ACE THE CASE  
(Free Online Teaser)

A comprehensive guide, full of expert advice and pages of example case based questions, including worked solutions taken from real life management consulting job interviews all over the world
Ace The Case is a highly effective tool in preparing yourself to meet your potential future employer. The diversity of the cases gives you enough scope and depth into the methods needed for almost every interview and will, together with training of numerical skills help you utilise your potential to the full

*R. Lundsgard, Denmark*

When I got invited to an interview with a leading business consulting firm I searched the Internet to see what kind of information is out there about the firm recruiting process. I was quite surprised to find that there is a book made for people in my situation.

I was very satisfied with the form and content of Ace The Case. It is full of relevant information about the case interview system, sample case studies and lots of relevant “pointers” to additional reading materials. Bottom line – If you are about to take such an interview buying ‘Ace The Case’ is a very smart decision.

*B. Glass, Israel*
ACE THE CASE
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Introduction

This 2013 edition of the Ace The Case interview guide was created to help you, the aspiring management consultant, understand and prepare for the challenging rounds of case interviews that lie ahead as you attempt to launch your career in the competitive but rewarding field of management consulting. This guide combines our team’s personal case interview experiences from when we were in your shoes several years ago, with what we now look for when we interview candidates to join our firms. It also includes many more consulting interview questions that have been given to individuals across the globe in real-life job interviews at some of the top consulting firms in the world including McKinsey, Booz & Company, Bain, Boston Consulting Group, A.T. Kearney, and L.E.K Consulting to name just a few. The worked solutions in this guide combine the actual answers given by candidates at the time of interview as well as constructed answers, additions and recommendations made by the expert team here at AceTheCase.com

Unlike other information available on consulting case interviews, this guide and our website take on much more of a global perspective, making it useful to individuals of all nations, not just the United States. Many of the questions have been sourced from Europe, Australia, the United Kingdom, the Middle East and India. Some US based case interview questions in this guide have been reworded to help maintain this publication's uniquely global perspective.

The case interview questions you will inevitably be asked in management consulting job interviews are generally drawn from and related to the country where the interview is taking place. However, our combined experiences with the consulting interview process show that questions based on global markets and organisations operating in foreign countries are not uncommon. Having a reasonable understanding of different countries, demographics, and economies will therefore be an advantage to you. Remember, case interview questions are often just a small taste of the international business scene you will experience once you score the management consulting job of your dreams.

Before reading any further, it’s important to mention that by purchasing and reading this guide, you are not guaranteed interview success or a place at a prestigious consulting firm. By learning the skills required to answer case-based interview questions and through practice, you can improve your chances of interview success. We all hope you will gain something from taking the time to read this guide. You should at a minimum, obtain valuable insight into the art of confidently tackling different types of case questions in the rounds of management consulting interviews that lie ahead. Good Luck!
What is a Case Interview?

A case interview is a unique type of job interview question and a technique used predominantly by management consulting firms to better screen candidates, by assessing their analytical skills in a pressured real-time environment. The case interview question is generally either a business problem, estimating exercise, arithmetic or logic problem designed to make you think on your toes, use reason and common sense. Consulting firms want to see that you can analyse information, structure an answer and perform basic calculations with large numbers, whilst under pressure. The pressure being that you are in a job interview at a top global firm most likely seeking a role you’ve worked hard towards.

The objective of the case interview is not to get it right. In fact, there is often no right answer. Instead it’s designed for you to demonstrate your ability to solve complex problems and to show the interviewer how you think. The interviewer wants to see you as a colleague with whom he or she would want to work with in an engagement team. Case interviews are generally very interactive as you ask questions, seek clarification, and bounce ideas off your interviewer.

The case interview is usually one-on-one and you would be given a pen and paper, or perhaps a marker and whiteboard, where you can brainstorm, perform calculations, and structure your answer. Some consulting firms will even take your notes after the interview has concluded to help them further assess and discuss the performance of candidates with colleagues.

After some light conversation and “getting to know you” type questions, the interviewer will pose the case question. You may want to start taking notes because a lot of information will be coming your way. Clarify all of the details to ensure you have a common understanding and are on the right track before diving into the case. The interviewer will then step back to watch you think it over but is there to answer any questions, give additional information when needed and guide you through the problem.

You can expect to be interviewed by one to three different people on any one day with around 30 minutes to an hour assigned for each interview. A case question itself can last anywhere from 20 - 40 minutes of that time depending on its difficulty and the specific round of interview, or entry level to the firm.

Although you may feel tense, nervous and anxious during a case interview, the important thing is to relax, be confident, and have fun with it.
Answering Case Interview Questions

In this introductory section, we will first offer you some basic advice for answering a case interview question before moving into more detailed sections on case interview skills and finally the many example case questions which you are no doubt keen to sink your teeth into.

When answering case interview questions, the most important thing above all else is to demonstrate to the interviewer your intellect and ability to solve problems. Essentially, that is what a management consultant does. They help solve complex business problems that their clients cannot easily solve themselves.

There is a real chance that during a case interview you will not end up generating a final answer nor will it be anywhere near correct, however don’t be concerned if this happens to you. Case interviews can sometimes end up being an exploration of issues, with the interviewer guiding you down one of many possible paths, allowing you to formulate a solution to a problem, give recommendations, or simply ‘ball park’ an estimate.

With this in mind don’t rush your analysis, as you may overlook important elements to the problem and have too narrow a focus. Still work at a steady pace however, to ensure you can at least give a final answer if required by the interviewer.

Interact with the interviewer and ask lots of questions to gauge the scope of the problem or fill in missing pieces of the puzzle. Certain details of the case and critical information will often be intentionally withheld to see if you can determine by yourself what extra information or data would be useful to help solve the problem. This will help demonstrate how inquisitive and thorough you are in your analysis.

Don’t be afraid to be creative because management consulting requires a large element of ‘thinking outside the box’, i.e. coming up with innovative ideas. Be enthusiastic, confident, and comfortable. Always let your personality come through. You may get way off track in a case interview and think that there is no way you will make it to the next round, however your personality, attitude and enthusiasm can often be what gets you over the line.
A good point to make early in this guide is the importance of bringing structure to your problem solving when analysing and answering case interview questions. Using a simple step-by-step problem solving method such as below may help:

1. Understand and summarise the case question
2. Determine and clarify the case question objective
3. Pull together existing information, ask for and gather more information
4. Analyse this information
5. Group similar issues together and layout a structure
6. Perform calculations or design solutions for issues
7. Formulate and present answer/s

Common business frameworks and other strategic problem solving methods such as Porters 5 forces, the BCG Matrix, SWOT Analysis, Revenue and Cost modelling, Business Life Cycle Analysis, Process Analysis, Mind Mapping, Key Issues Grouping or Problem Decomposition, and Reverse Engineering are often useful tools and can also be great ways of bringing structure to your thoughts, provided you use the right one for the problem. Never try to force a framework or methodology onto a problem. Only use one if there is a natural fit to the case question. Structure your solution in any way you can, keeping in mind what feels appropriate given the nature of the question. Within this guide some of these methods and frameworks are used and briefly discussed in relation to specific case questions, however feel free to research some of them further by yourself or with a classmate, colleague or friend.

