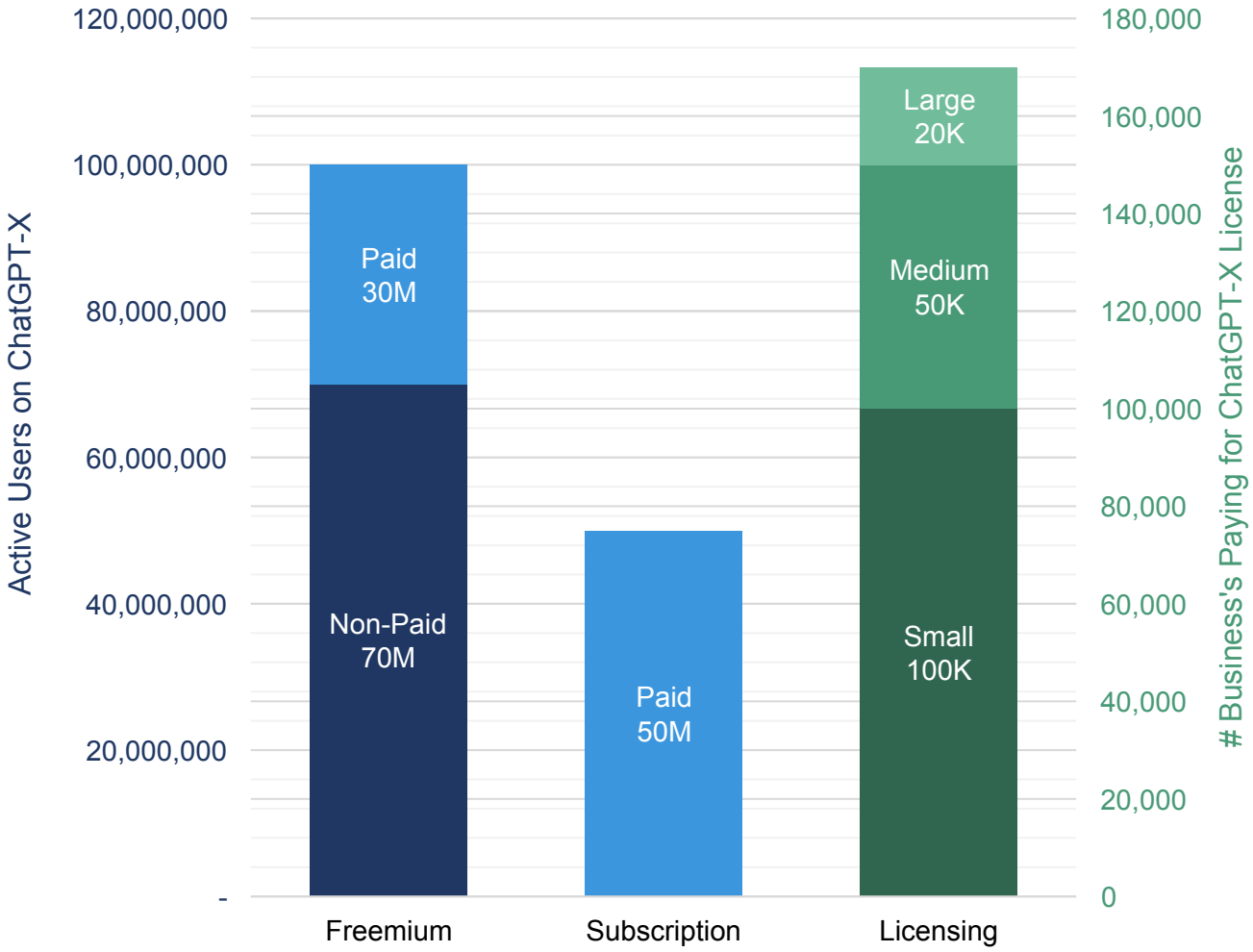


Figure #2 – Pricing Structure

Model Type	Price
Freemium	$20 per Paid User per Year
Subscription	$10 per User per Year

Licensing Model	Price
Small Business (10 Accounts)	$500 per Year
Medium Business (100 Accounts)	$2,500 per Year
Large Business (500 Accounts)	$7,500 per Year

Q2 – Answers

- Freemium model
  - Revenue: $600M (30M paying users x $20)
  - Costs: $300M (100M Users x $3)
  - Profit: $300M ($600M - $300M)
- Subscription Model
  - Revenue: $500M (50M paying users x $10)
  - Costs: $150M (50M users x $3)
  - Profit: $350M ($500M - $150M)
- Licensing
  - Revenue: $325M ($50M + $125M + $150M)
    - 100K small accounts x $500 = $50M
    - 50K medium accounts x $2,500 = $125M
    - 20K large accounts x $7,500 = $150M
  - Costs: $80M (16M x $5)
    - Number of users: 16M (1M + 5M + 10M)
      - Small users: 1M (100K x 10)
      - Medium users: 5M (50K x 100)
      - Large users: 10M (20K x 500)
  - Profit: $245M ($325M - $80M)
- Subscription model produces the highest profit!

Q3 – Qualitative Analysis

What are some drawbacks of a subscription model?

Potential Answers

- *Not as many active users (Guide candidates to produce this answer)*
  - *Particularly important for training an AI platform*
- *Pricing a flat fee buckets all users into the same pricing tier*
- *Potentially higher customer acquisition costs (compared to a freemium model)*

Q4 – Lack of Training Data

What are some ways to overcome the lack of training data for the new ChatGPT-X?

Potential Answers

- *Internal sources*
  - *Increase usage per user*
    - *Offer incentives for more usage*
  - *Grow user base*
    - *Create low-cost trial version of the subscription to encourage more users*
    - *Invest into marketing*
- *External sources*
  - *Crowdsource data (pay people to perform tasks to train the AI platform)*
  - *Buy training data from large organisations*
  - *Scape data from online sources*

Q5 – Buying Training Data

The client is interested in purchasing training data from external sources. If each organic user on average asks 50 prompts a year, and it costs 1 cent per prompt from an external source, should the client pay for external training data?

Answer

- *There is an unfulfilled need of 50M users (100M – 50M)*
- *If each user on average asks 50 prompts, that is 2.5Bn (50M x 50) prompts that need to be purchased to match the training set that comes with a freemium model*
- *For 1 cent per prompt, purchasing training data will cost OpenAI $25M (2.5Bn x $0.01), which still results in a profit $25M higher than that of a freemium model*
- *Therefore, the client should stick to the subscription model and pay for external data!*

Synthesis

After your long project, you decide to reward yourself with a nice meal at a fancy restaurant. You ask ChatGPT-X to give you 100 recommendations on potential restaurants to visit. You suddenly get a call from the Head of Product at OpenAI, who asks you for a summary of the case. In the time it takes for ChatGPT-X to return 100 suggestions, what will you tell them?

Potential Answer

- *Implement a subscription-based monetisation model and purchase external training data*
  - *This will generate $325M in gross profit every single year*
- *The client can also consider launching a licensing model at the same time if resources allow for it*
  - *This doesn't cannibalise existing sales as the fee per user is greater*
  - *The use case is different (personal vs business), meaning there will be little to no overlap*

Commentary

‘CaseGPT’ is my take on a monetisation case that incorporates technology. The structure was inspired by a similar case written for an online dating platform, but with the added twist of a strategy adaptation.

Common errors made in this case include not considering an exhaustive list of non-financial considerations when choosing a monetisation model (specifically for a ML platform), excluding B2B monetisation models, and the fact that multiple monetisation models can be launched simultaneously. Candidates are encouraged to think broadly beyond the traditional forms of monetisation and consider other ways the AI platform can be leveraged. As with most decision-making cases, taking a moment to consider if more than one option may be correct will lead candidates to realise that licensing could potentially be launched simultaneously and not cannibalise existing sales.

This case highlights the importance of training data in creating an effective AI platform. Fun fact: the reCAPTCHA’s you fill out when filling in information into online platforms are designed in a way that only humans can distinguish between the objects or text, but your very answers are being fed into a ML algorithm which is working towards developing the ability to interpret those very same images.

As a fun tribute to the platform that has helped me with the writing of these cases, ChatGPT had a large impact in producing this very case, and the title page image was generated by DALL-E!

Case #7

At a Crossroad

Difficulty

Outcomes Tested:

- Mathematics
- Decision making

Industry:

Infrastructure

Case #7 – At a Crossroad

Brief

Your client is the lead city planner for the Australian government. They are working on a new infrastructure project involving the intersection of two roads in a suburban neighbourhood in Sydney. To manage the traffic at this intersection, they are choosing between building two options; either traffic lights, or a roundabout, and have come to you (Insert Candidate Name) and Company for help in making a decision.

Clarifying Information

- *There is no overarching goal or objective*
- *No context behind the construction of this road / intersection*
- *No other options should be considered*
- *Traffic within this location would be moderate from every direction*
- *Both roads have 1 lane going in each direction, so each road is 2 lanes in width and will require a single-lane roundabout*
- *No information about prior decisions or infrastructure used in the vicinity of the intersection*

Exemplar Framework

- *Non-Financial (Since the client is representing the government, reasonable to present non-financial first)*
  - *Efficiency*
    - *Capacity of each option and overall impact on traffic*
  - *User experience*
    - *Safety / regularity of accidents*
    - *Ease of use – For drivers, bikers, pedestrians*
    - *Aesthetics*
  - *Environmental*
    - *Impact on emissions – level of driving / operation emissions*
    - *Space/landscaping required to build*
  - *Implementation*
    - *Road / landscape conditions*
    - *Timing of implementation relative to the goal*
- *Financial*
  - *Cost of implementation / operating*
    - *Maintenance*
  - *Cost benefits*
    - *Reduction of accidents*
  - *Any indirect revenue streams*
    - *Efficiency boost to the economy*

Q1 – Impact on Traffic

The client is interested in understanding the impact of both the roundabout and traffic lights on traffic. The client has run some analysis and has found the following:

Provide candidate with Exhibit #1

What can you conclude from this information?

Answers

	Total Trip Time	# of Trips per Min	# Cars Crossing per Min	# Cars Crossing in an Hour
Traffic Lights	30s (25s + 5s)	2 (60s / 30s)	8 (2 x 4)	480 (8 x 60)
Roundabout	30s (20s + 10s)	2 (60s / 30s)	10 (2 x 5)	600 (10 x 60)

- *Roundabout has a 25% higher capacity*
- *Drivers wait shorter at roundabouts – better customer experience > less road rage*
- *Drivers drive slower around roundabouts – Less severe accidents if any*

Exhibit #1 – Traffic Lights vs Roundabout

Figure #1 – Traffic Light Intersection

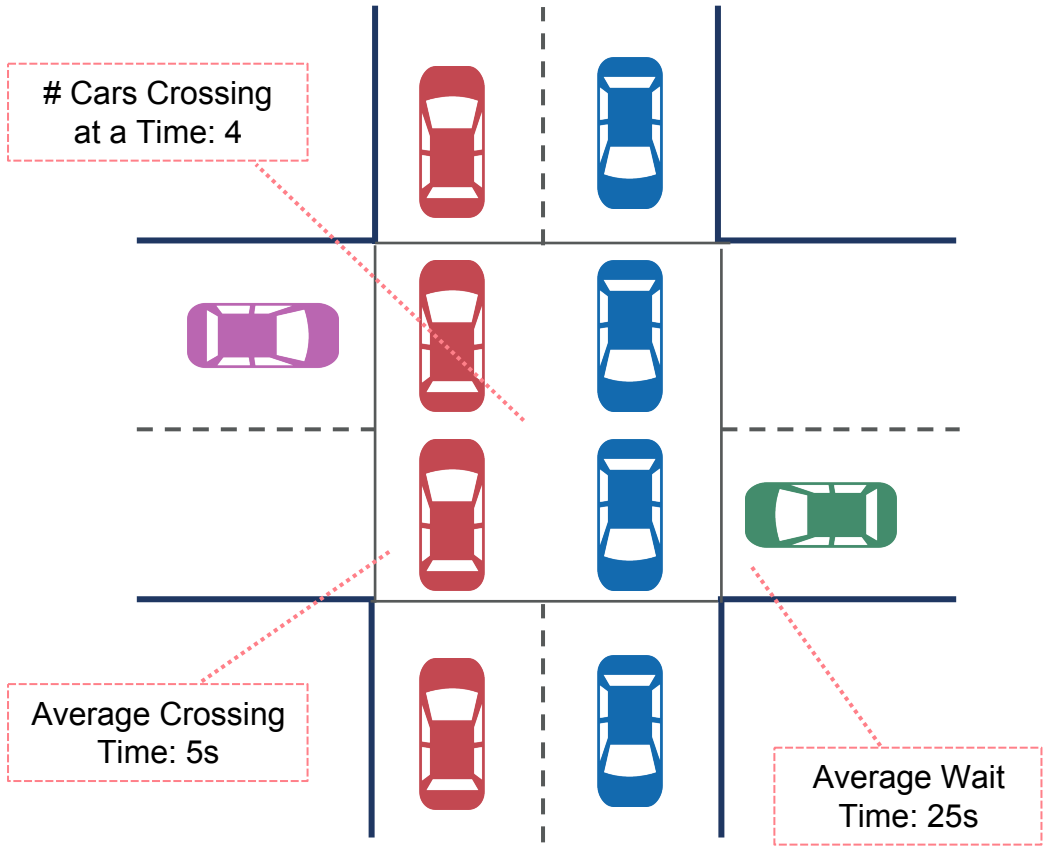
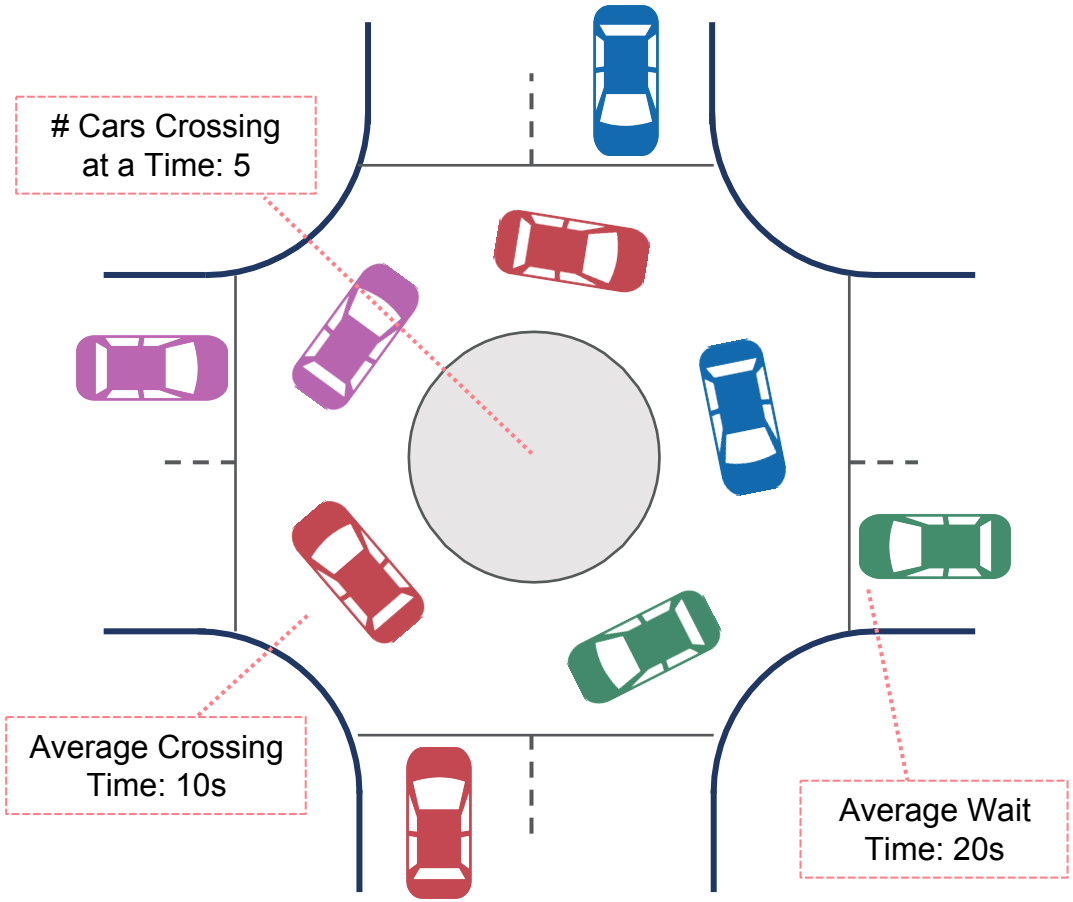


Figure #2 – Roundabout Intersection



Q2 – Profitability

The client is interested in understanding the financial evaluation of each option and has conducted some cost projections.

Provide candidate with Exhibit #2

What can you conclude from this information?

Answers

- *Traffic lights have yearly ongoing maintenance costs of $50K ($250K x 20%)*
- *Roundabouts have yearly ongoing maintenance costs of $5K ($1M x 0.05%)*
- *Accidents under a traffic light system cost $210K (20 x $10K + 5 x $2K) per year*
- *Accidents under a roundabout system cost $180K (10 x $10K + 40 x $2K) per year*
- *Traffic lights have a yearly cost of $260K ($50K + $210K)*
- *Roundabouts have a yearly cost of $185K ($5K + $180K)*
- *Therefore, roundabouts save the government $75K every year compared to traffic lights*
- *For a $750K increased investment ($1M - $250K), it will take 10 years before the roundabout becomes cheaper long term*
- *10 years is a reasonable payback period for infrastructure, so the government should proceed with roundabout*

Exhibit #2 – Cost Projections

Figure #2 – Projected Breakdown of Car Accidents

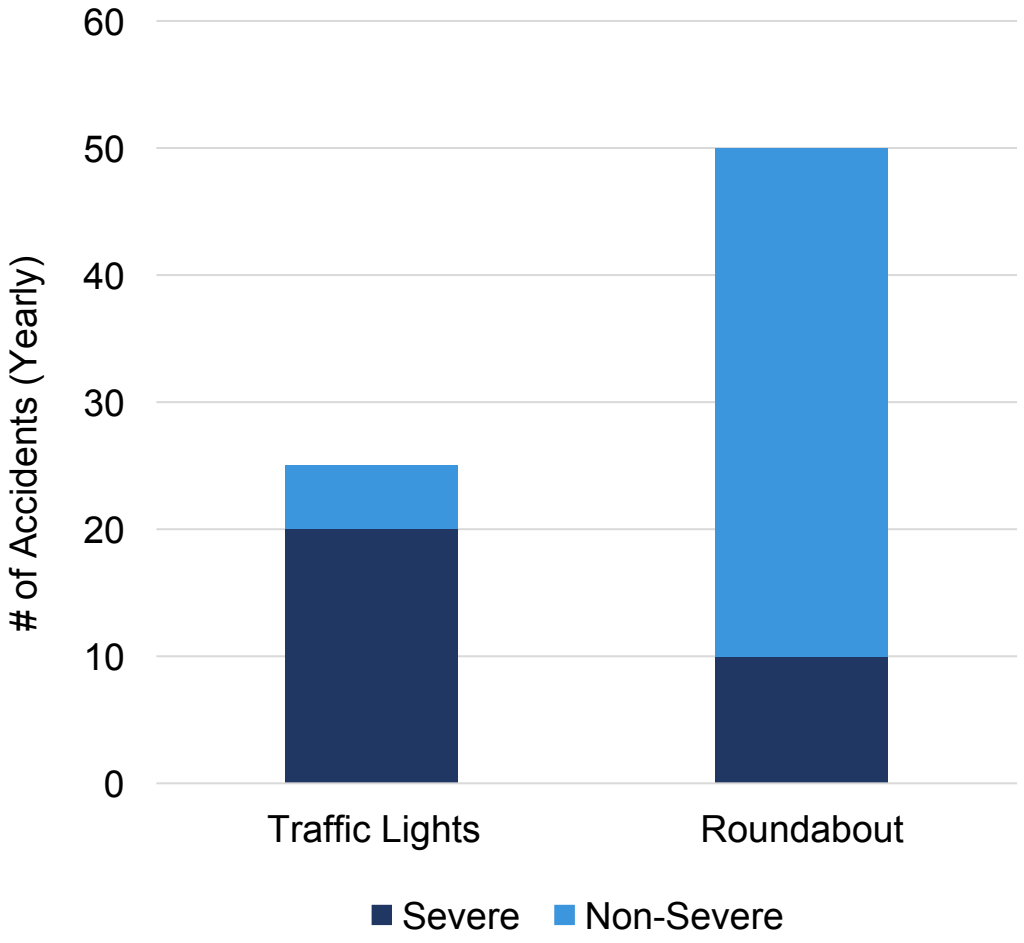


Figure #3 – Cost of Accidents

Accident Type	Cost
Severe	$10K
Non-Severe	$2K

Figure #4 – Cost Breakdown

	Initial Investment	Yearly Maintenance Cost (% of Initial Investment)
Traffic Lights	$250K	20%
Roundabout	$1M	0.5%

Synthesis

After your project, you leave the office and take a free Uber (fruber) back home. There is a lot of traffic today and you get stopped at an intersection. Suddenly you get a call from the lead city planner who is asking for an update on the recommendation. In the time it takes for you to cross the intersection, what will you tell them?

Potential Answer

- *Proceed with the roundabout*
  - *This will have a 25% increased capacity improving traffic conditions*
  - *Will be cheaper than the alternative of traffic lights after 10 years*
  - *Will have a reduced severity of road accidents*

Commentary

‘At a Crossroad’ is probably one of my favourite cases in this book. It highlights a decision that has been made multiple times, and one that impacts the majority of us, and dives deep into considerations that most people may not have thought about before.

While this is a rather simple case, there are a few blind spots that a majority of candidates fail to see. The biggest one is deriving non-financial insights from Exhibit #1, recognising the impact of slower crossing speeds on the severity of accidents, and the impact longer wait time has on road rage. Candidates are encouraged to ask themselves “why” and “so what” when making comparisons between key information.

Strong candidates will also communicate their approach and direct the analysis when working through cost analysis, establishing the need to find a fair point of comparison (rather than looking at yearly costs). Strong candidates will also lead the initiative when evaluating the payback of a 10-year offsetting period within the context of infrastructure. Furthermore, strong candidates will recognise the potential for indirect revenue streams such as a boost to the economy, which should still be reflected in the financial bucket of their framework.

Overall, ‘At a Crossroad’ is a pure reflection of my intentions with this casebook, to show how a consultant looks at the world around them, and how much more interesting life can be with a bit of curiosity.

Case #8

Moo-ving Forward

Difficulty

Outcomes Tested:

- Issue Diagnosis
- Mathematics

Industry:

Agriculture

Case #8 – Moo-ving Forward

Brief

Your client is the Chief Sustainability Officer at the Australian Department of Agriculture, Water, and Environment, or DAWE for short. In light of recently revised sustainability targets by the Australian government, the client is in charge of reducing greenhouse emissions from the Australian agricultural sector. They have come to you (Insert Candidate Name) and Company asking for help in identifying their biggest opportunity, and what initiatives they should consider investing in to drive an overall reduction in yearly agriculture greenhouse emissions by 5% over the next 3 years.

Clarifying Information

- *No specific information around the revised sustainability targets by the Australian government, within the scopes of this case, purely focus on the 5% reduction goal*
- *Current greenhouse gases equate to around 80 million metric tonnes of carbon dioxide equivalent*

Exemplar Framework

- *Analysis*
  - *Identify largest greenhouse emission drivers currently*
    - *Enteric fermentation*
    - *Manure management*
    - *Rice cultivation*
    - *Synthetic fertilizer use*
    - *Land use*
    - *Soil management*
    - *Burning of agricultural residues*
  - *Evaluate room for improvement in each driver*
  - *Consider growth rates for each driver*
- *Strategy*
  - *Reduce impact or volume of emissions driver*
    - *Improve supply/demand by introducing subsidies / investment into new technology*
    - *Improve supply/demand through market-based policies*
    - *Improve supply/demand through regulation*
  - *Introduce offsetting agent or emissions driver*

Q1 – Agriculture Emissions Deep Dive

The client has done some research into the current greenhouse gas emissions and has been able to provide a breakdown of the major drivers.

Provide candidate with Exhibit #1

What are some key insights that can be concluded?

Clarifying Information

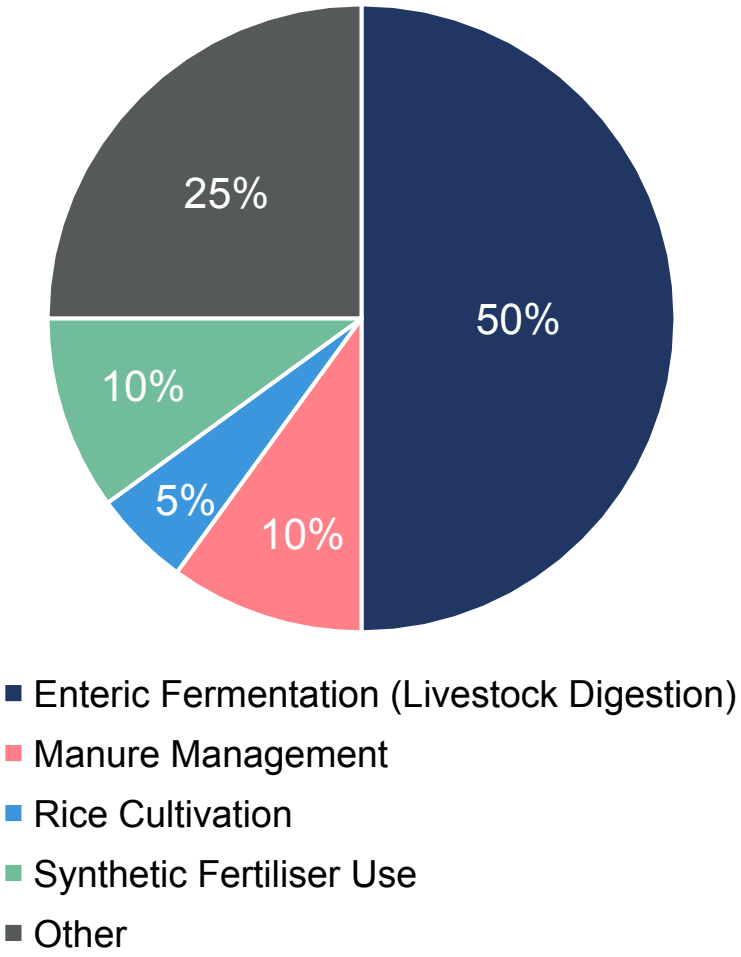
- Enteric fermentation refers to the methane that is produced by livestock as a byproduct of their digestion process. This is often emitted through burping and farting.
- Manure Management involved the handling, storage, and spreading of livestock manure that can result in the release of methane and nitrous oxide
- Rice cultivation refers to the production of rice in flooded paddy fields
- Synthetic fertiliser use includes the application of synthetic fertilisers in agricultural practices
- Other – Inclusive of burning agricultural residues, land use changes, and soil management

Potential Answers

- *Livestock, which is both a driver of enteric fermentation and manure management drives up to 60% (48M Mt of CO2 equivalent) of the total emissions, so this area should be explored further*

Exhibit #1 – Breakdown of Greenhouse Emissions in Australian Agriculture

Figure #1 - Total greenhouse gases broken down by driver



Q2 – Livestock Emissions Deep Dive

The client is interested in exploring the impact of livestock on overall greenhouse emissions. They have done some analysis of the different livestock, and how they contribute to enteric fermentation and manure management.

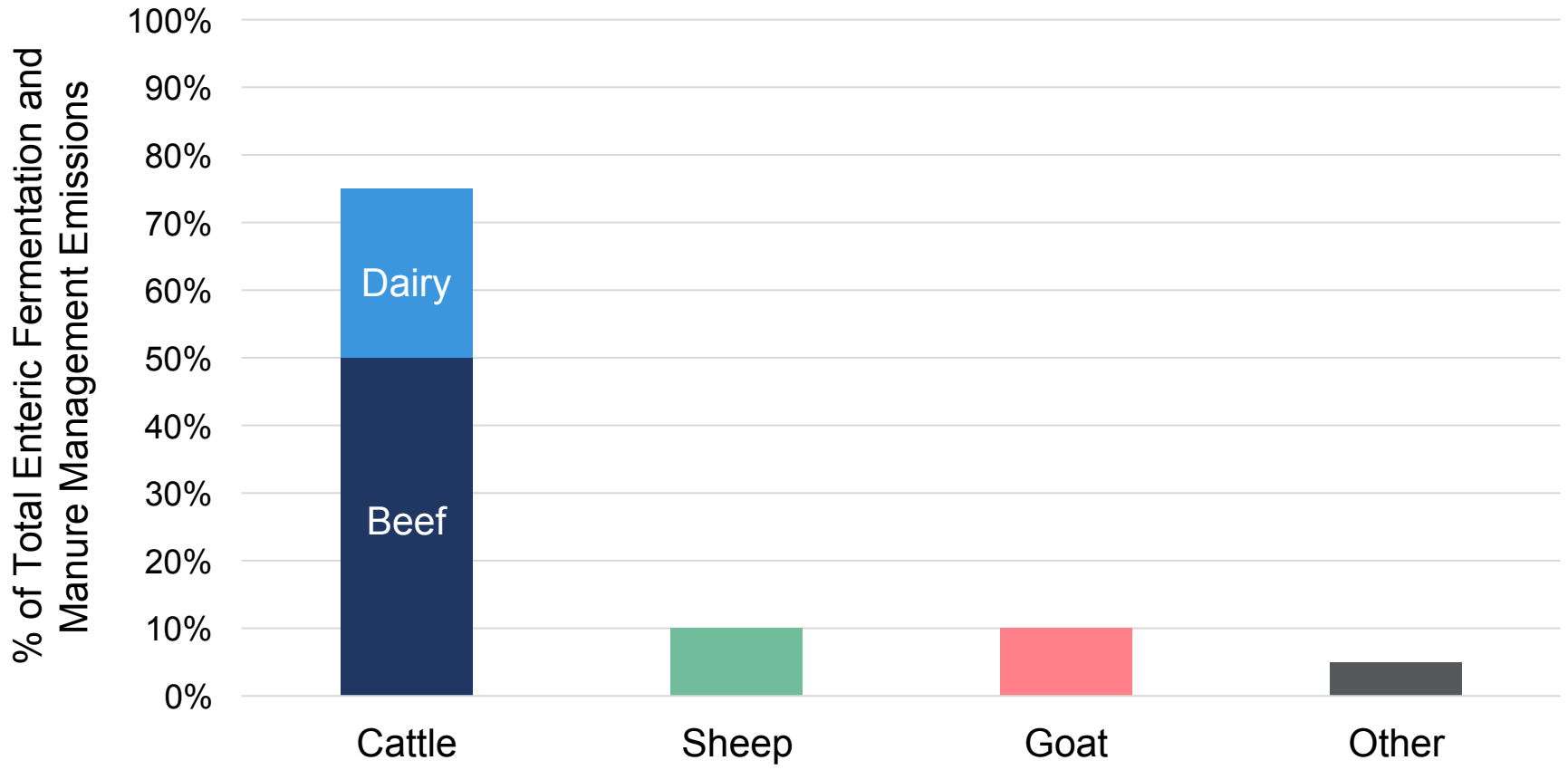
Provide candidate with Exhibit #2

What are some key insights that can be concluded?

Potential Answers

- *Beef cattle are the highest contributor to overall livestock emissions, comprising 50% of total enteric fermentation and manure management emissions (equating to 24 million metric tonnes of CO2 equivalent)*
- *If the client were able to cut this amount by a sixth, they will reach the goal of a 5% reduction in overall emissions (4M Mt of CO2 equivalent)*

Figure #2 – Breakdown of total enteric fermentation and manure management emissions



Q3 – Reducing Beef Cattle

The client is interested in reducing the emissions from beef cattle. Brainstorm some strategies to do so.

Potential Answers

- *Reduce # of beef cows*
  - *Demand*
    - *Promote beef alternatives such as lab-grown or plant-based beef* (candidate needs to produce this idea)
    - *Reduce demand for beef through marketing propaganda*
  - *Supply*
    - *Introduce regulatory restrictions that reduce or restrict # of cows*
- *Reduce emissions per cow*
  - *Reduce emissions over the lifetime of a cow*
    - *Investigate feed/additives that result in lower digestive emissions*
    - *Breed low-emission cattle or utilise crossbreeding strategies*
    - *Adopt more efficient manure management options*
  - *Reduce the lifetime of a cow*
    - *Investigate super feed/additives that allow beef cattle to grow to the desired condition faster*

Q4A – Beef Alternatives

The client is interested in exploring the potential of investing in beef alternatives such as lab-grown or plant-based meat. If a singular beef cow can produce 300kg of beef and currently Australia grows approximately 24 million beef cattle, how many tonnes of lab-grown / plant-based meat need to be substituted in order to hit the target of 5%

Answers

- *Beef cows contribute 30% of total greenhouse emissions (60% x 50%), which is equivalent to 24 million Mt of CO2*
- *For the Australian government to reach the goal of 4 million Mt of CO2 equivalent (80M Mt x 5%), a sixth of the beef cattle population needs to be substituted (4M Mt / 24M Mt)*
- *This equates to 4 million cattle (24m x 1/6)*
- *Therefore 1.2 million tonnes (4M x 300kg / 1000) of lab-grown or plant-based meat need to be substituted in order to hit the goal*

Q4B – Beef Alternatives

The client is quite sceptical of this strategy as the current production of lab-grown and plant-based meat in Australia is only 300 thousand tonnes a year. What barriers need to be overcome to achieve the target of 1.2M tonnes produced per year?

Potential Answers

- *Supply barriers*
  - *Currently expensive to produce lab-grown or plant-based meat at the same scale*
  - *Production facilities are yet to expand to the capacity that is required*
- *Demand barriers*
  - *Differences in taste profiles prevent meat consumers from making the switch*
  - *Cost of purchasing can be higher than that of meat, which makes them less desirable*
  - *Stigma and perception around lab-grown or plant-based meat as a result of lack of education makes consumers unwilling to try or integrate it into their own diet*
- *Overall, the industry is yet to hit critical mass, and while it may be reached over the period of three years, it is quite unpredictable*

Q5 – Super Feed

So back to the drawing board, the client has heard of a super feed which is a supplement that when fed to beef cattle, allows them to grow to the desired condition 25% faster. However, due to the extra nutrients being consumed, the cows undergo their enteric fermentation and manure process 10% times more. If this super feed was supplied to all the beef cattle in Australia, will the Australian government hit their target?

Answers

- *% Approach*
  - *Combining the impact of the two drivers will result in an overall reduction in emissions from beef cattle by 18.5% (75% x 110%)*
  - *Since this reduction is higher than the 16.67% cattle emission reduction target, this strategy will exceed the overall goal of a 10% reduction in greenhouse gases*
- *Calculation Approach*
  - *Currently, beef cattle contribute 24M Mts of CO2 equivalent*
  - *If the cow's lifespan were to reduce by 25%, it will result in a total of 18M Mts of CO2 equivalent reduced*
  - *However, if cows were to produce 10% increased emissions, the total will become 19.8M Mts of CO2 equivalent reduced*
  - *This will mean 4.2M Mts of CO2 equivalent will be reduced, exceeding the target of 4M Mts!*

Synthesis

After completing your project, you drive down to the local farm to see the beef cows in person. Suddenly a herd of cows walk out onto the road, and you brake suddenly. As the cows are crossing, you get a phone call from the client, who is asking for a summary of your recommendation. In the time it takes for the herd of cows to cross the road, what will you tell the client?

Potential Answer

- *Biggest opportunity to reduce agricultural greenhouse emissions lies in the beef cattle livestock which contributes to 30% of overall emissions*
- *You believe that this can be best reduced by introducing a super feed that expedites the growing process for the cattle*
    - *This will drive a 4.2M Mt reduction in CO2 equivalent*
    - *Potentially more achievable within a 3-year time frame*
    - *Satisfies all stakeholders*

Commentary

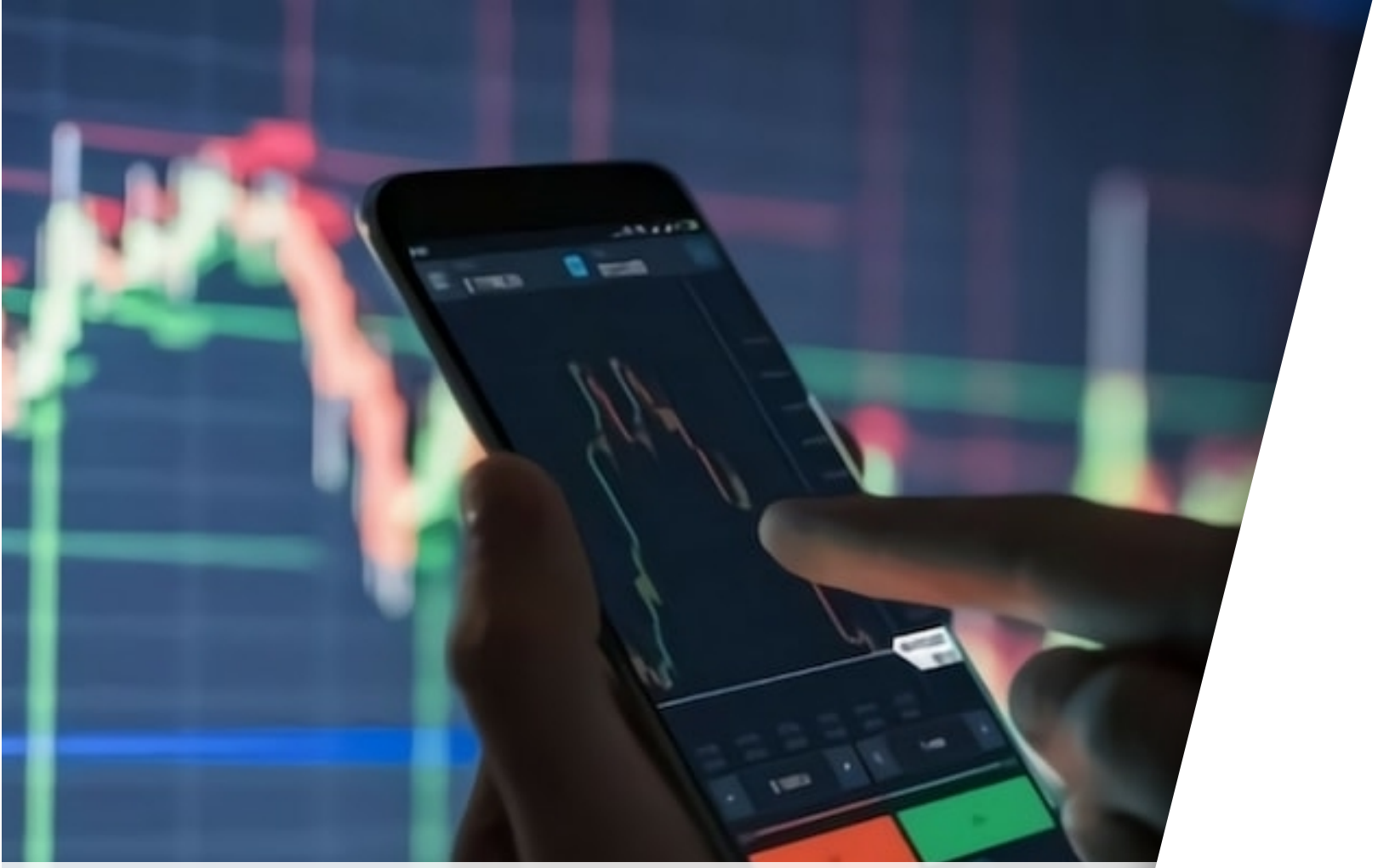
‘Moo-ving Forward’ is my take on a beginner-friendly issue diagnosis case. It highlights some interesting ideas explored by Australian start-ups in the agritech and biotech space.

Strong candidates will lead the interviewer through the exhibits, recognizing that livestock is a driver of both enteric fermentation as well as manure management. They will ensure to exhaust all analysis necessary to answer the first part of the case before moving on to strategies.

Common mistakes include not brainstorming in a structured and big-picture manner, which will make it difficult to produce an exhaustive list. Combinations of different frameworks such as supply and demand and driver trees may be useful to produce a strong response. Furthermore, inexperienced casers may feel the need to defend a strategy to the ends of the Earth, when providing a realistic judgement on the feasibility of a strategy is more appropriate.

Strong candidates will recognise the possibility of making calculations throughout the analysis of the exhibits to continuously contextualise the goal of 5%, leading to a conclusion that beef cattle production needs to be reduced by a sixth. Providing further judgement here would lead candidates to prioritise strategies that don’t reduce the number of beef cattle, as beef is one of the leading exports of Australia, and there will be significant backlash by farmers and the agricultural sector if red tape was added.

As a fun point of further reading, several startups in Australia produce lab-grown meat, as well as super feeds that help expedite the growing process for beef cows which ultimately acted as the inspiration for this case.



Case #9

Financial Farewell

Difficulty

Outcomes Tested:

- Exit Strategy
- Financial Mathematics

Industry:

Financial Services

Brief

Your client is the owner of a boutique managed fund specialising in defensive investments. Recently, they have heard of a new AI-powered technology that can pick and manage investments without the need of any manual assistance or guidance. It is nearing the end of the owner's career, and this sounds like a potential exit opportunity as they move into retirement. They have come to you (Insert Candidate Name) Consulting Group looking to understand and evaluate the different strategic alternatives available to them.

Clarifying Information

- *Managed fund*
  - *$100M assets under management (AUM)*
  - *Defensive investments include an array of government bonds, blue chips, infrastructure and real estate*
  - *Consistent average yearly return of 5%, with all returns reinvested into the fund*
  - *Owner has a 10% ownership stake in the AUM*
  - *A managed fund is where a professional investor pools money from multiple investors to invest in a diversified pool of assets*
  - *Main revenue streams are management and performance fees*
- *No specific objective, but focus on maximising financial gain*
- *Ignore any personal considerations or attachment to the business*

Exemplar Framework

- *Evaluate strategic alternatives* (candidate needs to produce all of these)
  - *Sell the business to a third party under continued management*
    - *Evaluate current profitability and estimate value of the business if sold*
    - *Evaluate logistics around stakeholder engagement, transfer of ownership/IP, legal structures*
  - *Liquidate business*
    - *Evaluate sale of AUM – Taking into account liquidity, stakeholder engagement, market conditions*
    - *Consider any ownership stakes that allow the owner to reap rewards*
  - *Continue operating business as it is*
    - *Evaluation will be similar if not the same as selling the business to a third party*
  - *Continue operating business but with new technology*
    - *Evaluation of technology – Accuracy, patents, alternatives, implementation requirements*
    - *Financial impact – how profitability or cashflows are expected to change*
    - *Non-financial impact – Integration with existing systems, stakeholder engagement, quality of service*
- *Make selection on the alternative that provides the strongest financial outcome*

Q1 – Selling Business to Third Party

The client wants to evaluate the first option of selling to a third party under continued management. What information will you need to estimate how much the business can be sold for?