A simple way of executing a case analysis is a simple and common method of breaking the problem into distinct segments to create a structured logic map. It is highly visual and you will see this method used several times throughout this guide as we strongly recommend it as a problem solving technique. Try to make your problem components ‘MECE’ i.e. Mutually Exclusive - with no overlapping logical concepts and Collectively Exhaustive - considering as many high level issues as possible with no gaps. From here you can work top-down using a tree-based structure to set up your analysis. Be confident in your analysis and be sure to stick to your logic map once it is created. However, be open to changing direction if you are guided to do so by the interviewer. An example is shown on the next page.
Sample Problem – Automobile Dealership

An automobile dealership is experiencing declining profits. What could be the reason for this?

The diagram below shows the structure of a simple logic map, which can form the starting point for which you could begin your analysis of the question and further discussion with the interviewer.

Sample Logic Map – Automobile Dealership

A simple MECE based hierarchical structure such as this will allow you to dive into different lines of thought with the interviewer as to why the dealership is seeing a declining profit trend. By taking the time at the start of the case analysis to get a visual breakdown onto paper (or a whiteboard), you can more easily probe and ask further questions under each category, then move onto new avenues for consideration when you hit a dead end without forgetting what it was you wanted to explore in the first place.

Why is profitability declining?

- Revenues
  - Price
    - ...
    - ...
  - Volume
    - ...
    - ...

- Costs
  - Fixed
    - ...
    - ...
  - Variable
    - ...
    - ...
    - ...

The last point that should be made in relation to answering case interview questions is in regard to the appearance of your key strengths. Consulting firms hire from a variety of backgrounds and university degrees including engineering, science, law, business, finance, accounting, economics, management, business administration and commerce. They take anyone who shows the right attitude and intellect for the job. Management consulting firms look for the most intelligent individuals who are also ‘all-rounders’ with competencies and interests in a range of disciplines. It’s therefore important, that if you are a business or commerce oriented individual, you must be sure to demonstrate creativity, problem solving skills, and a level of thinking outside of the traditional number crunching financial analyst, economist or accountant mindset. Conversely someone like a scientist of engineer needs to demonstrate a level of business acumen with at least some knowledge or interest in the commercial drivers of the finance world.

Play to your strengths but do not show the interviewer that you are one dimensional and only strong in solving problems from one particular approach, or based on one educational style. In saying all of this, number and math skills are a must, so make sure you can add, subtract, multiply, and divide large numbers in your head or on paper without the use of a calculator.
Structure of This Guide

This guide is divided into six sections. The first section covers some specific skills and tips in relation to case interviews. The next four cover example case questions from real life consulting interviews. These have been categorised into four common question types that you may encounter in any of your interview rounds. The sixth section finishes by providing some interview narratives recorded from real life case interviews, transcribed and summarised to demonstrate how the interaction with the interviewer can play out (both good and bad) and how the general conversation might flow during your case interview.

Section 1: Case Interview Skills
Section 2: Example Market Sizing / Estimating Cases
Section 3: Example Business Problems & Strategy Cases
Section 4: Example Logic Problem Cases
Section 5: Example Data & Chart Based Cases
Section 6: Sample Candidate Case Interview Narratives

Using This Guide

Depending on when you purchased this guide, it is suggested that for maximum benefit, you first attempt answering some of the questions in this guide yourself before looking at our workings and possible solution. Use pen and paper only (no calculator) to mimic the real life interview. Once completed, refer to the worked solutions provided to see how you did, what ideas you missed, what you did better, and where you can improve. After this, attempt some of the extra questions at the end of each section by yourself or with a friend.

Remember, just because your answer does not match the solution or recommendations we provide, it doesn’t mean you are wrong. Firstly, we may be wrong, so feel free to write in and tell us your thoughts. Second and more important is that case questions can be answered in a number of ways and often there are several issues that can be considered and explored, of which we could not attempt to cover all. Our worked solutions serve only as guide and are based on actual answers given by candidates in real life interviews. Your solutions may be even better!
Maintaining Neat and Organised Notes

If possible, use two separate sheets of paper in the interview. Use one for writing down all the data and information you are given as well as any analysis, issue grouping, logic maps, etc. Use the other sheet for your mathematical calculations. Turn them on their side (to landscape) as we have found that this is much easier for working through problems on paper. Depending on the type of case question you are given, you could even summarise into how you structure your thoughts. McKinsey is a firm who has been known to do this.
Mathematical Calculation Advice

You will first need to become comfortable using educated guesses and estimates for values where concrete data is not provided. E.g. the population of the USA is roughly 300 million, UK 60 million, Canada 30 million, Australia 20 million, India 1 billion, Japan 125 million etc.

E.g. the average number of people per household in most western countries is roughly 2.5

E.g. the life expectancy of most countries is around 80 years.

These are all essentially variables in your problems, so as long as they are not wildly farfetched and you can justify your chosen values and explain where more accurate data could be obtained, then you should be alright. Remember, when modelling data and doing calculations, inputs and variables can always be changed later and the answer recalculated. No one expects you to turn up with an encyclopaedic mind. However, a decent worldly general knowledge and explaining the difference between say an African Elephant and an Indian Elephant without consulting the internet via your iPhone is probably expected (Note: African Elephants have much bigger ears!)

The next point is to round large numbers to make calculations much easier. As mentioned earlier, you generally do not get to use a calculator nor should you ever reach for your Smart Phone. This becomes easiest when you get to pick the number yourself. E.g., the average price for a glass of beer across all of Australia may be something like $4.18 AUD, but it makes a lot more sense just to say it is $4.00 and go from there. Your calculations will be a lot simpler as a result and you will still get a feel for the correct quantum of your answer. This is generally more important than its exact accuracy anyway, since you cannot really hope to achieve any real level of accuracy in a pressured job interview setting.

Feel free to ‘ballpark’ calculations and estimates if possible. Ballparking is derived from the game of baseball and is slang for the approximate proper range of something. E.g. “Your estimate is high, but still in the ballpark”. During your calculations you may have to find 24.33% of 617,800 (which equals 150,310.74 if you’re interested) but it’s easier to just ballpark this calculation by working out say 25% of 600,000 = 150,000. Remember it is not a university exam and you do not have a calculator or an Excel spreadsheet handy, so your mathematical responses are not expected to be exact since there is usually some allowable margin of error. Take advantage of the ‘ballpark’ whenever it seems sensible to do so.

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Don't try to do every calculation in your head unless you are sure you can solve them correctly. When doing calculations in your head, be sure to write your solutions down so you can refer to them later. If you remember how to do long division and multiplication of large numbers from your high school days then use these methods, however remember they can be slow. So if you have rounded the larger numbers as we advise, these methods will probably be quick enough or even unnecessary.

The rule of 10’s and ½’s is an extremely useful method of calculation and one well suited to the case interview environment. Basically you break difficult numbers into either tens or halves to do quicker calculations.