Provide following information when asked:

- AUM: $100M
- Yearly management fees: 1% of AUM
- Performance fees: Averages 1% of AUM
- Operational and fixed costs account for 50% of revenue, half of which are labour costs
- AUM yearly return: 5% which is reinvested back into the fund
- Discount rate: 10%

Answers

- *Revenue in year 1: $2M*
  - *1% x $100M + 1% x $100M*
- *Profit in year 1: $1M*
  - *$2M - $2M x 50%*
- *Value of business as perpetuity (defensive asset fund so evaluate as a perpetuity): $20M*
  - *$1M / (10% - 5%)*

Q2 – Liquidation

The client wants to evaluate the second option of complete liquidation. How much does the client stand to gain in the case of a liquidation?

Answers

- *Assuming full liquidation of the AUM, there will be a total of $100M to be redistributed to the investors*
- *Since the client has a 10% stake in the AUM, they will stand to gain $10M from the liquidation*
- *As of right now, selling the business to a third party is the most attractive option*

Q3 – Continue Operating as Usual

The client wants to evaluate the third option of continuing to operate as usual. How does this option compare to the first two?

Answers

- *From a financial valuation perspective, it would be worth similar to if the business was sold to a third party which is $20M*
- *However, given that the owner is near the end of their career, it is unrealistic to value the business using a perpetuity, which makes this option less attractive than selling to a third party*

Q4 – Continue Operating with the New Technology

The client wants to evaluate the use of the new technology. What are some pros and cons of using such technology?

Potential Answers

- *Pros*
  - *Financial*
    - *May have the potential to increase fund performance by reducing emotional biases, and increasing accuracy and efficiency*
    - *Cost-cutting benefits from reduced need for labour*
  - *Non-financial*
    - *Increased scalability for expansion of AUM or business operations*
- *Cons*
  - *Financial*
    - *Cost of initial investment, ongoing operation, and redundancy payouts*
  - *Non-financial*
    - *May reflect poorly on the brand image due to a lack of trust in AI systems*
    - *More prone to regulatory scrutiny and compliance challenges*
    - *Technical risks and new knowledge gap required to overcome*

Q4 – Continue Operating with the New Technology

The client has done some financial analysis on the new technology.

- The AI technology requires an initial investment of $20M
- The AI technology will reduce labour costs by 40%
- The AI technology will increase yearly return to 6%
- As a result, the revenue from the performance fee will increase by 50%

Should the client adopt the technology?

Answers

- *Recalculated yearly profit: $1.5M*
  - *Revenue in year 1: $2.5M ($1M + $1M X 150%)*
  - *New cost margin: 40% (50% x 50% + 50% x 50% x (1 - 40%))*
- *Recalculated NPV of FCF: $37.5M*
  - *$1.5M / (10% - 6%)*
- *NPV factoring initial investment: $17.5M*
  - *$37.5M - $20M*
- *Therefore selling to a third party will still be the most financially attractive option!*

Synthesis

After completing your project in the early hours of the morning, you head out of the office for a free Uber (fruber) back home. As you are waiting for the Uber to turn the corner, you hear someone shout your name. "(Insert Candidate Name)!" It's the owner of the managed fund! They tell you they are running late to an end-of-day work debrief and need to update the rest of the team on the project. In the time it takes for the Uber to arrive, what will you tell them?

Potential Answer

- *Selling to the business to a third party will be the best option*
  - *Will drive the highest financial return of $20M*
  - *Offers relatively lower risk compared to continuing the business*
  - *Allows the owner to retire without stress*

Commentary

‘Financial Farewell’ is my take on an exit strategy case, heavily inspired by one of my favourite cases found in the MIT Sloan Casebook. This case was written for finance background interviewees and features commonly used financial mathematics and concepts.

Common mistakes made by interviewees include getting distracted from the key case question which asks for strategic alternatives in the context of potential exits and instead focusing too heavily on the new technology on the market. Once a strong framework has been produced, further analysis and working through the subsequent problems aren’t too difficult. It is, however, important for the candidate to develop a strong understanding of the operations of a managed fund which will then direct their approach to understanding the financial return of each option.

Strong candidates will recognise how previous assumptions made will impact decision-making further down the case. This is particularly evident when comparing the option of selling the business to a third party and continuing to operate as normal. The assumption that the business will produce FCF in perpetuity is unrealistic in the context of continued operation as the client is looking to retire. Another possibility candidates may recognise, is adopting the new technology and THEN selling to a third party, which will be more attractive than adopting the technology and operating it.

Overall, ‘Financial Farewell’ is a nice intersection between exit strategy and financial services, which is a combination not commonly explored but full of interesting nuances.

Case #10

A Highly Rated Match

Difficulty

Outcomes Tested:

- Product Design
- Game Mechanics
- Mathematics

Industry:

Online Dating

Case #10 – A Highly Rated Match

Brief

Your client is the Head of Product at Hinder, a large online dating platform that uses the popular swipe method of matching potential partners; swiping right to accept someone and left to reject them (think Tinder). As most popular dating apps these days, they also offer free users one 'Super Like' a day, which notifies the other user of your interest in their profile. Hinder is looking to increase the number of successful relationships that come out of users on their platform and has come to you (Insert Candidate Name) Consulting Group asking for help in brainstorming some strategies to do so.

Clarifying Information

- *Hinder does not operate in any niche, or have any key distinguishing characteristics that set them apart from other major dating platforms*
- *Currently operates in a freemium model, where paid users get no ads and 5 'Super Likes' a day, but for the scope of this case, Hinder is concentrated on increasing the number of relationships coming out of both paid and non-paid users*
- *Focus more on success rate (# relationships relative to users) rather than the number of relationships*
- *A successful relationship is considered when a match on Hinder becomes official dating*
- *There is no specific KPI/goal Hinder is targeting*
- *There is no specific method of measurement for tracking successful relationships > so focus on quality and accuracy of matches*

Exemplar Framework

- *New users onboarded onto Hinder*
  - *Positioning Hinder as a long-term relationship platform vs short-term fling platform*
  - *Target specific niches of customers who are more interested in developing long-term relationships*
- *Match Making Algorithm*
  - *Match users based on preferences*
  - *Creation of an elo-system to match users who are more likely to match*
- *User behaviour when swiping*
  - *Create a limit on the number of accepts to increase the impact/meaningfulness of each accept*
  - *Switch to a 'Like Only' system, where users are notified every time someone accepts them*
  - *More creative profile prompts to encourage personality sharing*
- *Facilitation of a match*
  - *Date idea prompts*
  - *Bonding questions to break ice faster*
  - *Deals with activity providers to offer discounted tickets to matches*

Q1 – Elo System Mechanics

The client is interested in improving the match-making process by creating an Elo rating System to match users that have a higher likelihood of creating a long-term relationship. An Elo rating system matches users based on a points system. Points are gained when a user's profile is Accepted (swiped right) and points are lost when a user's profile is Rejected (swipe left). Profiles that have a similar number of points will be suggested to each other.

What are some considerations that need to be made around the implementation and mechanics of this elo system?

Potential Answers

- *How the impact of swiping should vary based on the relative difference in points between users*
- *Prevention of users gaming the system*
- *Minimisation of the impact of personal preferences in inaccurately representing users' elo (a form of racial / value / age preference / geography should take precedence before an Elo system is applied)*
- *How the points should be distributed and the establishment of upper and lower boundaries*
- *Base level of points for new users*
- *Messaging around the points system (will this be accessible to the user to view?)*

Q2 – Elo System Mechanics Maths

To explore this Elo system in practice, let's take the example of a new user named Celine.

Provide candidate with Exhibit #1

What is Celine's new elo after 5 swipes on her profile?

Answer

	User X Elo	Celine's Elo	Difference	Impact of Swipe
User 1	900	1000	100 (Lower)	-10 x 1 = -10
User 2	1200	1000 – 10 = 990	210 (Higher)	10 x 1.4 = 14
User 3	1000	990 + 14 = 1004	4 (Lower)	10 x 1 = 10
User 4	800	1004 + 10 = 1014	214 (Lower)	10 x 0.6 = 6
User 5	1600	1014 + 6 = 1020	580 (Higher)	-10 x 0.4 = -4
		1020 – 4 = 1016		

Celine's elo will be 1016!

Exhibit #1 – New User Activity Log and Rating Determination System

Celine's Starting Elo: 1000

Activity Log:

1. Alex (900) swipes left
2. Luke (1200) swipes right
3. Nathanial (1000) swipes right
4. Kristian (800) swipes right
5. Tobias (1600) swipes left

Celine's New Elo: ???

Figure #1 – Activity log of responses to Celine's profile

	Swipe Right	Swipe Left
Base Impact on Elo	+ 10	- 10

Figure #2 – Base impact of swiping on elo

Difference in Elo	Profile with a Lower Rating than Celine		Profile with a Higher Rating than Celine	
	Right Multiplier	Left Multiplier	Right Multiplier	Left Multiplier
≤ 100	1x	1x	1x	1x
101 - 200	0.8x	1.2x	1.2x	0.8x
201 - 500	0.6x	1.4x	1.4x	0.6x
501 - 750	0.4x	1.6x	1.6x	0.4x
750 +	0.2x	1.8x	1.8x	0.2x

Figure #3 – Multiplier effect based on elo differences

Q3 – Multiplier Evaluation

The client is interested in getting your thoughts on the use of the multiplier. What are the pros and cons of having a multiplier? And if you had to make any adjustments, what would they be?

Potential Answers

- *Pros*
  - *It allows for a faster determination of users' estimated "attractiveness"*
  - *Generally, more accurately reflects the dynamic of leagues within the dating scene*
- *Cons*
  - *It is not equitable to give users who are rated higher or lower elo the ability to make large changes on the elo of others (why do some users' opinions matter more than others?)*
- *Adjustments*
  - *Switch to a ratio system and rank based on the ratio of right to left swipes*
  - *Reduce the multiplier effect on left swipes*
  - *Only use the multiplier in the first few swipes to help determination (or an increased scaled multiplier, and reduced one after the grading period)*

Q4 – Elo System Opportunities

Now that we have a working Elo system in place, the client is interested in what other ways they can capitalise on this Elo system.

Potential Answers

- *Create a trending page of higher rated profiles*
- *Sending 'Super Likes' will increase the elo gained*
- *Periodically drop in profiles that are higher rated into users' feeds to boost short-term endorphins*
- *Periodically show profiles to lower rated users to drive sending of 'Super Likes', feeding short-term endorphins*
- *Sell the intellectual property*

Q5 – Elo System Risks

What are some key risks you see with such a system being implemented?

Potential Answers

- *Customer*
  - *Acknowledgement of a rating system can negatively affect mental health and self-esteem for users in lower leagues*
- *Company (External)*
  - *Negative publicity around creating an artificial league system*
- *Company (Internal)*
  - *Data security*
- *Society*
  - *Promotes lookism*
  - *Can contribute to the attention economy*

Synthesis

You pass off your recommendations to the developers who build the new function into the app. Celine is the first user to use the new function and begins swiping. The Head of Product enters the room and asks for a summary of the case. In the time it takes for Celine to find a suitable match, present your findings.

Potential Answer

- *Create a new Elo rating system for Hinder*
  - *This will help improve the accuracy of the match-making algorithm*
  - *This also allows Hinder to increase user activity on the app through short-term endorphin boosts*
  - *Be careful with the messaging and publicity around this new system*

Commentary

‘A Highly Rated Match’ is my take on exploring the perspective of a product manager. The Elo system was originally implemented by Tinder before they updated to a new algorithm. This case tries to explore aspects of the attention economy and the interesting ways in which dating platforms leverage this in ways not possible by other social media platforms.

This case requires candidates to brainstorm specific ideas to progress through the case rather than “tricking” them into making mistakes. As a result, candidates with a strong product mind and strong creative thinking generally perform better, often structuring their thoughts by customer journeys and considering a wide range of considerations and perspectives of stakeholders.

This case also explores strategy at a more micro level, leaning away from big-picture strategies, but rather more specific adjustments to working products to influence customer behaviour and outcomes.

As a fun detail, the Elo system has been most commonly used in Chess competitions, so candidates who play / have played Chess often find themselves working through the calculations significantly faster.

Case #11

A Bus-iness Problem

Difficulty

Outcomes Tested:

- Market Sizing

Industry:

Transport

Case #11 – A Bus-iness Problem

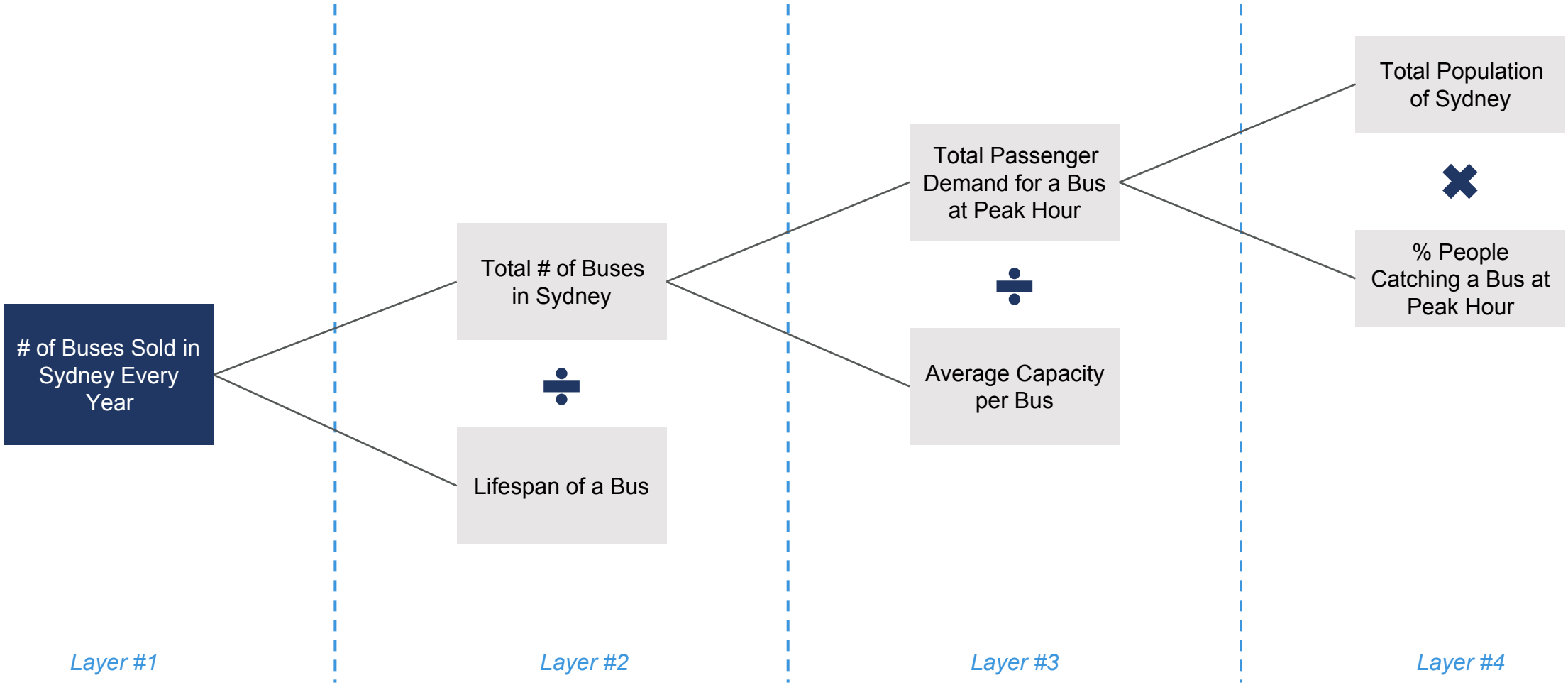
Brief

Please help me estimate the number of buses sold in Sydney, Australia every year.

Clarifying Information

- *Only consider buses used for public transport*
- *Assume population of Sydney to be 5M*

Potential Answers: High Level Framework



Potential Answers – Walkthrough Numbers

- Layer 4
  - Total Population of Sydney (5M)
  - % of People Catching a Bus at Peak Hour (10%)
    - Depending on how much time you have, this % can be further broken down into drivers such as:
      - Age / demographic
      - Forms of transport (trains / driving / walking)
- Layer 3
  - Total Passenger Demand for a Bus at Peak Hour (500K)
    - Population of Sydney (5M) x % People Catching a Bus at Peak Hour (10%)
  - Average Capacity of a Bus (50)
    - Considering both # seats + space for people to stand
- Layer 2
  - Total # of Buses in Sydney (10K)
    - Total Passenger Demand for a Bus at Peak Hour (500K) / Average Capacity of a Bus (50)
    - This number can be sense checked with a quick top-down market size: # households with cars x # cars per household x % on the road at a time
    - If there are 1M cars on the road at a time, it seems reasonable for one in every 100 vehicles to be a bus
  - Average Lifespan of a Bus (10 Years)
    - Assumption considering other forms of vehicles / level of usage

Potential Answers – Walkthrough Numbers

- Layer 1
  - # of Buses Sold in Sydney Every Year (1K)
    - Total # of Buses (10K) / Average Lifespan of a Bus (10 Years)
  - Therefore, there are 1,000 buses sold every year in Sydney

Commentary

‘A Bus-iness Problem’ is the shortened version of a market sizing question asked in a BCG interview. It is another market size that combines both demand and supply-side approaches with top-down and bottom-up methodologies.

The crux of this market size lies in the candidate’s ability to recognise that demand for buses only needs to be measured at a singular point in time when capacity is maxed out rather than over a period of a year. Adding a timescale to this market size increases its difficulty and produces less accurate results.

Strong candidates may also use quick and dirty top-down market sizing to sense-check their final numbers. This approach is extremely effective and can be done inside the candidate’s head.

This market size also encourages the use of a replacement rate, which is a method candidates are expected to be familiar with.

Follow-up questions can be asked around the impact of an X% increase in a specific driver or asking candidates to produce graphs of expected bus demand during the day.

Case #12

No Place to Call Home

Difficulty

Outcomes Tested:

- Market Sizing
- Mathematics

Industry:

Public Sector

Case #12 – No Place to Call Home

Brief

Your client is the Head of the Australian Government Department of Social Services (DSS), who is currently trying to tackle the issue of homelessness in Australia. Budget allocation this year has been tight respective to inflation, so the DSS must be selective with their strategy moving forward. That is why they have come to you (Insert Candidate Name) Consulting Group, asking the key question: how can the DSS help reduce homelessness by 10% over the next 5 years?

Clarifying Information

- *Homelessness is defined as living in non-conventional (such as living on the street), short-term or emergency accommodation (such as living temporarily with friends and relatives)*
- *Budget allocation this year has been $2Bn in total for homeless support*
- *Historically, the budget has been around $2Bn per year, with most of it being spent on income support*
- *No current census data on the homeless population, so may need help in market sizing it*
- *The scope is Australia wide*

Exemplar Framework

- *Analysis*
  - *Dive into drivers behind homelessness*
  - *Understand the market size of the homeless population (contextualise the goal of 10%)*
  - *Narrow the scope of homelessness*
  - *Evaluate past or current budget usage*
- *Strategies*
  - *Reduce the rate of the population becoming homeless (Preventative)*
    - *Better education outcomes*
    - *Affordable housing*
    - *Legal protection*
  - *Help the homeless population attain permanent residency (Fixative)*
    - *Temporary housing*
    - *Shelters*
    - *Collaborations*

Q1 – Market Size

The DSS would like your help in understanding how many homeless people need to be rehoused to hit the goal. How would you approach market sizing the number of homeless people in Australia?

Potential Answers

- *Top-down*
  - *Population segmented by age group / location / demographic / income*
  - *Rate of homelessness / poverty line*
- *Other*
  - *Budget use / level of support provided*

Provide following information when asked:

- *$2Bn historical budget*
- *80% of homeless people receive support from the DSS*
- *Average of $25,000 in support received per homeless person (registered on a yearly basis and distributed weekly)*

Answers

- $2Bn / $25,000 = 80,000 homeless people receiving support
- 80,000 / 80% = 100,000 total homeless people
- 100,000 x 10% = 10,000 homeless people to be transitioned to permanent housing over 5 years

Q2 – (If candidate has not brainstormed any/enough strategies) Brainstorming

The client wants you to help brainstorm some fixative strategies to help transition current homeless people into permanent residency.

Potential Answers

- Direct support
  - Build temporary housing communities
  - Build low cost housing
  - Education programs
  - Partnerships / collaborations
- Indirect support
  - Affordable housing
- Subsidies
  - Renting credits
  - Income support

Q3 – Temporary Housing

The client wants your help to evaluate building temporary housing apartment blocks as a strategy. So, given the following information:

- Each apartment has a total capacity of 60 people
- It takes on average 6 months per homeless person in temporary housing to transition to permanent housing
- These apartments will be constructed by buying out existing apartment blocks (so construction/setup time is nil)

How many homeless people can be transferred into permanent housing by building 10 temporary housing apartment blocks?

Answers

- 10 apartment blocks x 60 capacity = 600 homeless people capacity at a time
- 600 x 12/6 months = 1,200 homeless people transitioned into permanent housing per year
- 1,200 x 5 years = 6,000 total homeless people transitioned into permanent housing after 5 years (40% short of the goal)
- Candidates should suggest reducing the transition period. If they don't, prompt them to do so

Q4 – Temporary Housing Optimisation

Brainstorm some ways the client can reduce the transition period of 6 months.

Potential Answers

- Supportive
  - Offer additional services
  - Partner with low-cost permanent housing
  - Use low-cost rental models to help build a credit score
- Forceful
  - Create minimum periods of stay (candidate needs to produce this idea)
  - Only accept people with the intention of transitioning to permanent housing

Q4 – Temporary Housing Optimisation

The client decides to restrict the length of stay per homeless person to 3 months. However, given the shorter time period, only 85% of homeless people can find permanent residency after their term finishes.

Considering the above, how many homeless people will be able to be transitioned to permanent housing?