E.g. If calculating 37% of 45,000:

- First take 45,000/10 = 4,500, this is 10% of 45,000
- Then halve that to get 4,500/2 = 2,250, this is 5% of 45,000
- Now halve again to get 2,250/2 = 1,125, this 2.5% of 45,000
- Or you can divide the original 10% to get 4,500/10 = 450, this is 1% of 45,000

From the above calculations, you can approximate the answer to:

- (3 x 4,500) + 2,250 + 1,125 = 16,875 = 37.5% of 45,000
- Or more accurately calculate it exactly as:

- (3 x 4,500) + 2,250 + (2 x 450) = 16,650 = 37% of 45,000
The following bullets are a very brief set of key business concepts which we believe you may find useful when attempting case interviews at management consulting firms. Depending on your background, education and experience, some of this should be familiar to you already and you should research each concept yourself that is not at least intuitive to you.

- **Profit** is all revenues less all costs. Revenues are a function of price and quantity. Costs can be broken down into fixed or variable. Costs can also be considered as direct or indirect. Beware of Operating Expenditure vs. Capital Expenditure as the accounting treatment is different.

- When discussing Sales & Marketing options for a company consider the 4 P's: Product, Price, Place (distribution alternatives) and Promotion.

- A Supply Chain is activity and information flow for a product. It will consist of suppliers, manufacturers, distributors, sellers, and finally customers. It applies equally to physical goods as well as intangible goods and service industries.

- Economies of Scale refers to the fact that often the more of something that is produced or purchased the cheaper it is to make or buy.

- Price is affected by supply and demand. High demand and low supply equals higher prices.

- Long Term Contracts can affect business decisions. They can be beneficial (e.g., if a lower price is achieved for raw materials) or obstructive (e.g., if a binding contract prohibits you from getting out of what has become a financially detrimental initiative).

- When discussing and analysing Industry Attractiveness consider the size of the market in dollars, the number of competitors, the minimum efficient scale, and market conditions (growing, stagnant or shrinking).

- When discussing and analysing Mergers and Acquisitions consider such things as whether it will be profitable, financing the acquisition, break even time, product line synergies, market reaction, and cultural issues.

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When discussing and analysing Product Introduction, consider such things as, the potential market and whether customers want or need it. Consider profitability of the product including price, revenues and costs of introduction to the market. Think about the competitor reaction. Can they copy it or do they already have competing products. Also think about whether the new product makes sense for the company and its current portfolio of product lines.

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Market Sizing / Estimating Cases

Case interview questions based on market sizing and estimation are designed to assess your ability to quickly derive rough estimates or 'ball park' figures based on a combination of assumptions, variables, existing knowledge, common sense, and sound reasoning. They also test your confidence with numbers and mathematical capacity to perform quick calculations.

Generally no calculator is given and you must work out the problems on paper, a whiteboard, or in your head. It is practically impossible to get the 'right answer' in this style of case interview question so your goal here instead, should be to cover a significant amount of issues and discuss important variables and assumptions which would affect your answer. Always justify any numbers or figures that you use. Explain where you got a number from or where you could go to source a more accurate percentage, statistic or data point. Don’t be afraid to involve the interviewer asking for their thoughts and input on any assumptions you make. They may have withheld information from you, and will provide it, if and when prompted. This is much like the real-life relationship between consultant and client.

The concept of 'triangulation' coined from the mathematical discipline of trigonometry where the location of a point can be determined by measuring angles to it from other known points is also very important in these types of case questions. If you can estimate an answer using more than one model/method and then compare and maybe even average the two answers then your final solution will probably be more accurate than going with the first that you calculated. Time will however dictate whether you can use this strategy during the case interview. Using more than one approach will also demonstrate open-mindedness because you recognize that there is more than one way to solve a problem.

Performing a reality check on your final answer is always a necessary step demonstrating your capacity for common sense answers. If you end up with an answer that shows for example that in the United States each citizen must be drinking/consuming 10 bottles of coca cola per day then clearly you made some unrealistic assumption or incorrect calculation back through your answer. Voice this and then try to determine where you may have gone wrong which will demonstrate your capacity for self-reflection and critical review.

As mentioned earlier in this guide, it is important to structure your solutions and this cannot be stressed enough. Management consulting firms are looking for calm collected individuals with sound reasoning and logic. The ability to create and follow methodologies, models, and frameworks is a key skill within the consulting industry. By structuring your answer, not only...
When asked a market sizing or estimation type question, seek clarification and be sure to

- Complete your calculations and arrive at a final figure

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2. In units sold

- Start with the estimate for total lipstick consumers (as determined earlier)
- Make a guess at the amount of lipstick that an average consumer uses in a given month
- Multiply the above two numbers to estimate the tubes of lipstick sold each month in the U.S.

\[ \text{Annual volume of lipstick sold} = \text{Monthly estimate} \times 12 \]

3. In revenue

- Start with the annual number of lipsticks sold (as determined earlier)
- Make an assumption of the average price of a tube of lipstick

\[ \text{Annual revenue} = \text{Annual tubes of lipstick sold} \times \text{Avg. price} \]

4. In profits

Method #1: Use the annual revenue estimate and apply a guessed profit margin

\[ \text{Total annual profit} = \text{Annual revenue} \times \text{Profit margin} \]

Method #2: Use the average price, apply a guessed profit margin, and multiply by the estimate annual tubes sold

\[ \text{Unit profit} = \text{Average price} \times \text{Profit margin} \]

\[ \text{Total annual profit} = \text{Unit profit} \times \text{Annual tubes sold} \]

The answers from these two methods could form the basis of some ‘triangulation’ and averaging the two answers to derive your final answer.
We hope from this simple lipstick market sizing example that you now see how important it is to understand your case interview question and what type of answer you are trying to come up with. As we have mentioned earlier, be sure to explain the approach you will take to the interviewer. When writing, use diagrams, clearly space out text and any calculations, link objects, words, and numbers with lines and arrows. Because like we said before, some considers only simple and obvious variables. The amount of time for the case question will vary depending on the length of the interview. Half-hour interviews generally mean 20 minutes assigned to the case question and one hour interviews mean 40 minutes, the longer the interview the larger and more difficult the problems. When you think about it, you actually have lots of time to plan, structure, and calculate a good answer. If you feel the need to go fast then try the technique of triangulation as mentioned earlier to solve the problem from two different approaches. Going slower means you can discuss key variables used in your calculations with the interviewer, like debating over the percentage of females under the age of 25 in the UK that smoke, as opposed to just making a wild guess. Remember, using your time well also demonstrates good time management skills, which is yet another key skill of a management consultant.
Problem – Light Bulbs in Australia

Estimate the market for light bulbs in Australia

This is a very general question without much up-front detail, so you would first need to seek some clarification from the interviewer. Questions you should ask may be: Are you to look at all market segments? (e.g., Business/Commercial, Domestic and Public Lighting). Are you looking at all types of globes or just a few styles? (E.g. Fluorescent and Conventional Incandescent bulbs). Are you calculating the market in terms of units or dollars? Are you looking at the market for one year of sales? After asking some questions you may have narrowed the problem down to only being concerned with:

- Household (Domestic) lighting only
- Traditional incandescent bulbs i.e. Simple Edison screw and Bayonet styles

Possible Solution – Light Bulbs in Australia

Knowing the specifics of the problem, we can now work out how to answer it. First, you would want to brainstorm what variables and factors need to be considered. Involve the interviewer, bounce ideas off them, if possible, and note that this initial list is by no means exhaustive and can be improved upon later. This process alone may take several minutes.

Types of demand for light bulbs:

- Replacement Demand (i.e. in existing homes to replace globes that have blown/died)
- New Demand (i.e. from new housing)

Some initial size related variables:

- Homes in Australia
- Rooms per home
- Globes per room
- Average lifespan of globe
- Average price of globe

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You would want to start off with replacement demand because it is probably larger than new demand. Looking at the variables, we now need to work out how to estimate each one.

If you don’t already know, Australia has roughly 20 million people, your interviewer would probably give you this to start with, unless, of course, you live in Australia, because then you should know the population of your own country. It is a westernised country and so probably has some similarities in terms of culture, housing, and economics to countries like the US, UK, Canada, etc. Using this and considering the mix of large families, small families, singles, elderly, split families, second homes, etc., you can make an educated guess and say there is probably on average 3 people per household. This is a nice simple figure and you should point out to the interviewer that it is also probably the most critical and influential assumption so far.

This then makes $20,000,000 / 3 = 6.7$ million households. From here you should then think about how many rooms a typical house has. Consider large homes, small homes, apartments, etc. Think about houses you’ve been in, like your own, friends’, extended family etc. However, don’t get too caught up on your own personal experiences as you may not be from a ‘typical’ or average household. You may be very wealthy and live in a large home or live in a small dorm room or studio apartment which is at the other end of the scale. Always think about the average or norm.

Again using the concept that Australia has a western culture, 2-3 bedrooms, a kitchen, lounge room, 2 bathrooms, 1.5 car spaces, another room, a hallway, and maybe a staircase, can probably be considered to be pretty normal. This makes roughly 11 rooms or really spaces where lights may be found. You can round it to 10 for simplicity in your calculations.

Thinking about the number of lights in a room or space it is usually about 1 or 2. So taking 1.5 as the average and multiplying it by 10 rooms and you have 15 globes per household.

If you also want to consider any outside lighting and lamps you should probably throw in another 5 globes. That makes an average of 20 globes per household. This is a nice rounded figure to work with.

Now you must think about the average life of a globe. Anywhere from 6 months to 2 years is the norm depending on usage. You can base this on personal life experience. Take 1.5 years and you have each household going through about $20 / 1.5 = 13.3$ globes per year.
Possible Solution – Light Bulbs in Australia (Continued)

Time now for a quick reality check. This 13.3 globes per year number means about one globe in each household dies per month, or conversely one globe is purchased per household per month. This seems somewhat reasonable. On instinct, it may be a little high but we’ll go with it anyway.

Multiplying the 13.3 globes per year by the 6.7 million households, means about 90 million globes are purchased per year in Australia. Since the question asked for market demand as a dollar figure, you must now work out the average cost of a light bulb. Try to think of the price they cost in a supermarket. Explain to the interviewer that if you were to research this in real life you may go and get a sample of prices from a range of different stores in different locations around Australia of different strength and size globes. Consider that buying a 4 pack generally makes each unit cheaper than buying them individually. Also note that if the answer is to be expressed in Australian dollars and you live in the UK for example, then you may need to ask for an exchange rate to help estimate the price. It may of course be acceptable to answer in your local currency.

Globes are generally between 50c – $1 in Australia so take 75c as the average. You can state such a price based again on personal life experience and you may want to consult with the interviewer if this is indeed accurate. Multiplying this through and you have $0.75 x 90 million = $67.5 million Australian dollars ($AUD).

Now at this stage you may want to throw another variable in which was not brought up initially, but has been on your mind since you moved into the calculations. It is an obvious fact that not all households would be using the standard types of globes that are under consideration. Some may have converted to the now common energy saving globes such as compact fluorescents, some would be using fluorescent tubes, others may have fancy down lights or even chandeliers – the list is endless. Households using these different style globes may make up as much as 10% of all homes, and so this fact should be considered by taking 10% off 67.5 million dollars resulting in a revised $60.75 million Australian dollar figure for replacement demand. Let’s round that down to $60 million.

By now you may be running low on time and haven’t even touched on the new demand market as a result of new homes being built. It’s good that at least something has been worked out above and this can form the basis for determining a dollar figure for new demand. Just remember that for calculating new demand, a globe’s useful life is irrelevant because a new home requires every globe to be installed at the same time. It is really just about how many new homes are being built.
data on new housing development or development approvals would give you a more accurate picture of the numbers. For now, find a reasonable percentage figure like 3% (i.e.,

light bulbs within Australia.

$2.7\,\text{million}$

Adding these two figures together gives $62.7\,\text{million}$ Australian dollars as the market for light bulbs within Australia.
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**Australian Light Bulb Market**

- Replacement demand – resulting from existing homes
- New demand – resulting from new homes

6.7 million x 3% = 200,000 new homes

$2.7 million AUD

20 globes per house

13.3 globes per year per household

10 rooms/spaces per house

6.7 million households

New homes = 3% of existing homes per year

200,000 homes x 20 globes x $0.75 AUD x 90%

Population of Australia ~ 20 million with say 3 people per household

2-3 bedrooms, kitchen, lounge room, 2 bathrooms, 1.5 car spaces, another room, hallway, maybe a staircase. This makes ~10.

1.5 globes per room.

Plus extra globes to cover outside, as well as lamps etc.

Lifespan of globe about 1.5 years

6.7 million x 13.3 = 90 million globes

Average cost of light globe = $0.75 = $67.5 million AUD

10% of homes not using the standard bulb globes

$67.5 million x 90% = roughly $60 million AUD

$62.7 million AUD

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Section 2: Market Sizing / Estimating Cases

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Problem – Car Battery Market in India

Estimate how many car batteries are sold each year in India, focusing yourself more on the explanation and justification of your methodology rather than the exact figures and calculations.

By shifting the focus of this estimation based case interview question from the calculations to the methodology, the interviewer will be aiming to gauge your base level of general knowledge, intuitive reasoning and problem solving approach. Because performing calculations is not the focus here, you should try and provide several methodologies rather than get too caught up in running the math as in the previous question.

Explain that if given adequate time and resources, following more than one approach and triangulating a final estimate based on the outcomes of different approaches should yield a more accurate estimate of the market compared to using just one methodology.

Possible Solution – Car Battery Market in India

Assuming the interviewer does not start by giving you any additional guidance on the question, you could kick off by laying down a few different approaches to the problem.

Methodology I) Market Research Driven

Your first method could utilise physical market research by talking to car dealers, battery wholesalers and retailers within India and asking them to divulge the number of batteries they sell in a year (expressed in units) and whether they sell direct to consumers, to mechanics, car dealerships, or all. If they sell to more than one market then attempt to obtain data on their sales mix. Be sure to then eliminate any double counting by making necessary adjustments, since you may be obtaining data from multiple points within the supply chain. Once the number of units per seller is adjusted and cleansed, call this variable N.

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Possible Solution – Car Battery Market in India (Continued)

You would then need to estimate the number of these sellers in India. Make this variable $S$. To do this you’d need the number of sellers in your sample and some associated demographics:

- Taking a rough estimate of their area density (number of sellers per unit area)

- Estimating the number of sellers on a per capita basis. Make this variable $S_2$.

- Estimating the number of sellers per number of cars in the country. Make this variable $S_3$.