Answers

- 600 capacity x 12/3 months = 2,400 homeless people cycling through temporary housing in a year
- 2,400 x 85% = 2,040 homeless people transitioning to permanent housing per year
- 2,040 x 5 years = 10,200 total homeless people transitioned to permanent housing after 5 years

Q5 – Financial Evaluation

The client now needs to justify to the federal government that this strategy is an effective use of financial resources. If each apartment costs $25M to establish, and $4M per year in ongoing operational costs such as rent, labour, and maintenance, is this strategy financially sound?

Answers

This is essentially a cost reduction problem; whether the cost savings offset the cost of investment.

- Cost of investment: $450M
  - $25M + $4M x 5 years = $45M per apartment over 5 years
  - $45M x 10 = $450M total investment
- Cost savings:
  - $25K per year per homeless person transitioned for the following year (Payment registered yearly)
  - Cost savings from first year: $0
  - Cost savings from second year: $25K x 2040 = $51M
  - Cost savings from third year: $25K x 4080 = $102M
  - Cost savings from fourth year: $25K x 6120 = $153M
  - Cost savings from fifth year: $25K x 8160 = $204M
  - Total Cost savings: $510M
- Net impact: $510M - $450M = $60M cost savings

Synthesis

After your long project, you head down to the local homeless shelter to volunteer and hand out soups at the soup kitchen. Halfway through the line, the soup runs out, and the second volunteer runs to the back to refill the soup container. You realise that standing right next to you serving soup is the Head of the Department of Social Services who asks you for a summary of the case. In the time it takes for the second volunteer refill the soup and bring it back outside, what will you say?

Potential Answer

- Build transitionary housing with a 3-month contract term
  - This will exceed the goal, helping reduce homelessness by 10.2%
  - This will also drive $60M in net cost savings

Commentary

‘No Place to Call Home’ was the first of many public sector cases I wrote, each exploring an issue I either found interesting or felt passionate about. Learning about the severity of homelessness in countries around the world made me question how such a prevalent issue could be either prevented or solved. Diving deeper into government homelessness spending, I found that a majority of the budget was typically spent on social housing, which inspired me for this case.

Some common blind spots seen in candidates were brainstorming ways to impact the initial driver/source of an issue or KPI (in this case reducing the number of people becoming homeless, or screening the homeless people entering social housing), use of bottom-up supply-side market sizing with numbers that are more likely to be available by the DSS, and use of forceful strategies. Candidates who took a structured approach to brainstorming were often more likely to produce the full range of ideas.

This case also explores financial viability from a unique perspective, where instead of direct revenue drivers, candidates evaluate the impact of cost savings compared to incremental costs.

This case also encourages candidates to explore how the time scale of a goal will impact financial outcomes. Strong candidates will recognise the exponential growth in cost savings as governments no longer need to pay out financial support to homeless people who have been rehoused and approach their calculations accordingly.

Overall, ‘No Place to Call Home’ is a well-rounded case that tests a candidate's ability across a range of areas within a social impact context.

Case #13

A Second Chance

Difficulty

Outcomes Tested:

- Issue Diagnosis
- Mathematics

Industry:

Public Sector

Case #13 – A Second Chance

Brief

Your client is the Head of Criminal Justice on behalf of the Australian Government. They oversee the prison and correctional facility ecosystem in Australia and are in charge of reducing the recidivism rate. They have come to you (Insert Candidate Name) Consulting Group asking for your help to identify key drivers behind recidivism and ways to reduce it.

Clarifying Information

- *Recidivism is the tendency of a convicted criminal to re-offend or return to criminal behaviour after being released from prison or completing a sentence*
- *Recidivism is measured by the return to prison rate, which is the % of prisoners who return to prison within two years of their release*
- *No specific target for recidivism*
- *No context or trend around increasing recidivism rates*
- *Client oversees both private and public prison systems*
- *The business model of private prisons is that the government provides a fixed per diem rate for each prisoner they house. These prisons generate profit by creating cost efficiencies when providing a similar service, profiting from the difference*
- *The process by which prisoners get assigned to public or private prisons is randomised and is a decision made by the judge during the time of sentencing*

Exemplar Framework

- *Analysis*
  - *Demographics of those who recidivated (age, income, geography, race)*
  - *Types of crimes and sentences*
  - *The prisons they originated from*
  - *Life after release*
- *Strategy*
  - *Overall level of crime*
    - *Improve education and employment outcomes*
    - *Investment into the reduction of substance abuse*
  - *Sentencing*
    - *Ensure fair sentencing and opportunities for convicted to enter rehabilitation programs*
  - *Prison time*
    - *Ensure high-quality care*
    - *Investment into education programs, health programs*
    - *Encourage good behaviour*
  - *Re-entry*
    - *Invest in adequate resources and employment opportunities*
    - *Post release supervision*

Q1 – Insight into Recidivists (repeat offenders)

The client has sourced some information on repeat offenders and the types of prisons they originated from.

Provide candidate with Exhibit #1

What does this chart show about the different types of prisons in Australia?

Provide following information when asked:

- There are 40,000 prisoners in Australia
- 25% of which are housed in private prisons
- 75% are housed in public prisons

Answers

- *Calculating the return to prison ratio paints a different story than what is initially perceived:*
  - *10K total prisoners in private prisons, 5K of which return, meaning a recidivism rate of 50%*
  - *30K total prisoners in public prisons, 6K of which return, meaning a recidivism rate of 20%*
- *Private prisons have significantly higher recidivism rates when compared to public prisons*

Exhibit #1 – Recidivism by Prison Type

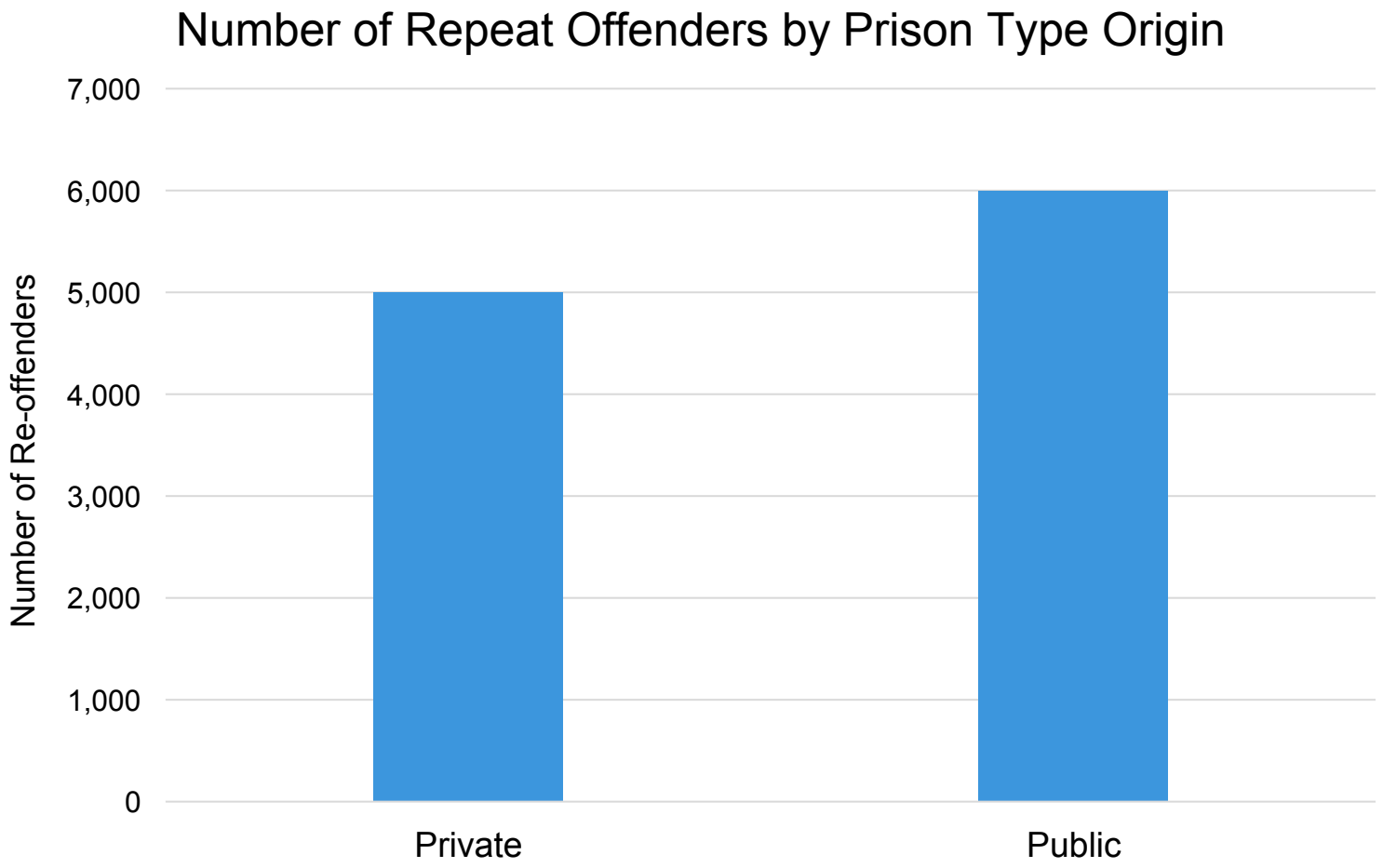


Figure #1 - Aggregate Repeat Offenders by Prison Type Origin

Q2 – Insight into Private vs Public Prisons

The client has sourced some information comparing private and public prisons.

Provide candidate with Exhibit #2

What insights does this exhibit reveal?

Answers

- *The per diem rate for private prisons is $20K lower than that of public prisons per year*
  - *$1Bn / 10,000 prisoners = $100K per year per prisoner*
  - *$3.6Bn / 30,000 prisoners = $120K per year per prisoner*
  - *This makes sense as otherwise there would be no incentive for the government to fund private prisons*
- *The COGS ratios for each prison are the same at 75%, but each prisoner gets $15K less in food, amenities, etc per year (or private prisons have greater cost efficiencies)*
  - *$750M / 10,000 prisoners = $75K per year*
  - *$2.7Bn / 30,000 prisoners = $90K per year*
- *Fixed costs are smaller in proportion for the private which suggests either cost efficiencies or lower spend*
- *Public prisons break even exactly (which makes sense as they are not profit driven)*

Exhibit #2 – Industry Financials of Private and Public Prisons

Private Prison	Industry Aggregate Value (Annual)
Revenue *(Diem Rate x # Prisoners)*	$1Bn
COGS *(Meals, clothing, bedding, programs, health services, etc)*	$750m
Rent / Maintenance *(Fixed operational costs)*	$50m
Labour / Salaries *(Fixed operational costs)*	$50m

Figure #2 - Aggregate Financials of Private Prisons

Public Prison	Industry Aggregate Value (Annual)
Total Funding *(Government Funding)*	$3.6Bn
COGS *(Meals, clothing, bedding, programs, health services, etc)*	$2.7Bn
Rent / Maintenance *(Fixed operational costs)*	$450m
Labour / Salaries *(Fixed operational costs)*	$450m

Figure #3 - Aggregate Financials of Public Prisons

Q3 – Private Prison Business Model

The client believes that private prisons are cutting corners when it comes to providing adequate care to prisoners.

What is your commentary on this?

Potential Answers

- *It is plausible that private prisons are cutting corners due to their business model being focused on cost cutting*
- *It can be however argued that there is a chance that they have accrued cost savings in the sourcing of amenities and provision of care, but given all else equal, it is a plausible explanation behind the higher recidivism rates*

Q4 – Strategies

Brainstorm some strategies to address the potential risk that private prisons are cutting corners on providing adequate care.

Potential Answers

- *Supportive*
  - *Provide funding or partner with NFPs for re-employment and education programs to be run at private prisons*
  - *Increase per diem payments with conditions attached to the use of funds towards improving care*
- *Forceful*
  - *Set strict monitoring and accountability around the minimum level of care*
  - *Introduce mandatory requirements for the minimum level of care*
  - *Cost sharing – shift/share the cost burden of recidivism to private prisons*
  - *Create penalties for inadequate care*
- *Renegotiate contract terms to better align shared interest towards prisoner wellbeing and rehabilitation*
  - *Switch to a KPI-based system that rewards prisons for ideal behaviour*
  - *Fix revenue to capacity of prison, so that the prison will be more focused on cycling prisoners through to cut COGS expenditure*

Q5 – Fine and Reward Pricing

The client decides to introduce fines to private prisons for each prisoner that recidivates, as well as a monetary reward for every prisoner that does not. How should the client price this fine and reward?

Answers

- *The ideal price will be when the cost of paying the fine is greater than the cost of providing adequate education / rehabilitation services*
- *Therefore, the cost of the fine should be greater than $15K per prisoner (difference in COGS spend) multiplied by the years the prisoner was sentenced for*
- *However, it is expected that even with these changes, there will be a "natural" base recidivism rate of around 20% (as reflected in the public prisons). Therefore, the reward of rehabilitating the other 80% must cover the fines of the 20% that don't*
- *Therefore, the minimum reward must be greater than $3.75K ($15K / 4) per ex-prisoner multiplied by the average years a recidivated prisoner was sentenced for (you can't charge the exact year, as there are 4x more rehabilitated prisoners than recidivated, which makes matching difficult)*

Synthesis

After your long project, you head down to the private prison to inform the warden of the proposed changes. As you are passing through security you hear a call from down the hallway "(Insert Candidate Name)". It's the Head of Criminal Justice! They tell you that they are running late to a board meeting with the government and need a summary of the project recommendation. In the time it takes for you to get through security, what will you tell them?

Potential Answer

- *The recidivism rate is predominately driven by private prisons which have potentially been cutting corners when it comes to providing adequate care*
- *To address this, we recommend introducing fines on recidivism equal to $15K per recidivated prisoner multiplied by their sentence, and rewards to rehabilitated prisoners equal to $3.75K multiplied by the average sentence of recidivated prisoners*
    - *This will align the incentives of private prisons to that of public*
    - *Increase the provision of care to prisoners in private prisons*
    - *Reduce recidivism rates*

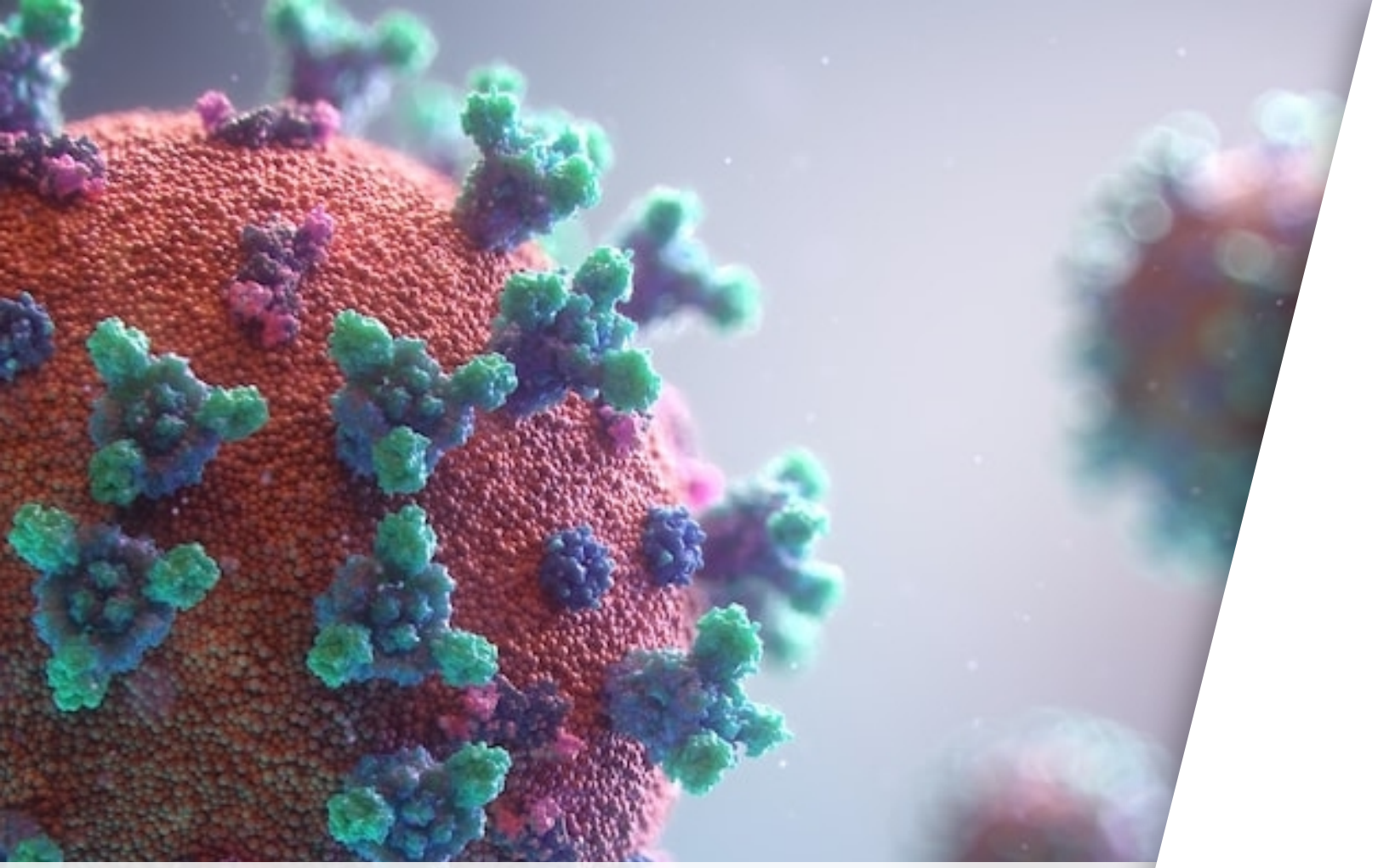
Commentary

‘A Second Chance’ was a case inspired by an interesting industry report I read years before I started writing cases. It highlighted the common criticisms of private prisons, and how their business model was misaligned with the objectives of the Australian correctional facility system. In this case, candidates conduct issue analysis to reveal this misalignment and are then challenged to brainstorm strategies to address it.

This case highlights the importance of using percentages and absolute numbers to navigate through the exhibits and derive key insights. This can be seen in the first exhibit, where candidates can make the mistake of looking at the absolute numbers rather than the ratio of prisoners who recidivate to the total number of prisoners in that prison type. Furthermore, in the second exhibit, it is important to scale the numbers to a per-prisoner cost to make the income statements more comparable. Strong candidates often identify the differences in the line items and provide further judgement around the “why” and ”so what” of these discrepancies, making a link back to their key hypothesis.

Moving into strategy, common blind spots that many candidates have, are the “forceful” strategies. It is important to recognise that without fixing the core issue, any further funding will fuel the private prisons’ bottom line rather than improve the quality of life for the prisoners. Furthermore, in pricing the fines and rewards, it is critical for the candidate to recognise the time scale of a prisoner’s sentence. Otherwise, a prison may still be able to minimise its losses by not providing adequate care for a 10-year sentence and paying a one-time fine for each prisoner. That is: the cost of providing adequate care for the entire lifetime of a prisoner’s sentence MUST be less than the price of the fine.

Overall, ‘A Second Chance’ is an intermediate case that tests a candidate’s ability to think critically and strategise accordingly.



Case #14

Catching a Case

Difficulty

Outcomes Tested:

- Decision Making
- Mathematics

Industry:

Healthcare

Case #14 – Catching a Case

Brief

Your client is the Head of the Australian Department of Health. Within the past few months, there has been a major outbreak of a new viral infection, COVID-20. COVID-20 possesses similar symptoms and transmission properties to COVID-19, however, none of the existing COVID-19 vaccines offer adequate protection against this new virus. Fortunately, two new vaccines have been recently introduced to the market; Vaccine A and Vaccine B. The client is unsure as to which vaccine to roll out nationally and has come to you Mc(Insert Candidate Name) and Company, for a recommendation.

Clarifying Information

- *Can assume COVID-20 has the exact same symptoms, severity, and transmission properties as COVID-19, but require a new vaccine*
- *Rollout is for all of Australia*
- *No information on what other countries around the world have been preferencing*
- *Vaccines have slightly different properties and the client would like to hear about what points of difference are important to consider for a national rollout*
- *No need to consider alternate options / vaccines*
- *No context behind how the virus was introduced or its current infection rates*
- *No key objectives or KPIs, but would like to hear what you think is important*

Exemplar Framework

- *What are the non-financial differences with the vaccines?*
  - *Efficacy – Effectiveness against infection and death*
  - *Safety Profile – Known side effects relative to the population demographics and needs (age and immunocompromised)*
  - *Timing – Time to impact, length of effectiveness, time to administer, rollout timing*
  - *Ease of distribution – Ability to be distributed across the country (temperature needs)*
  - *Coverage – Expected coverage to rural areas*
  - *Production – Is there enough supply to service the required demand?*
  - *Public perceptions – Expected uptake rates*
  - *Expert opinion – Have there been official recommendations from medical professionals?*
- *What are the financial differences between the vaccines?*
  - *Cost to implement*
  - *Indirect revenue or cost savings*
- *Make a selection considering performance across both categories*
  - *Is there scope or compatibility that allows for both vaccines to be rolled out?*

Q1 – Efficacy and Supply Differences

The client is interested in understanding the non-financial differences across both vaccines and has conducted research into the efficacy and supply differences between the two vaccines.

Provide candidate with Exhibit #1

What insights can you gain from this information?