Obtain the necessary data on the country of India to calculate the variables $S_1$, $S_2$, and $S_3$:

- Area of India. Make this variable $IA$

- Population of India. Make this variable $IP$

- Number of cars in India. Make this variable $IC$

Now determine the variable $S$ (the number of sellers across India) by averaging the results of the following 3 calculations:

- $S_1 \times IA$
- $S_2 \times IP$
- $S_3 \times IC$

Multiplying Variable $N$ and $S$ should give you a reasonable estimate of the number of car batteries sold in a year in India.

Methodology 2) Assumption driven

A different approach and one more practical for deriving an actual answer within the confines of the interview room, may be to drive your problem solving by making intuitive assumptions which could be cross-checked and improved upon later through further research. You would be expected to come up with at least some of the things needed to derive an estimate for a car battery market on your own. You aren’t expected to have any detailed mechanical knowledge, nor ever owned a car to know these things. Understanding the basics, i.e. all new cars need a battery and car batteries need replacing every few years.

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Assume there are X million new cars sold in India this year and 15X million on the road.

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Assume the average life of a car is say 15 years on average.

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Assume batteries in cars need to be replaced after say 3 years on an average.

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Assume batteries in cars need to be replaced after say 3 years on an average.
On the face of it this is a pretty straight forward case interview question. It was a first round question for a graduate position at a mid-tier consultancy in Canada. Because of its simplicity, exploring different revenue sources beyond just the ticket sales, such as event sponsorship, food & beverage, merchandise, CD sales, VIP seating, after parties etc. is probably the key to demonstrating your ability and business acumen.

**Possible Solution – College Rock Concert**

In order to help you derive an answer that meets the reasonableness test, you would want to first discuss with your interviewer some of the qualitative and quantitative constraints of the problem. This will enable you to better frame certain variables that are required to formulate a sensible revenue potential for the event. For example knowing who will be allowed to attend the concert (Students, Staff, Guests or General Public) will be important. Knowing if the concert is outdoors or indoors and what the seating/standing arrangements are will help to understand capacity. Finally the length of the concert, number of bands in the line-up and the rules around exit and re-entry may be key drivers that need to be understood for calculating secondary revenue sources such as food and beverage sales.

Start off by casually talking to the interviewer about all of these things that enter your mind to see what she’ll divulge and what she’ll leave up to you as assumptions that must be made. When it comes to exploring unknowns and laying down some assumptions, don’t be afraid to discuss and debate them with your interviewer. Also try to come to a mutual agreement on each one to ensure it is reasonable, it will also make you feel more comfortable as you progress with your calculations. 

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Only students and staff with valid identification can attend the concert.
There are 15 rows of 15 seats each, out of which the first 5 rows are reserved for VIPs. Behind and to the sides there is standing room where two thousand people can stand and watch the concert.

The concert will be in the evening and go for 2.5 hrs.
The general admission ticket charges are $40 for sitting and $20 for standing. It is $100 for VIP's as they get access to the backstage area before and after the concert which includes an after party.

There are several sponsors for the concert—a title sponsor, two associate sponsors, four co-sponsors, and two media partners.

The sponsorship amounts are $1,000 for the title sponsor, $600 for the associate sponsors, $400 for the co-sponsors, and $200 for the media partners.

There are 4 food and beverage counters brought in for the concert which sell food items at $5 each and drinks at $5 each.
It is assumed that approximately 500 people will buy two food items and two drinks each during the concert.

There is a merchandise booth situated near the entrance selling $20 shirts and $20 CD's. It is assumed that 10% of the audience would buy one of these items.

The event organizer's commission is 50% of any retailer profits. The retailer's profit margins are 25% across food, beverage, merchandise and CD's.

Now, given these assumptions agreed upon by you and the interviewer, you can start doing the math.
Possible Solution – College Rock Concert (Continued)

Revenue from ticket sales:
\[
(10 \text{ rows} \times 15 \text{ seats} \times \$40/\text{ticket}) + (5 \text{ rows} \times 15 \text{ seats} \times \$100/\text{ticket}) + (2,000 \text{ standing audience} \times \$20/\text{ticket}) \times 80\% = \$42,800
\]

Revenue from sponsorship:
\[
\$1,000 \[\text{title sponsor}\] + \$600 \times 2 \[\text{associate sponsors}\] + \$400 \times 4 \[\text{co-sponsors}\] + \$200 \times 2 \[\text{media partners}\] = \$4,200
\]

Revenue from food & beverage:
\[
500 \times 2 \times \$5 + 500 \times 2 \times \$5 = \$10,000 \text{ sales revenue}
\]

\[
\$10,000 \times 25\% \times 50\% = \$1,250
\]

Revenue from merchandising:
\[
(2,225 \times 80\% = 1,780 \text{ total audience}) \times 10\% \times \$20 = \$3,560 \text{ sales revenue.}
\]

\[
\$3,560 \times 25\% \times 50\% = \$445
\]

Total Revenue:
\[
\$42,800 + \$4,200 + \$1,250 + \$445 = \$48,695
\]

If you were the actual organiser of the concert and you were going through this estimation process, you could tell the key stakeholders (e.g. your university) that the event has a revenue potential for the college of between \$45,000 and \$50,000 depending on attendance levels.

The next steps would of course be to prepare a breakdown of the costs to ensure that the event is first feasible and second worth the time and effort. I.e. if it is forecasted to generate

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Section 2: Market Sizing / Estimating Cases

**Problem** – Automatic Garage Door Motors

Estimate how many automatic garage door motors are sold each year in California, USA.

To understand this question you would again need to seek some clarification from the interviewer. Through questioning you are given more information and it is explained that only the domestic household market is to be considered. Such motors on average have a 10 year life and therefore need replacing after this period of time. The population of California is roughly 36 million and the answer should simply be expressed in units.

**Possible Solution – Automatic Garage Door Motors**

Things you’ll need to consider in answering this question include:

- New demand will result from 2 sources, both new homes and old homes, because some older homes get automatic garage door motors installed on their existing doors. In addition more new homes will have an automatic garage door compared to old homes since automatic garage doors are relatively new technology and sales/installations would increase each year as these become more affordable and popular.
- An item such as an automatic garage door can be considered a luxury and therefore wealthier homes are more likely to have them compared to lower income households.
- Apartments and units can be eliminated from the question because they generally have either no parking or an underground parking area and if it has an automatic door at the entrance it would probably be more of an industrial sized motor and is therefore out of scope for this question.
- In terms of households then, some have two doors for two car spaces, some one big door for two spaces, some have one door for one space, some simply a car port and therefore no door, whilst other large homes can have up to 4 separate garage doors. 1 garage door per home therefore seems like a good average and sensible number to use to answer the case.

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Possible Solution – Automatic Garage Door Motors (Cont’d)

Using these initial ideas, an answer to the case question can then be worked out. A possible solution is presented below with the aid of a rough logic map.

California’s Automatic Garage Door Motor Market

<table>
<thead>
<tr>
<th>California has a 36 million population</th>
</tr>
</thead>
<tbody>
<tr>
<td>A wealthy western culture made up of families, couples, singles, elderly.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>New Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installations in new homes</td>
</tr>
</tbody>
</table>

Using the average 1 garage door per home you get an estimated 485,000 motors per annum.