Clarifying Information

- Consumer uptake rate is calculated as a proportion of consumers who choose to get vaccinated over the consumers who have access to vaccinations (national coverage)

Answers

- *Efficacy of Vaccine B is higher as it has a lower overall death rate (0.02% compared to 0.025%)*
- *Distributing Vaccine A will result in higher vaccination rates (~80% compared to 75%)*
- *Distributing Vaccine A will give vaccine access to a larger proportion of the population which is important for maintaining a positive public perception*

Exhibit #1 – Efficacy and Supply Differences Between Vaccines

	Vaccine A	Vaccine B
Infection Rate	25%	40%
Hospitalisation from Infected Rate	4%	2.5%
Death from Hospitalisation Rate	2.5%	2%
National Coverage	90%	75%
Consumer Uptake Rate	89%	100%

Figure #1 – Efficacy and Supply Differences

Q2 – Comparing Deaths

The client wants to understand which vaccine will result in fewer overall deaths and has provided you with the following information regarding the impact of COVID-20 on the un-vaccinated population.

For the un-vaccinated:

- Infection rates are 50%
- Hospitalisation from infection rates are 5%
- Death from hospitalisation rates are 10%

Assuming the Australian population is 25 million, which vaccine will result in the lowest overall deaths?

Case #14 – Catching a Case

Answers

	Vaccine A	Vaccine B	Unvaccinated
Overall Death Rate	0.025% (25% x 4% x 2.5%)	0.02% (40% x 2.5% x 2%)	0.25% (50% x 5% x 10%)
Vaccinated Population	20M (80% x 25M)	18.75M (75% x 25M)	
Vaccinated Deaths	5K (20M x 0.025%)	3.75K (18.75M x 0.02%)	
Unvaccinated Population	5M (20% x 25M)	6.25M (25% x 25M)	
Unvaccinated Deaths	12.5K (5M x 0.25%)	15.625K (6.25M x 0.25%)	(Can be shortcutted by increasing Vaccine A deaths by a factor of 25%)
Total Deaths	17.5K (5K + 12.5K)	19.375K (3.75K + 15.625K)	

- Vaccine A has a lower overall death rate

Answers (alternative method)

	Vaccine A	Vaccine B	Unvaccinated
Overall Death Rate	0.025% (25% x 4% x 2.5%)	0.02% (40% x 2.5% x 2%)	0.25% (50% x 5% x 10%)
Weighted Vaccinated Death Rate	0.02% (80% x 0.025%)	0.015% (75% x 0.02%)	
Weighted Unvaccinated Death Rate	0.05% (20% x 0.25%)	0.0625% (25% x 0.25%)	
Net Death Rate	0.07% (0.02% + 0.05%)	0.0775% (0.015% + 0.0625%)	
Total Deaths	17.5K (25M x 0.07%)	19.375K (25M x 0.775%)	

- Vaccine A has a lower overall death rate

Q3A – Cost Analysis

The client now wants to analyse the costs associated with each option. What cost drivers should the client consider when evaluating each option?

Potential Answers

- *Vaccine Associated Costs*
  - *Cost per vaccine*
  - *Production and distribution costs*
  - *Administration costs (labour)*
  - *Faulty / wasted vaccines*
- *Impact of COVID-20 Costs*
  - *Hospitalisation costs*
  - *Economic impact of those infected*

Q3B – Cost Analysis

The client has conducted some analysis regarding costs.

Provide candidate with Exhibit #2

Which vaccine would be cheaper for the government?

Clarifying Information

- Assume one vaccine per person
- The government will buy as many vaccines as it is needed to hit the maximum capacity

Exhibit #2 – Cost Analysis

	Vaccine A	Vaccine B
Cost per Vaccine	$1	$1
Labour Cost per Vaccine Administered	$1	$1

Figure #2 – Cost per Vaccine

Cost Driver	Cost ($)
Cost per Hospital Stay	$100
Cost to Economy per Infected	$1

Figure #3 – Cost of Contracting COVID-20

Answers PT1

	Vaccine A	Vaccine B
# Vaccines Bought	22.5M (90% x 25M)	18.75M (75% x 25M)
Cost of Buying Vaccines	$22.5M (22.5M x $1)	$18.75M (18.75M x $1)
# Vaccines Administered	20M (25M x 80%)	18.75M (25M x 75%)
Cost of Administering Vaccines	$20M (20M x $1)	$18.75M (18.75M x $1)
Total Vaccine Cost	$42.5M ($22.5M + $20M)	$37.5M ($18.75M + $18.75M)

Answers PT2

	Vaccine A	Vaccine B
Vaccinated Hospitalised Population	200K (20M x 25% x 4%)	187.5K (18.75M x 40% x 2.5%)
Unvaccinated Hospitalised Population	125K (5M x 50% x 5%)	156.25K (6.25M x 50% x 5%)
Total Hospitalised	325K (200K + 125K)	343.75K (187.5K + 156.25K)
Cost of Hospitalisation	$32.5M (325K x $100)	$34.375M (343.75K x $100)
Vaccinated Infected Population	5M (20M x 25%)	7.5M (18.75M x 40%)
Unvaccinated Infected Population	2.5M (5M x 50%)	3.125M (6.25M x 50%)
Total Infected Population	7.5M (5M + 2.5M)	10.625M (7.5M + 3.125M)
Total Infected Cost	$7.5M (7.5M x $1)	$10.625 (10.625M x $1)
Total Overall Cost	$82.5M ($42.5M + $32.5M + $7.5M)	$82.5M ($37.5M + $34.375M + $10.625M)

- The costs are the same! Noting that Vaccine A has lower impact of COVID costs which is more desirable

Q4 – Simultaneous Release

The client is considering the possibility of rolling out both vaccines simultaneously. What would be the pros and cons of doing so?

Potential Answers

- *Pros*
  - *From an effectiveness point of view, this could be a good idea as the overall performance of KPIs such as vaccinated death rates, number of deaths, coverage, and vaccinated population would improve by averaging out, combining the strengths of each vaccine*
- *Cons*
  - *Vaccine costs will be significantly more expensive when providing both options*
  - *Cost of contracting COVID-20 may increase as a higher proportion of total costs*
  - *Economic impact of those with COVID-20 may be higher as the population may choose to opt in for vaccine B for the lower vaccination death rate, resulting in increased infection costs (hospitalisation rates across both vaccines are the same and hence so will be the costs)*
  - *May create decision fatigue for the population which may slow down vaccination rates*
  - *Will have significantly greater waste, with high levels of cannibalisation*

Synthesis

After completing your project, you head down to the local testing clinic to receive a PCR test. As the nurse is preparing your test, you get a call from the client who is looking for an update on the project. In the time it takes for the nurse to prepare the swap and do your test, provide a summary of the project.

Potential Answer

- *If cost is not a major constraint, roll out both vaccines simultaneously to achieve the best overall performance in protecting the population against COVID-20.*
- *However, if cost is a major constraint, roll out vaccine A for the following reasons:*
  - *Lower the overall number of deaths by approximately 10%*
  - *Cost structure is better for the long term as lower infection rates will reduce economic cost of COVID-20 given all else equal*
  - *Higher coverage, which is more equitable and results in higher vaccination rates*

Commentary

'Catching a Case' is my take on a contemporary healthcare case. In light of the recent pandemic, I thought it would be interesting to explore the decisions made around the COVID-19 vaccine rollout through the perspective of a consultant.

This is a calculation heavy case, and while the approach isn't too difficult, the quantity and difficulty of the calculations make this a 4/5 difficulty case. Candidates are tested on their ability to work with zeros and percentages, whilst combining business acumen and industry perspective to guide the approach to the maths.

Strong candidates will develop a strong framework that encapsulates a wide range of non-financial considerations and will also identify the differences in cost drivers, especially how the cost of vaccines bought will vary from the cost of vaccines administered. Strong candidates will also be able to make an opinion about which cost structure is more desirable for each vaccine in the long term, even if the current costs are the same.

Common blind spots are in the cost drivers, where candidates may not consider the wider scale economic implications of hospitalisation and infection rates. Another blind spot is the cannibalisation effect that may occur from launching two vaccines with varying efficacies, which can potentially negatively impact rollout time or uptake rates.

Overall, 'Catching a Case' is a quant heavy case that balances strong healthcare considerations. Fun detail is that this case was written on the back of a piece of paper during a bus ride from Rome to Florence, before being put into a proper case format.

Case #15

ICC a Problem

Difficulty

Outcomes Tested:

- Issue Diagnosis
- Chart Reading
- Mathematics

Industry:

Education

Brief

Your client is Brian Burfitt of the University of New South Wales (UNSW) business school. He oversees the UNSW case team, which competes in international consulting case competitions (ICCs) held all around the world. These ICCs are highly competitive, and UNSW has had an impressive history of winning multiple ICCs within a year. Over the past few years, Brian has noticed that UNSW's success rate of winning these ICCs hasn't been up to the usual high standards and has come to you Mc(Insert Candidate Name) and Company, asking for your help in understanding why this has been the case and providing any recommendations around how UNSW can improve their performance.

Clarifying Information

- *ICCs*
  - *These are competitions where business schools around the world invite students representing their respective universities to gather and solve problems for a client company*
  - *These teams consist of four students, usually ones specialising in different areas: analysis, strategy, financials*
- *Case Club*
  - *The case club runs bi-yearly recruitment intakes, where a cohort of students are trained up to competition level and are then selected by the committee to represent UNSW in competitions*

Exemplar Framework

- *Understanding why UNSW's performance in ICCs has dropped*
  - *Analysing our history with ICCs*
  - *Looking into feedback*
  - *Internal vs external Factors*
- *Strategising how to improve*
  - *Team selection*
  - *Team preparation*
  - *Team performance overseas*

Q1 – Looking into Historic ICC Performance

Brian is interested in analysing UNSW's historic performance and has provided some information regarding the recent success rate.

Provide candidate with Exhibit #1

What key insights can you identify?

Answers

- UNSW's success rate has decreased from 50% in 2018 to 35% in 2022
- UNSW has entered more Asian competitions over the past 5 years, but its # of wins has remained the same
- Ultimately, UNSW's falling success rate has been a result of not winning Asian ICCs

Candidate should look to direct the case towards investigating feedback sheets provided at these ICCs to understand why UNSW has not been performing as well.

Bonus marks to candidates who identify that these feedback sheets should be compared to those of the winning teams as well.

Exhibit #1 – UNSW's track record with ICCs

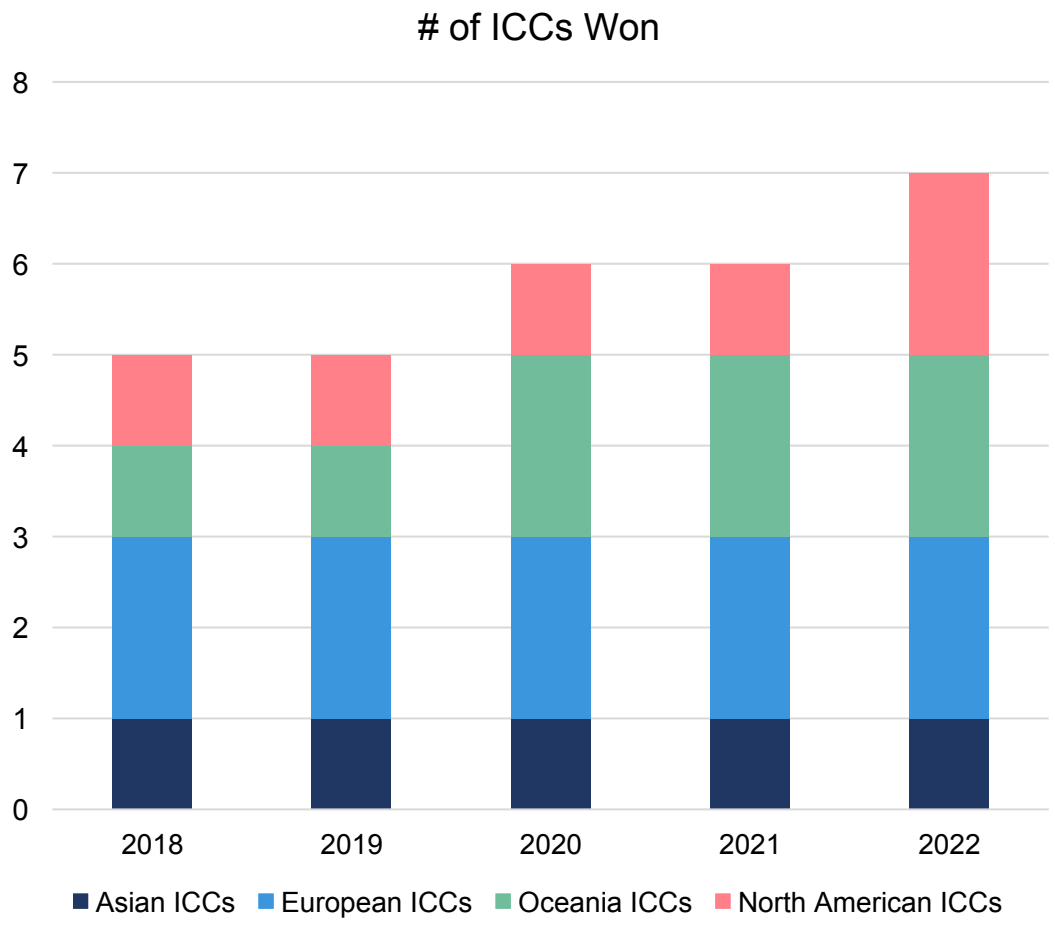


Figure #1 – Number of ICC's won

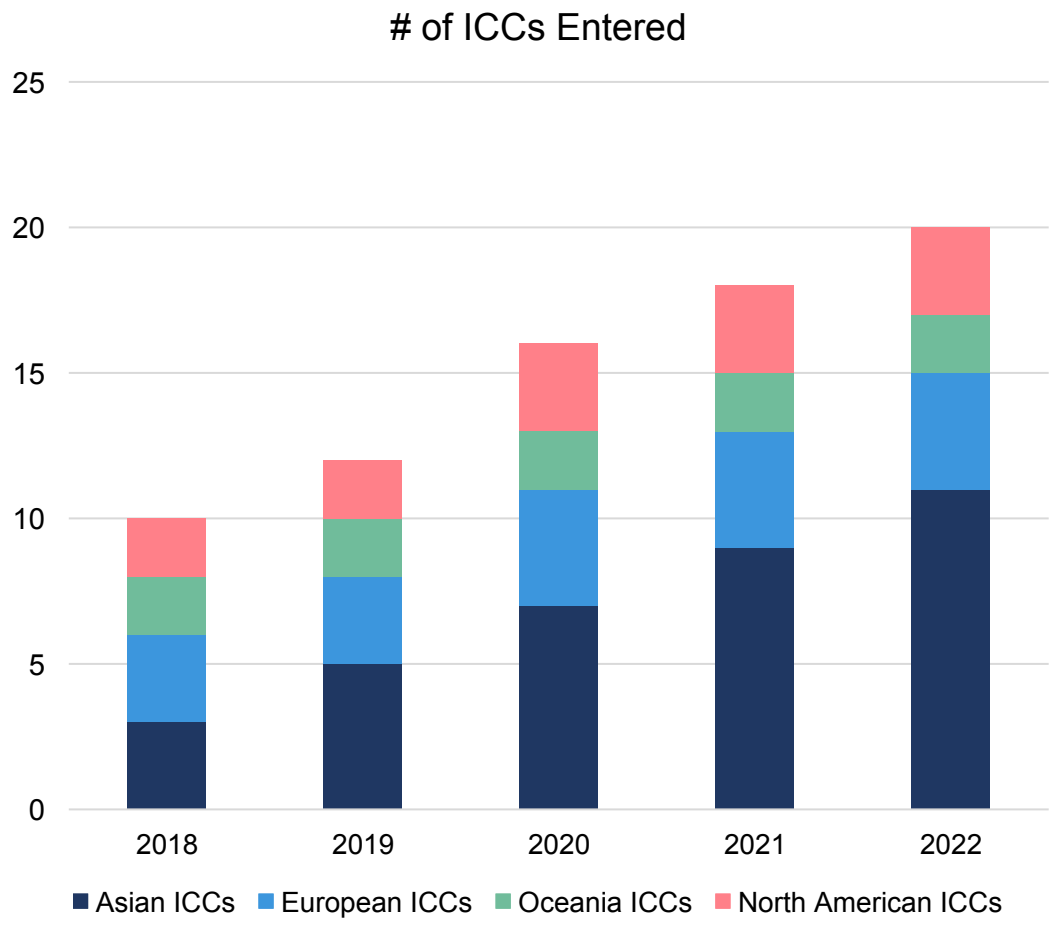


Figure #2 – Number of ICC's Entered

Q2 – Diving Deeper into Declining Asian ICC Performance.

Brian has sourced feedback sheets from the judges, comparing the performance of UNSW with another competing university NUS.

Provide candidate with Exhibit #2

What key insights can you identify?

Exhibit #2 – Feedback Sheets from Asian ICCs

Criteria	Weighting	Judge's Score
Creativity	30%	9/10
Presentation	20%	10/10
Feasibility	20%	8/10
Technical Understanding	30%	4/10

Table #1 – UNSW's Feedback Sheet

Criteria	Weighting	Judge's Score
Creativity	30%	9/10
Presentation	20%	7/10
Feasibility	20%	7/10
Technical Understanding	30%	8/10

Table #2 – NUS's Feedback Sheet (Winner)

Answers

- Despite having the same score, NUS scores higher in a higher weighted section
- UNSW needs to build their technical understanding in Asian ICCs
- Candidate can calculate the weighted scores:

Criteria	Weighting	Judge's Score	Weighted Score
Creativity	30%	9/10	27%
Presentation	20%	10/10	20%
Feasibility	20%	8/10	16%
Technical Understanding	30%	4/10	12%
Total	100%	31/40	75%

Table #1 – UNSW's Feedback Sheet

Criteria	Weighting	Judge's Score	Weighted Score
Creativity	30%	9/10	27%
Presentation	20%	7/10	14%
Feasibility	20%	7/10	14%
Technical Understanding	30%	8/10	24%
Total	100%	31/40	79%

Table #2 – NUS's Feedback Sheet (Winner)

Q3 – Brainstorming

Brian wants you to brainstorm some ideas on how UNSW can bridge the technical expertise gap within UNSW teams.

What are some potential strategies?

Potential Answers

- Run more technical training sessions for the case teams
- Include a technical expert on the team

Make sure the candidate produces training and technical experts, otherwise direct them to produce the solution.

Q4 –Technical Training Sessions

Brian is interested in exploring the idea of running technical training sessions for the competing teams. He has provided some research on the impact training has on the outcome of the ICC.

Provide candidate with Exhibit #3

How many practice cases and training sessions should the teams do?

Provide following information when asked:

- Teams on average only have 25 hours of prep time

Exhibit #3 – Impact of Practice Cases and Technical Training Sessions

# of Practice Cases	Marginal Probability of Winning
1	20%
2	35%
3	45%
4	55%
5	60%

Note: Practice cases require 5 hours of time each

Table #3 – Marginal Benefit of Practice Cases

# of Technical Training Sessions	Marginal Probability of Winning
1	20%
2	25%
3	30%
4	35%
5	40%

Note: Training sessions require 5 hours of time each

Table #4 – Marginal Benefit of Training Sessions

Answers

Candidate should identify that there are 6 combinations of practice cases and training sessions. They are then able to calculate the marginal probability of winning:

Bonus marks if the candidate realises that the point of indifference is when the marginal benefit of practice cases is equal to the marginal benefit of technical training sessions.

# of Practice Cases	# of Training Sessions	Calculation	Marginal Probability of Winning
0	5	0% + 40%	40%
1	4	20% + 35%	55%
2	3	35% + 30%	65%
3	2	45% + 25%	70%
4	1	55% + 20%	75%
5	0	60% + 0%	60%

Takeaway: Case teams should do 4 practice cases and 1 training session to maximise their chances of winning!

Q5 – Include Technical Experts on the Team

Brian is also interested in exploring the idea of including technical experts on the team. Since these experts don't come from a business background, they benefit individually more from practice cases rather than technical training sessions. However, as a team, the more technical experts you have, there comes the risk of groupthink.

Provide candidate with Exhibit #4

Should UNSW start including technical experts on the team? If so, how many?

Exhibit #4 – Impact of Practice Cases and Technical Training Sessions on Technical Experts

# of Practice Cases	Marginal Probability of Winning
1	30%
2	50%
3	65%
4	75%
5	80%

Table #5 – Marginal Benefit of Practice Cases for Technical Students

# of Technical Training Sessions	Marginal Probability of Winning
1	5%
2	10%
3	15%
4	20%
5	25%

Table #6 – Marginal Benefit of Training Sessions for Technical Students

# of Technical Experts on the Team	Marginal Probability of Winning
1	0%
2	-5%
3	-10%
4	-15%

Table #7 – Impact of Groupthink

Answers PT1

Candidate should identify that the optimal amount of practice cases and training sessions is the same as that of the previous section, since all team members will have to do the same # of practice cases and training sessions.

# of Practice Cases	# of Training Sessions	Calculation	Marginal Probability of Winning
0	5	0% + 25%	25%
1	4	30% + 20%	50%
2	3	50% + 15%	65%
3	2	65% + 10%	75%
4	1	75% + 5%	80%
5	0	80% + 0%	80%

Takeaway: Case teams with one or more technical experts should do 4 practice cases and 1 training session to maximise their chances of winning!

Answers PT2

Candidates should also evaluate having a different number of technical experts on the team given the set training regime of 4 practice cases and 1 training session

# of Technical Experts	Calculation	Marginal Probability of Winning
0	75% x 4/4 + 0% x 0/4 - 0	75%
1	75% x 3/4 + 80% x 1/4 - 0	76.25%
2	75% x 2/4 + 80% x 2/4 – 5%	72.5%
3	75% x 1/4 + 80% x 3/4 – 10%	68.75%
4	0% x 0/4 + 80% x 4/4 – 15%	65%

Takeaway: Therefore including 1 technical expert in the team produces the highest likelihood of winning!

Synthesis

On your way to class, you run into Brian in the corridor of the accounting building. He is heading to a meeting with the VPs of Education at the case team and is eager to hear your findings on the case. You are already 5 minutes late to class and don't have much time to spare.

What will you tell Brian?

Potential Answer

- UNSW Case Team's performance has been declining because of the technical skill gap in Asian ICCs
- Include a technical expert in each case team, and run 1 additional technical training session in replacement of a practice case

Commentary

‘ICC a Problem’ was the first ever case I wrote and was intended for helping others in my consulting club prep for their interviews. I was initially hesitant on including it in this casebook as candidates with a background understanding and context behind case competitions have a significant advantage over others. However, due to the sentimental reasons and the significance of this case in kickstarting my case-writing journey, I decided to keep it in the Casebook.

Common blind spots seen in this case are when candidates are transitioning from historical performance to identifying the need to analyse feedback sheets. Most candidates only consider internal factors that may lead to a drop in performance, whereas stronger candidates stood out by considering a holistic range of external factors including the judges themselves. As with most issue diagnosis cases, candidates are encouraged to compare feedback sheets with a competitor to contextualise their performance.

Many candidates struggle with the crux of the case, which is calculating the marginal probability of winning with technical experts. Candidates who have a background in finance are often able to draw parallels to calculating the expected return of a weighted portfolio and can structure their calculations quicker.

Overall, ‘ICC a Problem’ is a fun case for case team members and pays tribute to the international case competition community I have grown so fond of. To all my friends from around the world; namely NUS, Queens, Thammasat, UF, NZ, Melbourne, Rotterdam, Manitoba, CBS, and Alberta, I miss you all and hopefully our paths can cross again sometime in the future!

Case #16

The Elevator Problem

Difficulty

Outcomes Tested:

- Mathematics
- Visualisation

Industry:

Hospitality

Case #16 – The Elevator Problem

Brief

Your client is the property manager of a luxury hotel. They have been receiving customer complaints that the elevator wait times are been particularly long, especially in the morning around breakfast time. As a result, the client is considering the purchase of a second elevator. They have hired you Mc(Insert Candidate Name) and Company, looking for a recommendation on whether they should proceed with the purchase.

Clarifying Information

- *Main objective is to improve customer satisfaction, but costs and feasibility should be a consideration*
- *No context behind why wait times are long, or whether this has been a recurring issue*
- *Just a normal hotel – no niche or specialty*
- *No competitor / industry / company information about other elevator systems*
- *Client is not considering any other options to solve the issue – purely second elevator or not*

Exemplar Framework

- *Non-financial*
  - *Efficiency*
    - *Impact on wait times*
    - *Impact on total/average trip times*
    - *Bottleneck*
    - *Minimisation of elevator movement*
  - *Customer experience*
    - *Impact on the perception of wait times / actual wait times – Can an alternative be considered here?*
    - *Impact on luxury perception*
  - *Implementation*
    - *How will this additional elevator work in conjunction with the existing one*
    - *Is there enough space to create a new elevator?*
- *Financial*
  - *Cost*
    - *Implementation cost of elevator*
    - *Running costs*
  - *Indirect revenue*
    - *Value on saved time*
    - *Value of customer experience*

Q1A – A Single Elevator

The client wants to better understand the current wait times for the elevator. The client provides a snapshot of the elevator demand during breakfast time.

Provide candidate with Exhibit #1

Assuming the elevator is operating optimally and is empty to begin with, how long will it take for all the customers to be transported to their desired destination?

Answers

- *When the elevator is moving optimally, the elevator will continue travelling in one direction until the last request, then reverse into the opposite direction and then continue until the last request is fulfilled*
- *The elevator will spend a total of 8 seconds travelling between levels, and along the way pick up 4 people, and drop them all off at 4 different locations, meaning the total time taken would be 8s + 4 x 5s + 4 x 5s = 48s*

Exhibit #1 – Elevator demand during breakfast time

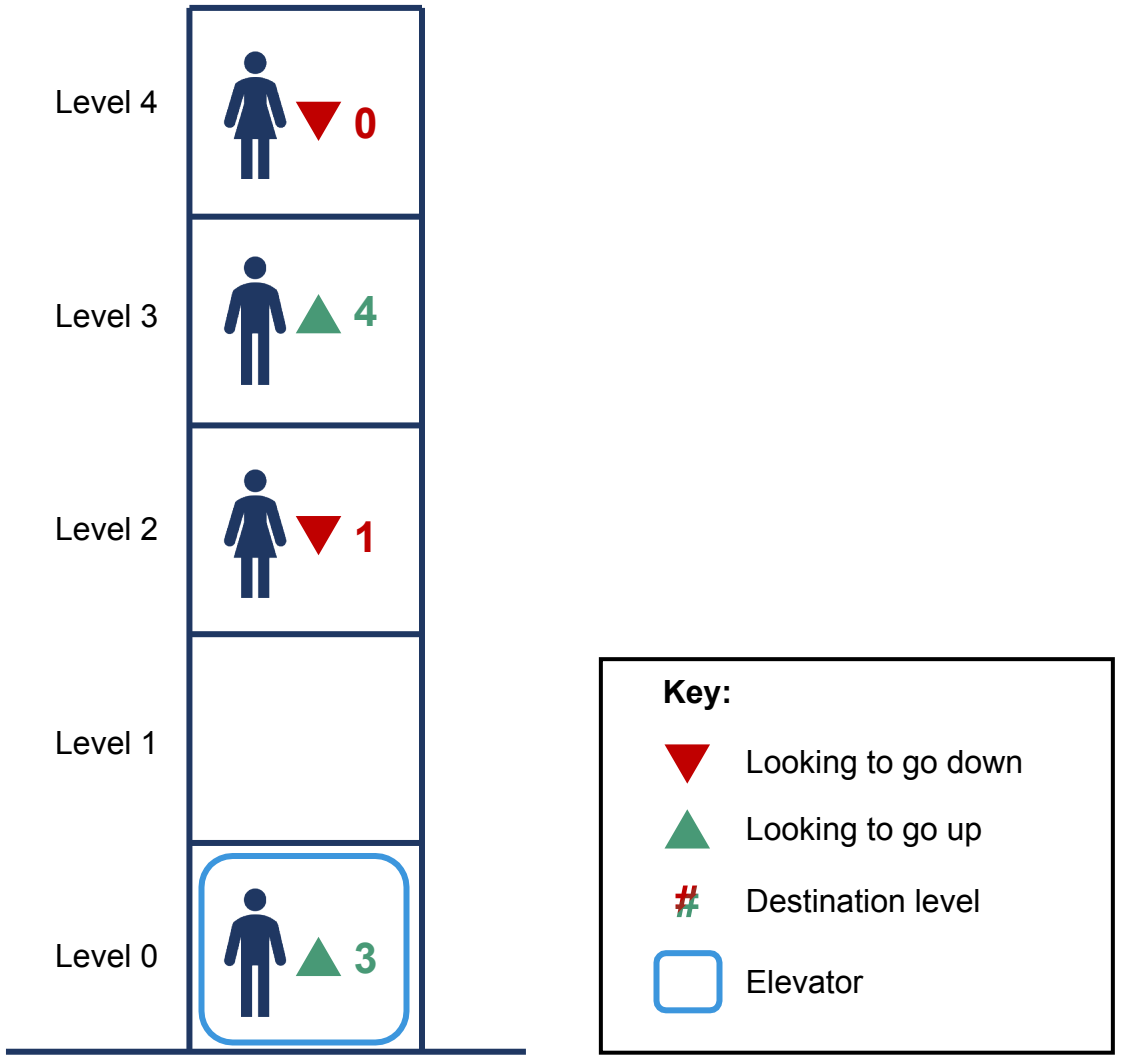


Figure #1 – Elevator Demand

Action	Time Taken
Moving between levels	1 second between each level
Picking up or dropping off passengers	5 seconds
Picking up and dropping off passengers	10 seconds

Figure #2 – Timing Breakdown

Q1B – A Single Elevator

Assuming all customers press the elevator button at the same time, what is the average wait time for the elevator to arrive at their level?

Clarification: Wait time is defined as the time it takes for the elevator to arrive at the departure level from when the button is first pressed (don't consider time taken entering the elevator as a part of wait time)

Answers

- *When the elevator is moving optimally, the elevator will go from level 0 > level 3 > level 4 > level 2 > level 1 > level 0*
- *Person on level 0 will wait 0s*
- *Person on level 3 will wait 8s (5s + 3 x 1s)*
  - *Person on level 0 gets in the elevator, and the elevator travels to level 3*
- *Person on level 4 will wait 19s (8s + 10s + 1 x 1s)*
  - *Person from level 0 gets off the elevator and person on level 3 gets in, and the elevator travels to level 4*
- *Person on level 2 will wait 31s (19s + 10s + 2 x 1s)*
  - *Person from level 3 gets off and person on level 4 gets in, and the elevator travels to level 2*
- *Average wait time: 14.5s ((0s + 8s + 19s + 31s) / 4)*

Q1C – A Single Elevator

What will the average estimated time to destination be?

Clarification: Estimated time to destination is defined as the time it takes for the person to exit the elevator at their desired level from when the button is first pressed (can be thought of as wait time + travel time)

Answers

- *Can be thought of as wait time + 5s (getting in elevator) + 5s (getting out elevator) + travel time + waiting time for people to get off the elevator if necessary*
- *Person on level 0 ETD will be 13s (0s + 10s + 3 x 1s)*
- *Person on level 3 ETD will be 24s (8s + 10s + 1 x 1s + 5s)*
- *Person on level 4 ETD will be 48s (19s + 10s + 4 x 1s + 10s + 5s)*
  - *Need to pick up and drop off person from level 2 in between, and drop off person from level 3*
- *Person on level 2 ETD will be 42s (31s + 10s + 1 x 1s)*
- *Average ETD: 31.75s*
  - *(13s + 24s + 48s + 42s) / 4*
  - *127 / 4*

Q2A – Double Elevators

If there were two elevators both starting at level 0, how would you split the demand across the two elevators?

Potential Answers

- *Ideally, groups heading towards the same / similar location should be grouped together (destination dispatch)*
- *One elevator serves all the people wanting to go up, and one elevator serves all the people going down*
- *Other possibilities could be based around channelling (certain elevators serve certain levels split by region or odd/even)*
- *Can adopt a closest-first mindset (if elevators started at different locations)*

Q2B – Double Elevators

If one elevator was to serve demand moving upwards, and the other to serve demand moving downwards, what will the new average wait time and ETD be?

Answers

- *Average wait time*
  - *Person on level 0 waits 0s*
  - *Person on level 3 waits 8s (5s + 3 x 1s)*
  - *Person on level 4 waits 4s (4 x 1s)*
  - *Person on level 2 waits 11s (4 x 1s + 5s + 2 x 1s)*
  - *Average wait time 5.75s ((0s + 8s + 4s + 11s) / 4)*
- *Average ETD*
  - *Person on level 0 ETD will be 13s (0s + 10s + 3 x 1s)*
  - *Person on level 3 ETD will be 24s (8s + 10s + 1 x 1s + 5s)*
  - *Person on level 4 ETD will be 28s (4s + 10s + 4 x 1s + 10s)*
  - *Person on level 2 ETD will be 22s (11s + 10s + 1 x 1s)*
  - *Average wait time 21.75s ((13s + 24s + 28s + 22s) / 4)*
- *Commentary*
  - *Average wait time and average ETD will improve by ~60% and ~30% respectively*
  - *Total time to deliver all individuals is also now reduced to 28s from 48s (candidate should realise total time to destination will just be the longest ETD)*
  - *Limitation is that this is only for this particular configuration of demand*

Q3 – Prioritisation

The client wants to understand how the elevators should prioritise demand if they are both travelling in the same direction

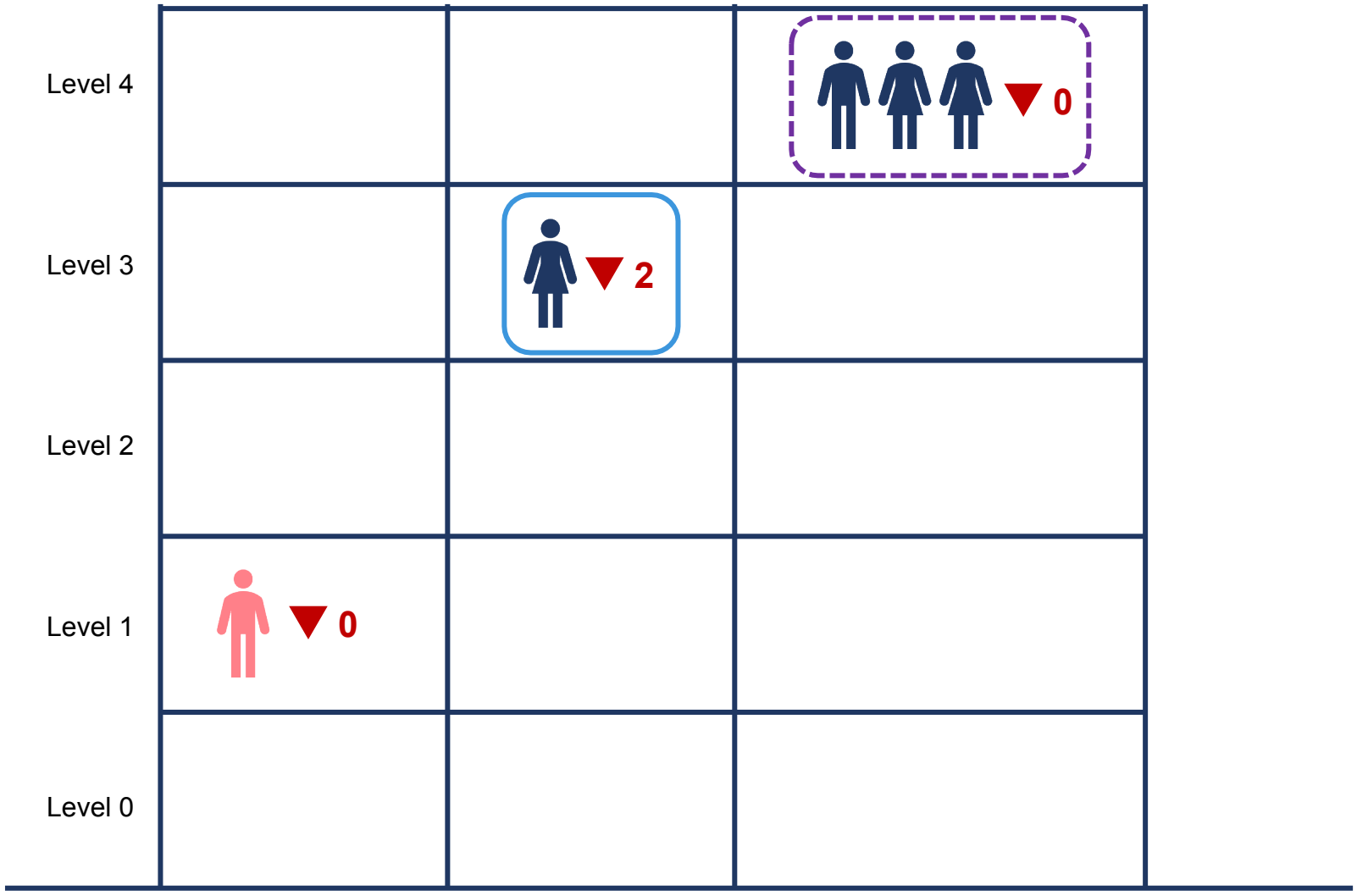
Provide candidate with Exhibit #2

If each elevator is already moving with passengers inside, which elevator should pick up the person on level 1?

Answers

- *Candidate should clarify which KPI the client is trying to maximise – individual customer experience or overall customer experience as it would shape the recommendation*
- *From an individual wait time and ETD perspective:*
  - *Elevator #1 has a 7s wait (5s + 2 x 1s), while elevator #2 has a 3s wait (3 x 1s)*
  - *Elevator #1 has an ETD of 18s (7s + 10s + 1 x 1s), while elevator #2 has an ETD of 14s (3s + 10s + 1 x 1s)*
  - *Therefore Elevator #2 can get to person on level 1 the fastest and deliver them the fastest*
- *From an overall customer experience perspective:*
  - *Sending elevator #2 will cause a delay in 3 peoples ETD of 5s, resulting in a net cost of 15s (3 x 5s)*
  - *Sending elevator #2 will result in an incremental average increase in ETD by 2.2s ((-4s + 5s + 5s + 5s) / 5 compared to sending elevator #1*
  - *Therefore, the client should choose elevator #1 if they are prioritising overall customer experience over individual*

Exhibit #2 – Elevator demand alternate scenario



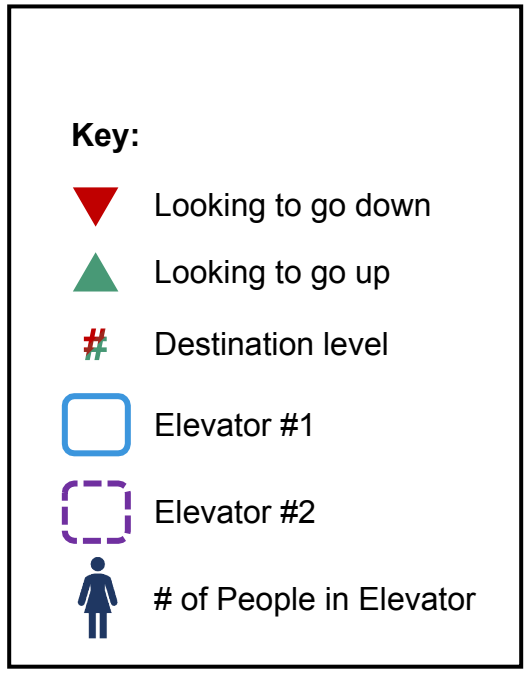


Figure #3 – Elevator Demand

Synthesis

After completing your project, you leave your hotel room on the top floor to get some fresh air outside. Just as the elevator doors are closing, the hotel property manager rushes in last minute. They are running late to a board meeting on level 1 and are interested in an update on your recommendation. In the time it takes for the elevator to pick up and drop off people all the way down to level 1, give a summary of the case.

Potential Answer

- *Purchase the second elevator and program it so that it delivers people who are heading to similar destinations together, making sure to prioritise minimising the average ETD*
    - *This will drive a potential 60% reduction in wait time, and a potential 30% reduction in average ETD*

Commentary

'The Elevator Problem' is my adaptation of a popular question asked in coding interviews (Design an elevator system). The thinking behind elevator systems was extremely fascinating to me, so I turned it into a consulting-style case for candidates to work through.

This case encourages candidates to use strong visualisation techniques similar to those developed in the game of Chess. It can be common for candidates to make silly mistakes when completing their calculations, so sense checking through alternate calculations is encouraged (the longest individual ETD should be the same as the total time it takes to deliver all passengers).

Another common blind spot is when candidates prioritise elevator selection by minimising individual ETD rather than considering the average ETD of all the passengers.

Strong candidates will also utilise shortcuts when conducting calculations – leveraging the fact that every customer who boards the elevator will spend 5s getting on and 5s getting off, which if there are no overlaps, then the total travel time will be equal to # passengers x 10s + travel distance (which depending on the number of directional changes, will usually just be the time it takes for the elevator to go from ground to the top destination and back).

Overall, 'The Elevator Problem' is less so a consulting case, rather a mental exercise. A fun further point of interest and curiosity that you might want to consider is: at what level should the elevators rest in their neutral state if there are no passengers with active destination requests?

Case #17

Feeling Bullish

Difficulty

Outcomes Tested:

- Arbitrage
- Profitability
- Mathematics

Industry:

Fast Food

Case #17 – Feeling Bullish

Brief

Your client is the Chief Marketing Officer (CMO) of Starving Shen's, a global fast-food chain specialising in American-style burgers. As an avid gambler and basketball fan, the CMO has a new idea for a marketing campaign involving his favourite basketball team: the Chicago Bulls. The idea is to offer refunds to all burgers sold during the NBA finals if the Chicago Bulls win. However, with the rest of the board having smaller risk appetites, they aren't convinced this is a good idea, and would rather run a generic marketing campaign as they always have. They have hired you Mc(Insert Candidate Name) and Company to provide a recommendation around which marketing campaign to run.

Clarifying Information

- *No specific KPI or goal*
- *The Chicago Bulls have successfully made it to the finals*

Exemplar Framework

- *Financial – How does this decision impact our bottom line?*
  - *Incremental expected profit*
- *Non-financial – How does this decision impact our business overall?*
  - *Public image – Gambling*
  - *Customer affinity with basketball*
  - *Internal conflict*
- *Mitigations – Are there any strategies we can do to mitigate any risks?*
  - *Hedging opportunities?*

Q1 – Expected Profitability

The client is interested in what the incremental expected profit will be for the campaign. What information would you like to know?

Provide following information when asked:

- Burgers are priced on average at $10 each
- Burgers cost $5 to make
- Sales volume is expected to drive an incremental 1,000 burgers sold if the new campaign is launched
- Sales volume is expected to drive an incremental 500 burgers sold if the generic campaign is launched
- Unfortunately, the Chicago Bull's star player Michael Jordan is in retirement, so their likelihood of winning the NBA final is 20%

Answers

- *Margin per burger is $5 - ($10 selling price - $5 cost to make)*
- *At volumes of 1,000, the expected profit if the Bull lose is $5,000 and if they win the cost is $5,000*
- *Expected profit will be 80% x $5,000 – 20% x $5,000 = $3,000*
- *When compared to the base case of $5 x 500 = $2,500, their expected profit is $500 higher, meaning they should consider this campaign*

Q2 – Risks

What are the risks associated with such a campaign?