<table>
<thead>
<tr>
<th>Replacements Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>California has a 36 million population</td>
</tr>
<tr>
<td>A wealthy western culture made up of families, couples, singles, elderly.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>California’s Automatic Garage Door Motor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor has 10 year life span</td>
</tr>
<tr>
<td>Automated garage doors have been in existence for say 15 years, however</td>
</tr>
</tbody>
</table>

| Housing in California may be increasing at a rate of say 2–3% per annum in line with economic inflation, GDP and population growth. This means 12 million x 25% = 300,000 new developments p.a. Of this only 85% even have garages = 255,000. Of this only 25% would even get an automatic garage door = 65,000 eligible homes approximately |

| At a guess, about 3% of existing homes probably upgrade to an automatic garage door each year. So 10 million eligible homes x 3% = 300,000 homes having an installations done each year |

Using the average 1 garage door per home you get 365,000 motors.

<table>
<thead>
<tr>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>365,000</td>
</tr>
<tr>
<td>215,000</td>
</tr>
<tr>
<td>75,000</td>
</tr>
<tr>
<td>15 yrs</td>
</tr>
<tr>
<td>10 yrs</td>
</tr>
<tr>
<td>5 yrs</td>
</tr>
<tr>
<td>Present</td>
</tr>
</tbody>
</table>

These will all need replacing.
Section 2: Market Sizing / Estimating Cases

Problem – Indian Cinema Hall

Estimate the gross revenue of a cinema hall in India for an average week of the year.

India has the largest film industry in the world in terms of the sheer number of ticket sales. The most popular actors and actresses are tremendously famous and treated like heroes. The billion plus population loves to go to cinemas and watch their favourite actors perform in the entertaining Bollywood films which are often filled with music, colour, romance and dance.

The burgeoning middle class (or 'motor class' as it is sometimes known due to the new prevalence of motor vehicle ownership) is comprised of approximately 300 million people predominantly living in the cities, urban areas and surrounding suburbs. Taking all of this basic demographic information into account will greatly help in making sensible estimates and assumptions. Answering this case question should be relatively straightforward. Like other revenue based case questions, you'll impress the interview if you consider more than just one revenue source and perform the necessary calculations on paper or in your head with accuracy and speed. Thinking of key variables that can be 'flexed' to do some sensitivity analysis on your answer, and then researched in greater detail later will also make you stand out as a candidate. A lot of junior consultants spend time performing financial analysis, forecasts and estimates for larger client engagements, so also clearly explaining these concepts as you go should help to improve your chances.

Possible Solution – Indian Cinema Hall

To begin answering this question, ask if you can assume that you will be determining the weekly revenue of a single cinema hall in a busy district. You believe the primary source of revenue would therefore be the ticket sales and movie advertisements. Other sources of revenue will come from food & beverage sales and maybe even parking fees.

Ticket Sales

You could begin by estimating the seating capacity of the cinema hall. Let's assume that there are 20 seats per row and there are 40 rows in all. The maximum number of people it can accommodate is therefore 800 people per show. If you assume the cinema is open 7
### Possible Solution – Indian Cinema Hall (Continued)

Now thinking about this logically, cinemas are never 100% full and during weekdays, people go to work and school so there are significantly lesser film viewers on these days. However, during weekends, lots of people storm the cinema. So let's say the cinema occupancy is at 60% during weekdays and 90% during weekends. The results, multiplied by the price of a ticket, assume 150 Indian Rupees (note: if you are not from India then you'll probably have no real idea of ticket price, so ask your interviewer for some guidance on this, or price against another currency, apply a foreign exchange rate and maybe a divisor if necessary to account for price disparity) would yield us the revenue from the ticket sales per show. The math is illustrated below.

**Weekdays**

- Occupancy: $800 \times 60\% = 480$ moviegoers
- Revenue per show: $480 \times 150 = 72,000$
- Revenue per day: $72,000 \times 4 = 288,000$
- Total week days' revenue: $288,000 \times 5 = Rs. 1,440,000$

**Weekends**

- Occupancy: $800 \times 90\% = 720$ moviegoers
- Revenue per show: $720 \times 150 = 108,000$
- Revenue per day: $108,000 \times 4 = Rs. 432,000$
- Total Weekends' Revenue: $432,000 \times 2 = Rs. 864,000$

**Total Weekly Revenue from Ticket Sales**

$1,440,000 + 864,000 = Rs. 2,304,000$

### Advertising

Now, to determine the revenues from cinema advertisements, we need to have an educated guess on the number of advertising spots per show. Assume the cinema allots eight 30 second advertising spots at the beginning of the show in between any movie trailers for new movies. That would be 240 seconds for each show. For simplicity let’s...
Possible Solution – Indian Cinema Hall (Continued)

That would generate: $8 \times $5,000 = $40,000 per show.

Multiply it by the number of shows in a week, $40,000 \times 28 = $1,120,000.

Food & Beverage

To account for other sources of income, let’s start off with the revenues from the snack counter. Since the cinema hall has its own centre, we can assume that the snack bar is also run by the theatre management. You can peg the cost of snacks at $50 each. Of the hundreds of moviegoers, you can roughly estimate that 50% would buy snacks. Again, using our estimate of the number of people during weekdays and weekends, we can easily calculate the gross revenues from food & beverage as illustrated below:

**Weekdays**

480 people x 4 shows x 5 days x 50% = 4,800 people

4,800 x 50 = $240,000

**Weekends**

720 people x 4 shows x 2 days x 50% = 2,880 people

2,880 x 50 = $144,000

Adding the two figures would give us $384,000

Parking Fees

Like above, because the cinema hall has its own centre, we can assume that the hypothetical parking station is also run by theatre management. Now to work out the revenue from parking, we must consider the fact that people in India use both 2-wheeled and 4-wheeled vehicles. Let us assume that 25% of the moviegoers come via motorbike and 25% come by car. The remainder come by bus, train bicycle or walk. We should also consider that moviegoers will bring companions when they go to the cinema. We could say that on average 1.5 persons come by a two-wheeler and 2.5 in a car.

Parking for two-wheelers would naturally cost less than for four-wheelers. Let us assume that the parking fee for motorcycles is at $10 while the fee for cars is at $20.
The calculation is therefore as follows:

Total number of viewers per week: 9,600 on weekdays and 5,760 on weekends.

Adding this up will give us a total of 15,360 moviegoers.

For motorcycles: \( \frac{15,360 \times 25%}{1.5} = 2,560 \)

\( 2,560 \times \text{Rs. 10} = \text{Rs. 25,600} \)

For cars: \( \frac{15,360 \times 25%}{2.5} = 1,536 \)

\( 1,536 \times \text{Rs. 20} = \text{Rs. 30,720} \)

Adding these two will give us \( \text{Rs. 56,320} \)

Total Gross Revenue

Summing all revenues from ticket sales, advertisements, snack counter and parking fees:

\( = 2,304,000 + 1,120,000 + 384,000 + 56,320 \)

\( = \text{Rs. 3,864,320} \)

\( = \text{approx. Rs. 4,000,000} \) per week.
Problem – UK Beer Market

Estimate the amount of beer consumed per capita in the UK in one year.