Potential Answers

- *Company (external)*
  - *Perceived as potentially promoting gambling*
- *Company (internal)*
  - *Still a risk that they lose, which might make investors / board unhappy*
- *Customer*
  - *Customers who support the other team might dislike Starving Shen's*
  - *Will need to differentiate between the people who would have bought a burger regardless of the campaign*

Q3 – Mitigations

The board is still skeptical and worried that despite the low probability, the Chicago Bulls win the NBA final. Are there any ways to limit or negate the financial risk if the Bulls win?

Potential Answers

- *Create an arbitrage opportunity by betting on the outcome of the match*
- *Add clauses to the campaign – i.e. burgers must come from a meal*
- *Add red tape to the redemption – Customers need to download the app / receive credits*
- *Include a deal if the other team wins*

Q4 – Arbitrage Betting

If the betting odds payout 7 to 1 if the Bulls win, is there an arbitrage opportunity that will guarantee profit for Starving Shen's regardless of the outcome? If so, how much should they bet?

Answers

- *Since the payout odds are greater than 1, and there is "guaranteed" profit if the Bulls lose, there is an arbitrage opportunity, so the candidate should move straight to calculating the optimal betting size*
- *The optimal arbitrage opportunity occurs when the profit from either outcome is the same. Therefore, letting X be the bet amount, the arbitrage opportunity occurs when:*

$$7X - \$5{,}000 = \$5{,}000 - X$$

- *Which when solving for X, produces:*

$$8X = \$10{,}000$$
$$X = \$1{,}250$$

- *A bet of $1,250 will provide a guaranteed profit of $3,750 regardless of the outcome*

Q5 – Maximising Expected Profit

Despite satisfying the concerns of the board, the risk appetite of the CMO is still unsatisfied. What bet size will maximise the expected profit from this campaign, whilst having no financial risk if the Bulls win?

Answers

- *The ideal outcome for the CMO is when the expected profit is maximised.*
- *Letting X be the betting amount, the formula for the expected profit of this outcome:*

$$\textit{Expected profit} = 20\% \times (7X - \$5{,}000) + 80\% \times (\$5{,}000 - X)$$

- *When rearranged this produces:*

$$\textit{Expected Profit} = 3/5 \times X + \$3{,}000$$

- *Therefore, due to the linear equation, the expected profit is maximised as X goes to infinity. (Higher X = higher expected profit)*
- *However, the point at which the financial risk is nil is when the bet size is at $5,000 (outcome of net zero if the Bull lose). Therefore, the optimal betting size is $5,000, which produces an expected profit of $6,000.*

Synthesis

You head over to your local Starving Shen's franchise to reward yourself after a long project, where you see the CMO standing at the front waiting for their order. You approach them and find out they are running late to a board meeting and want to know your recommendation regarding the marketing campaign. In the time it takes for them to receive their order, what will you tell them?

Potential Answer

- Proceed with the marketing campaign but bet on the outcome to offset the losses
- With a bet of $1,250 Starving Shen's guarantees a $3,750 profit, while a bet of $5,000 produces the highest risk-free expected profit of $6,000

Commentary

‘Feeling Bullish’ is another one of my favourite cases. It was inspired by a BCG online assessment case and based on a real business case study of a furniture company.

The crux of this case is working out the approach to the calculations once the betting odds have been introduced. Candidates who simplify their calculations and think logically are more likely to work out the mathematical approach to optimising the betting value.

Candidates who have a background in finance or trading are often able to grasp the concept of expected returns and arbitrage a lot faster which helps streamline calculations. Candidates are encouraged to take their time and break down the problem into simplified and logical steps, asking the interviewer for guidance where necessary.

Most candidates aren’t able to produce the idea of betting on the outcome of the match to offset risk. The blind spot that often leads to this is not considering the question ”What are some ways we can profit/generate a return in the case that the Chicago Bulls wins?”, and instead focusing on the minimisation of losses rather than a full offset.

‘Feeling Bullish’ is the example I use to explain casing to non-casers, and the case that encapsulates the interesting possibilities of business strategy around us. Shoutout to Jess for the cute name!

Case #18

A Second-hand Car

Difficulty

Outcomes Tested:

- Market Sizing

Industry:

Automotives

Case #18 – A Second-hand Car

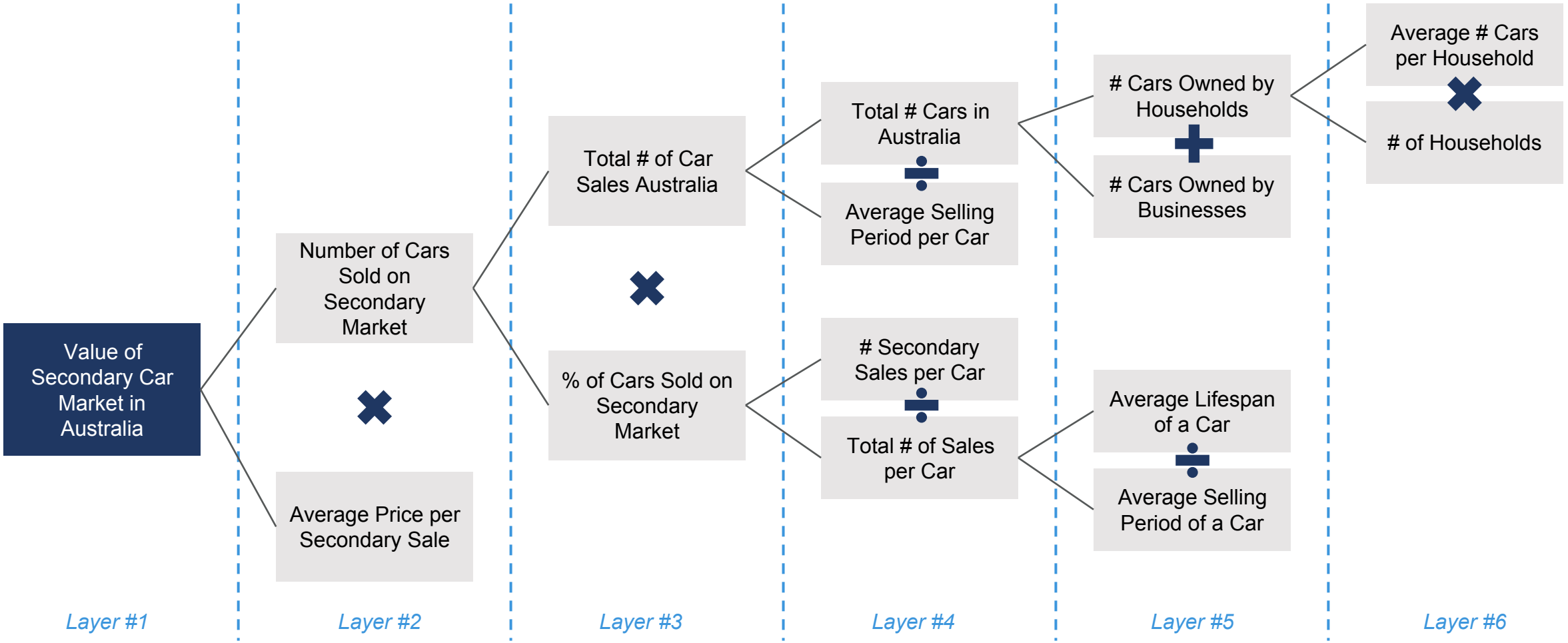
Brief

Please help me estimate the value of the secondary car market in Australia.

Clarifying Information

- *Value in revenue generated within a year*
- *Consider both B2C and C2C sales*
- *Secondary markets refer to any subsequent sales after the initial sale*
- *Population of Australia can be assumed to be 25m*

Potential Answers: High Level Framework



Potential Answers – Walkthrough Numbers

- Layer 6 – Total # of Car Sales in Australia
  - Average # Cars per Household (1.5)
    - Can be more granular, but given six layers deep, this is an inefficient use of time so make a simple assumption that factors in households with 0 cars
  - # of Households (10M)
    - Australia Population (25M) / Average People per Household (2.5)
  - Note: Not the most granular, but already 6 layers deep so keep it simple for time efficiency
- Layer 5 – Total # of Car Sales in Australia
  - Total # Cars Owned by Households (15M)
    - Total Households (10M) x Average Cars per Household (1.5)
  - Total # Owned by Businesses (5M)
    - Assume 25% of cars in Australia are owned by businesses
- Layer 3 – Total # of Car Sales in Australia
  - Total # of Cars in Australia (20M)
    - # Cars Owned by Households (15M) + # Cars Owned by Businesses (5M)
  - Average Selling Period of a Car (4 Years)
- Layer 3 – Total # of Car Sales in Australia
  - Total # of Car Sales in Australia (5M)
    - Total # of Cars in Australia (20M) / Average Selling Period of a Car (4 years)

Potential Answers – Walkthrough Numbers

- Layer 5 – % Cars Sold on Secondary Market
  - Average Lifespan of a Car (20 Years)
    - Can be more granular, but given five layers deep, inefficient use of time so make a simple assumption
  - Average Selling Period of a Car (4 Years)
    - Can be more granular, but given five layers deep, inefficient use of time so make a simple assumption
- Layer 4 – % Cars Sold on Secondary Market
  - # Secondary Sales per Car (4)
    - Total # of Sales per Car (5) – # Sales on Primary Market (1)
  - Total # of Sales per Car (5)
    - Lifespan of a Car (20 years) / Average Selling Period of a Car (4) years
- Layer 3 – % Cars Sold on Secondary Market
  - % Cars Sold on Secondary Market (80%)
    - Total # Secondary Sales per Car (4) / Total # Car Sales per Car (5)
- Layer 2 – Value of Secondary Car Market
  - # Cars Sold on Secondary Market (4M)
    - Total # of Cars Sold in Australia (5M) x % Cars Sold on Secondary Market (80%)
  - Average Price per Secondary Sale ($15K)
    - Assume Average Sale/Value of Car ($30K), assuming straight line depreciation, the average selling point would be at the halfway point (/2)

Potential Answers – Walkthrough Numbers

- Layer 1 – Value of Secondary Car Market ($60Bn)
  - Total # of Secondary Car Sales (4M) x Average Price per Secondary Sale ($15K)
- Therefore, the total value of the secondary car market in Australia in yearly revenue is $60Bn

Commentary

‘A Second-hand Car’ is a market size inspired by a BCG final round case. The secondary-market market size is an interesting one as goods are sold before their end of life. Furthermore, with cars, there are several reasons why consumers purchase or sell cars, which makes it hard to do a demand-side market size.

What makes this market size so difficult is the lack of flexibility around the approach to solving it. While there may be other ways to market size the secondary market, I personally haven’t come across any other convincing ways that don’t have any drawbacks or inaccuracies.

The crux of this market size is utilising a form of the replacement rate, using a selling period rather than the lifetime of a good. Then, recognizing that all subsequent sales after the first will be on the secondary market. Strong candidates will realise they can use the proportion of secondary sales to total sales for a single car as a representative ratio for the entire car population. Using a straight-line depreciation method for pricing the cars sold is another trick that can be used in other similar market sizes.

Another difficulty around this market size is the lack of a final reference number that can help sense check the final figure. It is however possible to use a quick and dirty division by # of households to contextualise “how much the average household spends on a secondhand car every single year”, and scale by the average selling period.

Overall ‘A Second-hand Car’ is a niche market size that hopefully won’t pop up in any of your future interviews, but once you understand the approach it is quite replicable across all secondary markets.

Case #19

A Speedy Delivery

Difficulty

Outcomes Tested:

- Mathematics
- Shortest Route

Industry:

Food Delivery

Case #19 – A Speedy Delivery

Brief

Your client is the Chief Sustainability officer at Uber. In Uber's pursuit to hit net zero emissions, they are looking for ways to reduce their environmental impact, specifically within their UberEats division. They have come to you Mc(Insert Candidate Name) and Company asking for help in brainstorming some strategies to do so.

Clarifying Information

- *No specific target or given timeframe*
- *UberEats is a food delivery platform that uses a last-mile delivery system to deliver food to households, typically using motorbikes or cars.*

Exemplar Framework

- *Direct Impact (Scope 1)*
  - *Deliveries*
    - *Switching to more fuel-efficient travel such as EV, bikes, low-emission cars, hybrids, drones*
    - *Drive more efficient routes that produce fewer emissions* (candidate needs to produce this idea)
    - *Decrease delivery distances by leveraging ghost/centralised kitchens or reducing delivery range*
    - *Increase capacity to deliver multiple meals at once*
  - *Packaging*
    - *Use packaging made from recycled materials*
  - *Networks/operations*
    - *Power online servers, networks or offices using renewable energy*
- *Indirect Impact (Scope 3)*
  - *Restaurant Operations*
    - *Encourage sustainable energy usage, refrigeration, and waste practices*
  - *User Behaviour*
    - *Discouraging single-item ordering and encouraging group orders*
- *Offsets/Partnerships*
  - *Engage in offsetting programs or companies*

Q1A – Route Optimisation

The client is interested in the impact route optimisation may have on CO2 emissions. What are some factors that may affect the level of CO2 emissions from taking one route over another?

Potential Answers

- *Distance travelled*
- *Uphill elevation*
- *Frequency of starting/stopping*
- *Level of traffic*
- *Variance in speed limits (level of acceleration)*
- *Road conditions*

Q1B – Route Optimisation

The client wants to understand the level of CO2 emissions they could reduce if they started optimising routes according to CO2 emissions instead of the speed of delivery. They have produced a typical exemplar scenario for your analysis.

Provide candidate with Exhibit #1

How many kilograms of CO2 can UberEats save if they were to optimise their routes based on CO2 emissions?

Answer Overview

- *To solve this problem, candidates need to solve through a series of steps:*
  - *A) Determine the current path optimised by the speed of delivery*
  - *B) Determine CO2 emissions of that current path*
  - *C) Determine a new path optimised by CO2 emissions*
  - *D) Determine CO2 emissions of the new path*
  - *E) Compare answers from B) and D)*

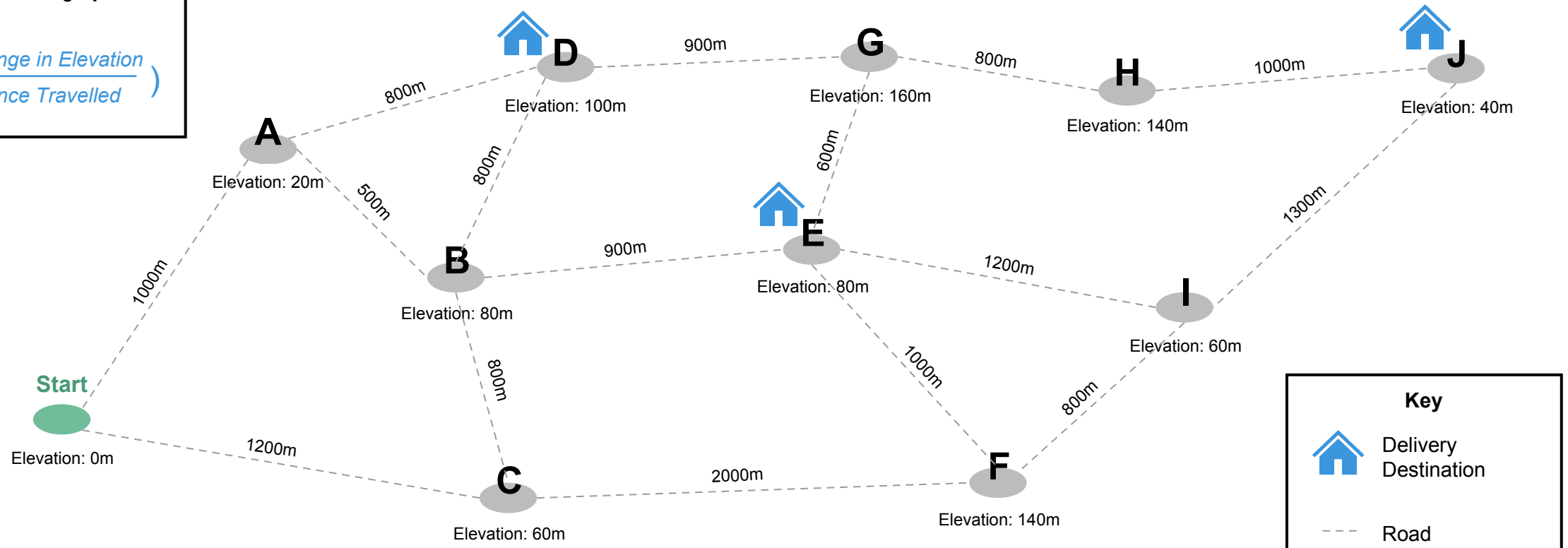
Exhibit #1 – Example Delivery Scenario

Fuel Efficiency:

0.25 grams of CO_2/m

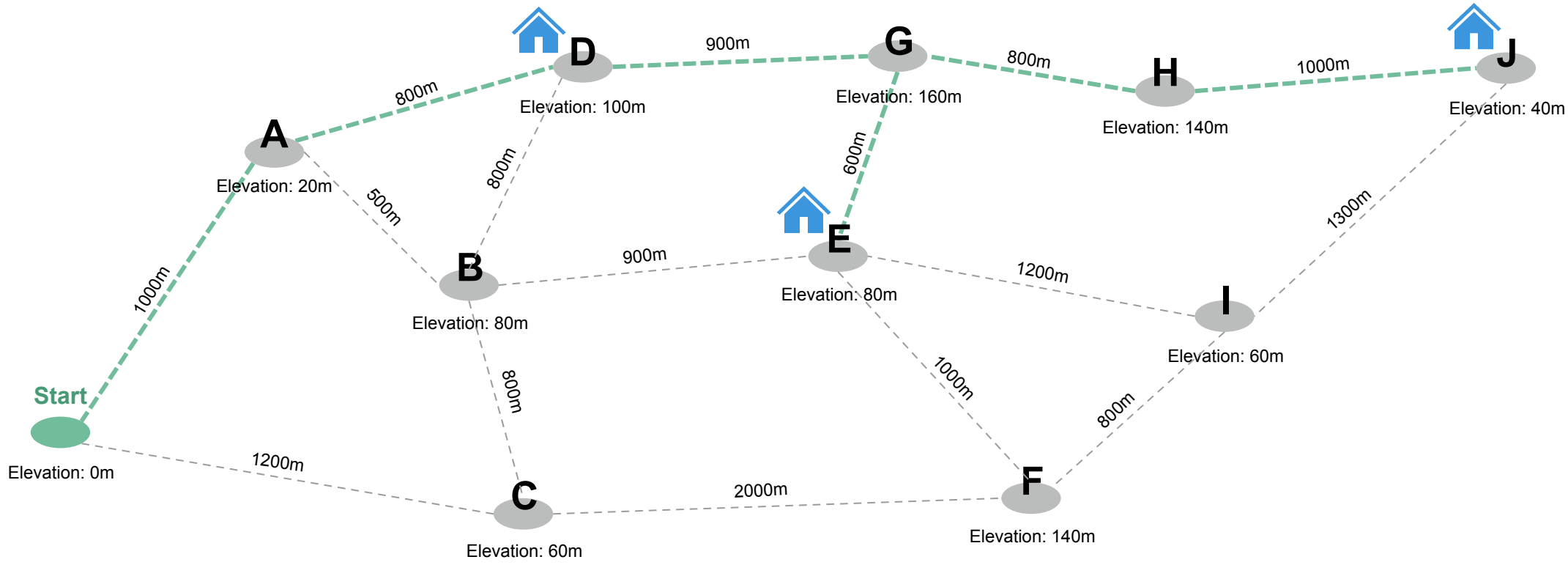
Increases when driving **uphill** by a factor of:

$$\left(1 + \frac{5 \times \text{Change in Elevation}}{\text{Distance Travelled}}\right)$$



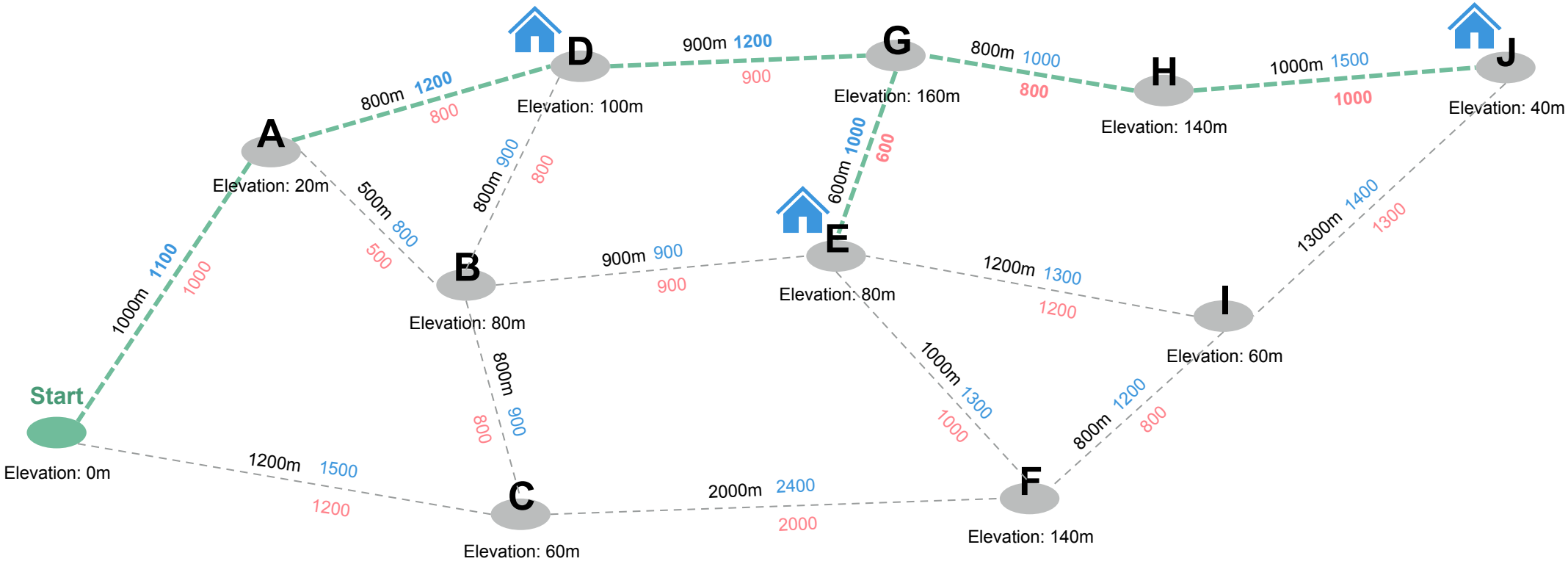
Answer A

- *Current path can be determined by working backwards from J > the next nearest delivery destination > the final delivery destination > the start*
- *The optimal route by speed is SADGEGHJ (highlighted in green)*
- *The length of this route is 5.7km*