With the rise of premixed alcoholic beverages, beer companies are worried that the amount of beer consumed in the UK will steadily decline compared to the 70’s, 80’s and 90’s. This question, at first glance, appears reasonably straightforward if you live in the UK and are a beer drinker because you could probably just think logically about how much you and your friends drink. If you do not fit this description then the question becomes a lot harder. In addition, your analytical skill comes into play when thinking about the term ‘per capita’ and deducing facts about the UK population. The answer is to be expressed in terms of volume and specifically litres (L). You are not given any more information other than the question statement above.

Possible Solution – UK Beer Market

The current population of the UK is approximately 60 million people. If you don’t know this figure then you may be able to ask the interviewer, otherwise, they may instruct you to think about it based on the size and population of the US or even other European nations like France. Parts of the UK are quite multicultural and it has an ageing population like many western nations.

The first thing to do is work out what percentage of the population consume beer. Variables to consider here are religion, age, and gender. The legal drinking age in the UK is 18 so anyone below this age should be eliminated, although underage drinking is a problem.

Many females do not drink beer at all, preferring drinks such as premixed beverages, wine and champagne. In addition, those females that do drink beer tend to consume less than males. Drinking beer is generally a very social activity and a younger person’s leisure. As such, people over the age of say 65 can probably be eliminated from consideration. Certain religions also disapprove of alcohol meaning more people can be eliminated.

Logically thinking about these variables and their associated percentages is what will impress your interviewer rather than pulling them out of thin air. Even if you are wrong, at least you have thought about it logically.

On the next page is a hypothetical diagram you may draw up in the interview, attempting to segment the UK population.

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From this hypothetical population diagram, we have approximately 40 million people within the beer drinking age. Now, in most populations, the male to female ratio is roughly 50/50. There is no reason why the UK would be vastly different so we shall use this ratio. That makes 20 million males and 20 million females in the beer drinking age. It is fair to assume that more men drink than women. However, not all men drink beer. Personal lifestyle choices, substitute forms of alcohol, as well as religion, are the largest probable factors influencing beer consumption in both men and women. For males, non-beer drinkers may account for as much as 15% of the 20 million. Likewise, not all females drink alcohol, and as mentioned, many of those who do drink substitute for wine, champagne, and other pre-mixed or post-mixed drinks such as vodka and orange, Bacardi lemon lime, rum and coke etc. It therefore may be fair to assume that only 20% of all females in the UK drink beer. We then have 20 million x 85% + 20 million x 20% = 21 million beer drinkers in the UK.
Now you must try to determine how much each drinks in a year. If you drink beer yourself or you know someone who does, it will become an easier estimate. What we suggest regardless, is to again segment the market. Create three categories of beer consumption, small, average and heavy beer drinkers.

Based on your knowledge of drinking you can assume that a small beer drinker would on average drink less than 5 beers per week, an average beer drinker 5 to 15 a week, and a heavy beer drinker 15 to 30 a week. Assuming the population of beer drinkers (21 million) is normally distributed between the two extremes (i.e. a bell shaped curve for consumption).

The average across males and females is probably about 10 beers per week.

Now the volume measure of a standard quantity of beer in the UK is the Pint, which is roughly 0.5L or 16 US Fluid Ounces. Bottles and cans of beer are a little smaller, however we shall stick with the 0.5L measurement for simplicity of calculation.

Here then are the final calculations:

\[ 0.5 \text{L} \times 10 \times 52 \text{ weeks} = \text{approximately} 250 \text{L of beer per year for an average beer drinking individual.} \]

\[ 250 \text{L} \times 21 \text{ million} = 5,250 \text{ Million litres of beer consumed in the UK each year} \]

\[ 5,250 \text{ million} / 60 \text{ Million population} = \text{approximately} 90\text{L of beer per capita per year} \]

15 Million litres a day – that’s a whole lot of beer!
Problem – NYC Taxis

Estimate how many taxis there are in New York City

This is another classic management consulting question used across the world. The site of yellow taxi cabs in New York City, and particularly Manhattan, is a famous image worldwide. Estimating just how many taxis are actually there in the city, is of course a challenge, especially if you don’t live in NYC or have never visited there. This question will therefore test your logic and reasoning. It asks for a single unit estimate.

Possible Solution – NYC Taxis

After some initial discussion and questioning, you find out that you need only consider the area of Manhattan. Now, to impress the interviewer, it is best to really break this question down and consider a range of variables. Two methods present themselves as possible ways of answering the problem:

Capacity

Think about the physical layout of the city streets and surrounding areas. Work out how many taxis fit onto the streets, then considering that roughly every second vehicle in NYC is a yellow taxi, make a judgment based on capacity.

Demand

Start with the population of Manhattan, categorize and divide the population and then determine how often citizens get a taxi and how many trips a taxi would do in a standard shift.

We will perform an analysis using both methods so that we can compare the two answers in order to triangulate a more accurate final answer. See the logic maps on the next two pages for the workings of both possible solutions.
Possible Solution – NYC Taxis (Continued)

Method 1: Capacity

By making some assumptions we can determine a maximum capacity figure through understanding how many taxis can actually fit onto the streets.

- **20% Streets**
  - = 5.2 square miles
- **60% Travelled Streets**
  - = 3.12 square miles
- **40% Intersections, street parking, small streets and alleys**
  - = 0.312 square miles
- **10% Vehicles**
  - = 0.15 square miles

To consider taxis being repaired, garaged, out of town etc. add 10%.

- **11,000 taxi’s**

Number of NYC Taxis in Manhattan

Area of Manhattan = 26 square miles

Manhattan is roughly rectangular in shape. 13 miles long and 2 miles wide.

- **80% Blocks, Buildings, Parks, Sidewalks etc.**
- **50% Taxis**
- **50% Other Vehicles**

Think logically about a bird’s eye view of any high density city to come up with some reasonable assumptions.

\[
= \frac{(0.15 \times 27\ 878\ 400)}{375} \approx 11,000\ taxi's
\]
Possible Solution – NYC Taxis (Continued)

Method 2: Demand

By working top-down, starting from the population of Manhattan, we can estimate the demand for taxis if we make enough assumptions.

75% Catch Taxi's = 1.5 million

1/6 Catch taxi's three times per week = 250,000

1/6 Catch taxi's daily = 250,000

1/3 Catch taxi's once per week = 500,000

1/3 Catch taxi's once per month = 500,000

Now, an average taxi ride = say 20 mins

And, over two shifts a single taxi can take maybe 40 rides per day = 280 rides per week

No. Taxi's = 3,125,000 taxi rides per week / 280

Approximately 11,000 Taxis

Number of NYC Taxis in Manhattan

Population of Manhattan = 1.5 + 0.5 = 2 million

Manhattan's population is 1.5 million then add another 500,000 people because of those who commute into Manhattan for work, tourists, business travels etc.

25% Never catch taxis' = 7 x 250,000 + 3 x 250,000 + 1 x 500,000 + ¼ x 500,000 = 3,125,000 taxi rides per week
Triangulating an Answer

As discussed earlier in this guide, approaching an ambiguous problem from multiple directions allows you to sensibly check two or more answers against each other to hopefully find a more accurate middle ground. The concept of triangulation helps to achieve this and can assist in verifying one or more answers to the problem by having an additional basis for comparison.