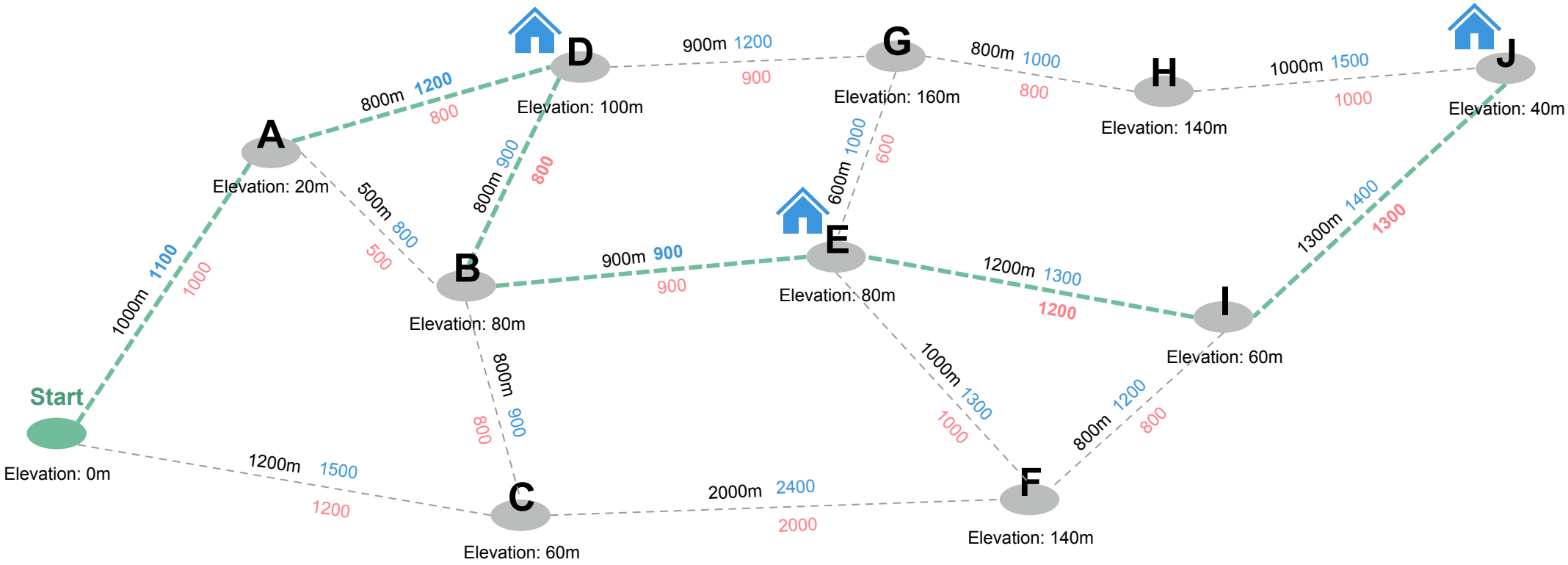
Answer B

- *To calculate CO2 emissions, candidates should recode the distances to reflect the CO2 emissions of travelling in either direction (blue signifying uphill, red downhill)*
- *Simplifying the formula for uphill emissions gives: Total CO2 = 0.25g CO2 x (Distance travelled + 5 x change in elevation)*
- *Leaving the multiplication of 0.25g CO2 to the end streamlines calculations, and makes further analysis easier*
- *Total CO2 of current path = 0.25g CO2 x 6900m*
- *Total CO2 = 1725 grams = 1.725kg*



Answer C

- *To determine optimal path by CO2, candidate can take similar approach of starting from J > next nearest delivery destination by emissions > final destination > start*
- *The optimal path is SADBEIJ (highlighted green and bolded)*

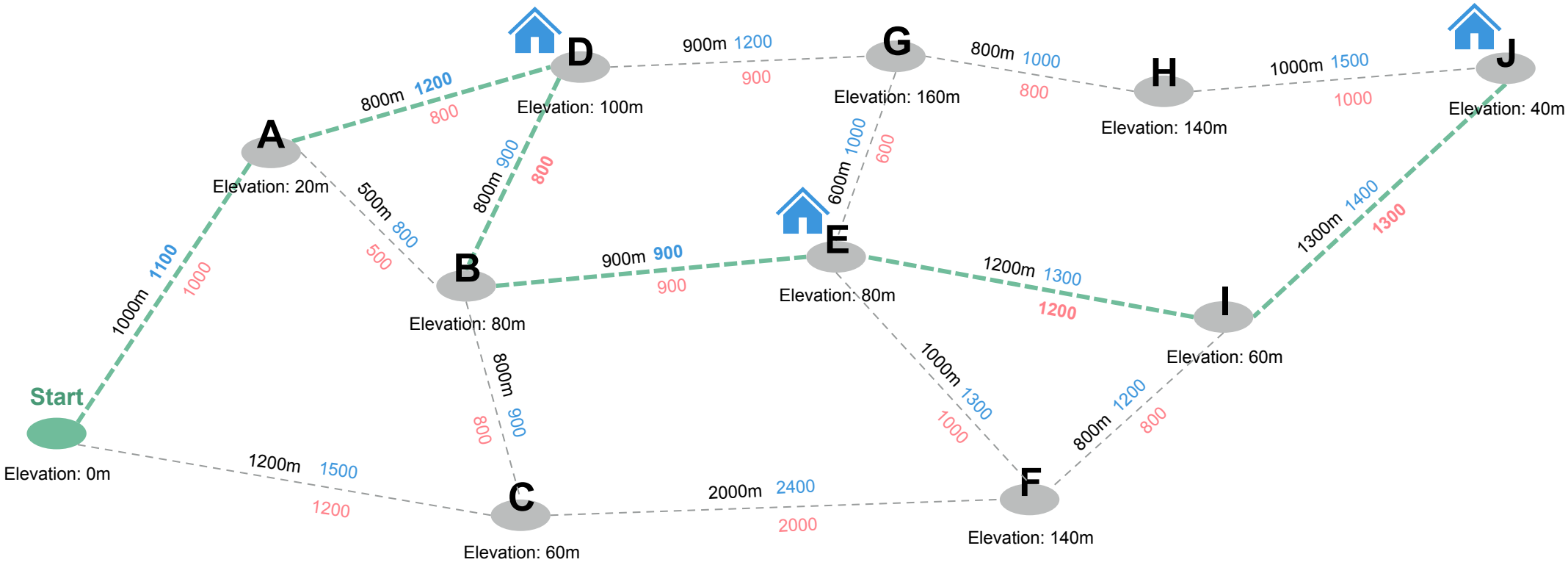


Answer D

- *The total emissions of this route is: 1625gs of CO2 (0.25g CO2 x 6500m)*

Answer E

- *The optimal route by CO2 emissions reduces 0.1kg of CO2, which is approximately 5.8%*



Q2 – Drawbacks of Optimisation

The client is excited about the prospects of this new strategy, however, wants to understand the potential risks or drawbacks of implementing this new optimisation. What do you see as the main risks or drawbacks of optimising routes based on CO2 emissions?

Potential Answers

- *Customer*
  - *Increased delivery time*
- *Driver*
  - *Opportunity cost of potential time spent delivering more orders*
- *UberEats*
  - *Increased operational complexity which may require more resources or technical capabilities*
  - *Reduced number of deliveries that can be delivered within a given timeframe*
  - *Negative public perception of greenwashing given a smaller impact*
- *Environment*
  - *Overall small impact in the grand scheme of potential strategies*

Q3 – Increased Delivery Time

The client is slightly worried about the increased delivery time of each order. How much longer would a customer expect to wait on average for their order?

Assume that the driver averages a speed of 50km/hour and spends a minute at each destination to drop off the customer's food.

Answers

- *Average delivery time per order (old): 3.28 minutes (Total delivery time / # of orders)*
  - *Total Delivery time: 9.84 minutes*
    - *5700m / 50,000m x 60 minutes + 3 x 1 minute = 9.84 minutes*
  - *Total # of Orders: 3*
- *Average delivery time per order (new): 3.4 minutes (Total delivery time / # of orders)*
  - *Total Delivery time: 10.2 minutes*
    - *6000m / 50,000m x 60 minutes + 3 x 1 minute = 10.2 minutes*
  - *Total # of Orders: 3*
- *There will be an average increase in the delivery time by 0.12 minutes, which even when scaled up is barely noticeable to the consumer*

Synthesis

After completing your project, you order some McDonald's (Maccas) on UberEats to the office as your reward meal. You follow the progress of your meal on the app, noticing that it was just picked up by the UberEats driver. Suddenly the door bursts open, and you see your senior manager running late to a board meeting with the client. They ask you for a summary of your recommendation for the client. In the time it takes for your food to arrive, please provide a summary of your recommendation.

Potential Answer

- *Optimise delivery routes based on CO2 emissions rather than speed of delivery*
  - *This has the potential to reduce CO2 emissions by approximately 5.8% per delivery*
  - *This is only at the cost of a 0.12 minute delay in the order time, which is insignificant*

Commentary

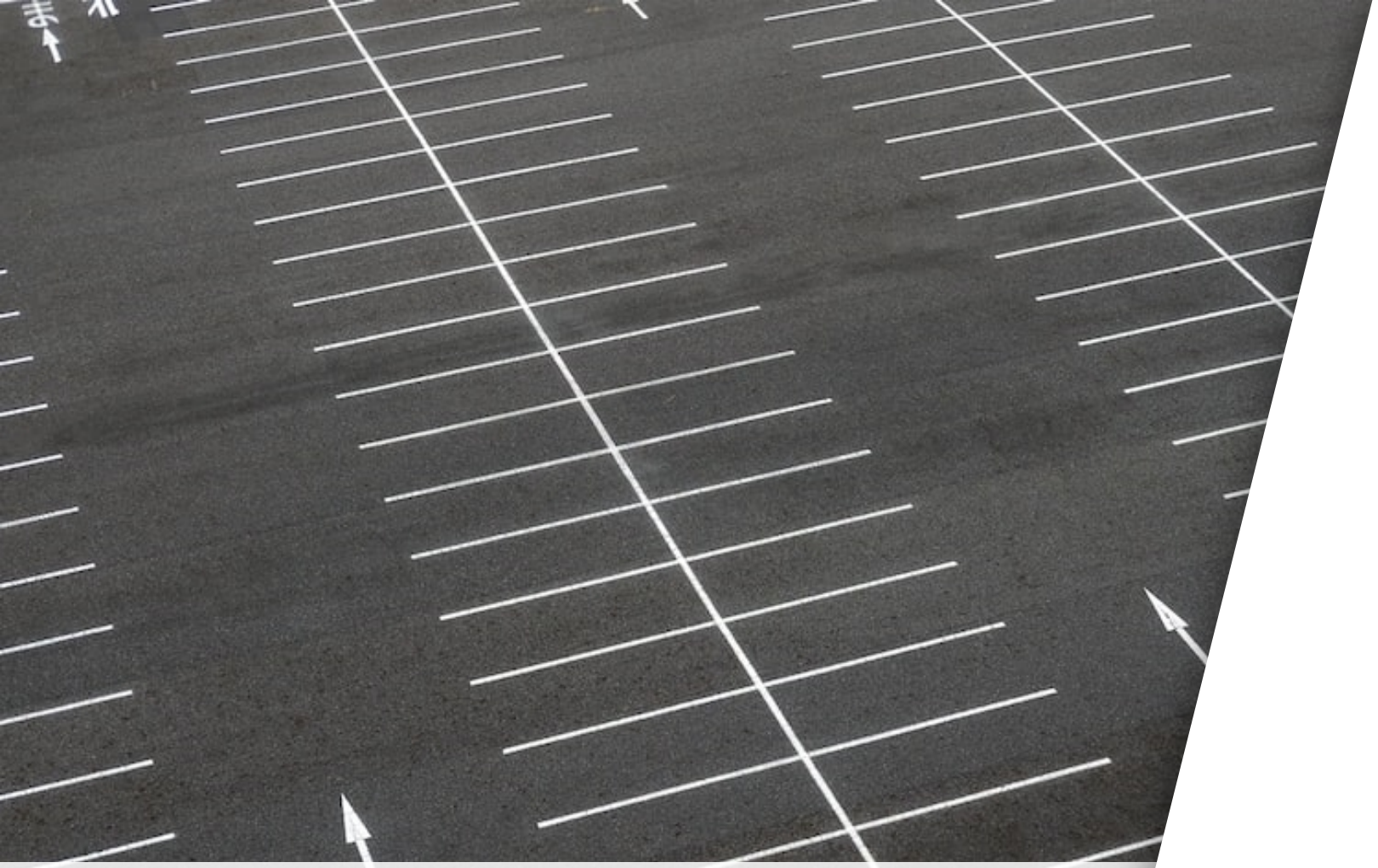
‘A Speedy Delivery’ was inspired by Google Maps’ new feature to recommend the most eco-friendly route over the fastest route. It explores this concept in the context of a delivery driver who has multiple destinations to reach, combining a common concept in coding known as the shortest route problem.

The crux of the case lies in the volume of mathematical calculations that are required in a step-by-step process to derive the key insight from the exhibit. Strong candidates will map out their approach from the beginning, and work through each part stage by stage.

There are several shortcuts that can streamline the calculations. These include comparing the two routes incrementally, delaying the conversion to CO2, and simplifying the elevation multiplier formula.

A common blind spot candidates have in enviro cases is Scope 3 emissions, which are important to consider as many businesses are now being held responsible for managing their Scope 3 emissions.

Overall, ‘A Speedy Delivery’ is a fun adaption of the shortest route problem with adjustments made to the values depending on the direction of travel.



Case #20

Finding Parking

Difficulty

Outcomes Tested:

- Pricing
- Logic Reasoning
- Mathematics
- Structured Thinking

Industry:

Consumer Services

Case #20 – Finding Parking

Brief

Your client is an owner of a commercial parking lot located in the CBD (central business district). They are looking for ways to increase profit and need your help in brainstorming some ways to do so.

Clarifying Information

- *It is just a normal parking lot (nothing special)*
- *Above ground parking lot, multistorey*
- *100 spots*
- *Open 24/7 but charges between 9am and 7pm*
- *Not too much information currently on utilisation, but it is usually pretty busy (how busy the parking lot is)*
- *No context / issues around profitability in the past*
- *No need to consider competitors in the area (other parking lots, free street parking, public transport etc)*
- *No set geography*
- *No specific target for profit*
- *Only way they generate revenue is through charging for parking*

Exemplar Framework (Strong candidate would identify that the bigger opportunity is in the revenue side)

Increase Revenue

- *Increase payment per car*
  - *Increase price per pricing tier*
  - *Reduce cannibalisation of different pricing tiers*
    - *Shorten/adjust pricing tiers*
    - *Remove low-cost options*
  - *Sell additional services – Car wash / valet*
  - *Obscure pricing structures – Mislead customers into paying for longer*
- *Increase number of cars parking (utilisation/demand)*
  - *Sell permanent spots – GoGet / express pickup / business / subscription model*
  - *Remove low use spots – disability / pram / loading zones*
  - *Marketing – Offer special discounts or incentives to park*
- *Increase capacity of parking lot (supply)*
  - *Open/charge for longer*
  - *Repaint lines to fit in more cars*
  - *Build more layers with more spots*

Decrease Costs

- *Fixed*
  - *Rent/land – restructure parking lot higher to reduce psm rent cost*
  - *Negotiate better rates*
  - *Optimise insurance costs*
- *Variable*
  - *Maintenance – switch providers*
  - *Reduce revenue loss - cars exiting without paying*

Q1 – Pricing Optimisation

The client is interested in increasing their revenue by optimising their pricing structure and has conducted an analysis of the varying levels of demand at each price point.

Provide candidate with Exhibit #1

[If candidate is advanced, ask the following question and skip to Q4 after an answer is produced]
What price should the client charge for each parking option to maximise revenue?

[If candidate is intermediate, ask the following question, and continue to Q2 after an answer is produced]
What information needs to be calculated to help determine the ideal price point for each parking option to maximise revenue?

Answers (Candidate needs all of these to progress)

- *Total capacity of the parking lot*
- *Total revenue per option*
- *Revenue per hour (needs to be maximised)*
- *Total parking hours consumed*

Exhibit #1 – Analysis of different price points and expected demand

Capacity of Parking Lot – 100 car spaces

Timing – Paid parking from 9am – 7pm

P2 (2 Hour Parking)			
Price	$8	$10 (Current)	$12
Daily Demand (# Cars)	200	180	150

P4 (4 Hour Parking)			
Price	$12	$13 (Current)	$14
Daily Demand (# Cars)	120	100	90

All Day Parking			
Price	$20	$25 (Current)	$30
Daily Demand (# Cars)	55	34	15

Case #20 – Finding Parking

Answers (Suggested calculations needed to progress)

P2 (2 Hour Parking)			
Price	$8	$10 (Current)	$12
Daily Demand (# Cars)	200	180	150
Revenue	$1,600	$1,800	$1,800
Revenue per Hour	$4	$5	$6
Parking Hours Consumed	400	360	300

P4 (4 Hour Parking)			
Price	$12	$13 (Current)	$14
Daily Demand (# Cars)	120	100	90
Revenue	$1,440	$1,300	$1,260
Revenue per Hour	$3	$3.25	$3.5
Parking Hours Consumed	480	400	360

All Day Parking			
Price	$20	$25 (Current)	$30
Daily Demand (# Cars)	55	34	15
Revenue	$1,100	$850	$450
Revenue per Hour	$2	$2.5	$3
Parking Hours Consumed	550	340	150

Q2A – P2 Determination

Which parking option would the client most prefer most cars to pay for?

Answer

- *The P2, as it has the highest revenue per hour, so the client should begin by focusing on that option*

Q2B – P2 Determination

Of the three P2 options, which one is most attractive for the client?

Answer

- *$12 is the most ideal because it has the highest total revenue, and consumes fewer parking hours, which makes it a better use of resources*

Q3 – P4 Determination

Which pricing tier for P4 is most attractive?

Answer

- *$14 because:*
  - *It is not possible to charge $12 as it would be the same as P2, meaning no one will pay for P2 when they can get P4 for the same price*
  - *Out of $13 and $14, while $13 produces a higher overall revenue, it is at the cost of 40 additional parking hours, which at a rate of $1 per parking hour, is not ideal given capacity constraints*

Q4 – All Day Parking Determination

Which pricing tier for all day parking is most attractive?

Answer

- *$25 because:*
  - *It rounds out the capacity perfectly – Charging $30 will result in under-utilisation, while charging $20 will result in excess demand and an undersupply of parking hours*

Q5 – Total Revenue

What is the total revenue from this pricing structure? How does this compare to the current pricing structure?

Answer

- *The new pricing structure will result in $3,910 per day ($1,800 + $1,260 + $850)*
- *When compared to the current of $3,950 it may seem lower, BUT at the current price point, the parking lot has an excess demand of 100 parking hours, which at an opportunity cost ranging from $2.5 per parking hour to $5 per parking hour means that the actual revenue per day ranges from $3,450 to $3,700*

Synthesis

After finishing your project, you drive down to the parking lot to see your hard work. The parking lot is quite full, and you start circling the parking lot looking for spots. You suddenly get a phone call from the client who asks for a summary of the case. In the time it takes for you to find a parking spot, summarise the case to the client.

Potential Answer

- *Change the pricing structure of the parking lot to $12 for P2, $14 for P4, and $25 for all day*
  - *This will contribute to incremental revenue ranging from $210 to $460 per day*
  - *Reduces the cannibalisation of low-cost parking options*

Commentary

‘Finding Parking’ is one of my proudest and favourite cases of mine. The process of writing this case was just as difficult as solving it. This case offers two ways to be presented, one significantly easier than the other. An approach can be to deliver this case in “hard mode” and help guide candidates forward when they get stuck.

This case reveals a new perspective on considering revenue maximisation for a business model that capitalises off a fixed asset with relatively similar ongoing costs. This new revised revenue formula can be expressed as price x capacity x utilisation. This case explores the relationship between price and capacity and the effects of cannibalisation. As a result, this case lends itself to several blind spots, including cannibalisation, the need to consider capacity, and revenue per parking hour.

Once the candidate has all the necessary information, working through the sections is a logical and fun process, which makes the derivation of the necessary KPIs the crux of this case. Furthermore, candidates can struggle with pricing the impact of cannibalisation, which involves producing a range of values given certain probabilities and outcomes.

In brainstorming, candidates must generate a hypothesis or link ideas to either demand-side or supply-side issues. If the demand was already capped (in this case it was), then all strategies that involve selling out permanent spots will cannibalise the parking lot’s existing sales, resulting in lower overall revenue.

Overall, ‘Finding Parking’ is a fun brain teaser, and my personal favourite to end this casebook on. As a full-circle moment, this new approach to expressing revenue is applicable in the first case of this book ‘Ride the Wave’.

Contact Me!

I love meeting new people and discussing new exciting ideas, so if you would like to contact me feel free to use any of the channels below:

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