The concept of triangulation is used in navigation and comes from the world of geometry, in particular trigonometry, in which the distance to an object can be determined by knowing distances and angles of two other reference points, thus forming a triangle. The term is often borrowed by the business world, including management consultants, when solving ambiguous business problems, which require an element of estimation. If more than one technique is used and the estimates align, then a greater level of confidence in your answer can be assumed. However, this concept also works in reverse and if the two estimates are far apart, confidence in both answers is reduced and you’ll probably need to begin revising your assumptions and variables, or worse, start over.

As a real world example, triangulation is often done by investment banks, finance houses and corporate advisory firms during financial valuations of organisations. Whereby a time consuming and detailed discounted cash flow (DCF) valuation model is constructed and compared against a more simplified calculation of enterprise value using a revenue, profit or share price multiple approach or some other consensus valuation methodology.

In this particular problem, looking at both of the methods used above, the answers are very close to one another. You should therefore have a greater degree of confidence that you are on the right track in estimating your final answer. You can be confident in presenting a final answer to the interviewer knowing that the two calculation methodologies resulted in similar answers. Taking a simple average of the two answers results in a final estimate of 11,500 yellow taxis in Manhattan. This seems reasonable and agrees with the two values calculated above. You should now explain to the interviewer in relative confidence your final answer to the problem – “I estimate that there are approximately 11,500 yellow taxi cabs in Manhattan on any one day.”
The Commonwealth Bank of Australia is one of Australia's largest and most popular retail banks with branches all over the country. With the rise in internet banking, ATM's, and cost cutting in the retail banking sector, many banks have consolidated and or closed branches around the country in recent years. You will therefore need to think very logically in estimating how many physical Commonwealth Bank branches actually exist.

**Possible Solution – Bank Branches**

This looks like a pretty difficult and complicated case interview question. It can however be made easier to roughly estimate an answer by using a concept known as 'Critical Mass'.

Critical Mass was first coined in the world of nuclear physics, relating to the amount of fissionable material needed to sustain nuclear chain reactions. Like many things, the terminology has now been applied to the business world. Usually if you want to purchase and setup something like a gym franchise the franchisor company requires that the city, town or area where you want to put the complex has a certain population within a certain area.

For example in the United States, a Gold's Gym franchise requires a minimum of 50,000 people within a 25km radius. This general concept can loosely be applied to many businesses that require foot traffic, including bank branches. Of course, you would expect a bank branch's critical mass to be a lot less than a gym since almost everyone needs to do some form of banking, including businesses. To further prove this concept, there are even statistical comparison reports of nations and how many bank branches they have per million citizens.

To get started you'll first need the population of Australia. If you did not already know it, the population of Australia is about 20 million people.

To work out the critical mass for a retail bank, you'll need to look at a reasonably large, yet familiar area, such as your own city, town, municipality, shire, county, zip code/postcode, or district for which you have a good idea of the resident population and the number of a specific bank's branches.

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business as well as small remote townships.

Now, the area in mind that will be used for this question is an actual region in Sydney, Australia. It has a population of approximately 215,000. There are about 30 suburbs in this region, and after thinking about the number of bank branches of a specific bank, there appears to be about 9 and so we’ll make it 10 for good measure. This means that each bank has a critical mass of on average 21,500 people. This doesn’t mean that this is the number of people that use the bank. This is simply the population that it can potentially draw customers from. Its customers may only be 1/6 of that based on market share and how many competitor banks there are in the area.

Assuming the Commonwealth Bank has a true national presence and is represented equally throughout the country, the next step is to take this critical mass figure of 21,500 and...

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Problem – Bowling Balls in a Jumbo Jet

How many bowling balls could you fit into a jumbo jet?

This is a classic management consulting case interview question. It tests purely your logic and math skills through trying to estimate something that is completely non-realistic, even absurd. The question requires you to think about the dimensions and available volume of a jumbo jet as well as the size of a bowling ball and how they might sit or stack with other bowling balls in a large space. For those not strong in math and calculating volume, the use of π (pi) is needed and without a calculator, calculations can become tricky if you don’t be smart and round off to more simple whole numbers. Despite the introduction of new Airbus A380’s into several airlines around the world, you are told that for the purpose of this question, that a jumbo jet is a Boeing 747 airplane. The bowling balls are to go only in the fuselage where passengers sit. I.e., do not consider things like the fuel tank, wings and cargo hold.

Possible Solution – Bowling Balls in a Jumbo Jet

Aside from working out the size of a Boeing 747 and the volume of a bowling ball the key to impressing the interviewer here, is including other factors which take up volume within the fuselage of the airplane e.g., seats, the galley, and overhead compartments. The other trick is working out how bowling balls stack together.

To start with, let’s think about a Boeing 747 or ‘jumbo jet’. It is longer than an Olympic swimming pool (50m or 163.5 ft.) but less than a football field (usually around 100m or 100 yards). Let’s say it is 70m, which seems about right. Inside this type of airplane, the seating configuration is usually 3-4-3 with two aisles. Each seat is about 0.5m wide and the aisles about the same. This makes the interior of the airplane in question 12 x 0.5 = 6m wide. We’ll stretch it to 7m for good measure.
Since the fuselage is roughly of a tube shape, you get a cylinder as shown below.

The volume of this cylinder in cubic meters is therefore:

\[
\frac{7}{2} \times \pi \times 70 = 12.25 \times 3.14 \times 70 = 2,700 \text{m}^3
\]

approximately

The technical diagram below confirms our dimension assumptions. You can see that the shape of a jumbo jet includes a second level for first class passengers at the nose, and like most airplane designs, it tapers at the tail. Looking side on at the airplane, the addition of the second level practically fills the space that the tapered tail takes away. The basic cylinder volume above can therefore be used as a reasonable assumption for this question.
Now, things like seating, galleys, toilets, structural components, flooring, roofing, cargo hold and cockpit probably take up about 15-20% of the cylinders volume. Taking 20% off this volume figure is probably reasonable from an overall picture. So 80% of 2,700m$^3$ is equal to 2,160m$^3$ and this is the volume we will work with.

We need to now look at the bowling ball side of the question. A bowling ball is a sphere. If you picture one in your head or hold up your hands you should be able to estimate its diameter to be roughly 20cm. In fact they are actually 22cm in diameter so 20cm was a good guess but we'll use the real measurement in the following calculations.

Before we calculate volume, it's important to note something about spheres or balls and the way they sit on top of each other when stacked. You would know from experience, that when a lot of balls are stacked together they take up less space than what you would first assume. Look at the illustration below:

Consideration in this problem. Let's first work out how many bowling balls fit into 1 cubic meter.
Working with simple ratios now, we can therefore say that in a $1\text{m}^3$ volume you can fit 
$(\frac{1}{1.13}) \times 125 = 110$ bowling balls.

volume taken up by the seats was already factored into the total available volume of the cylinder. this disruption of the space available inside the airplane and its impact on the way
To actually demonstrate the concept of triangulation we will try and estimate an answer to the same question through another method.

A jumbo jet holds just over 400 passengers. Ignoring the cargo hold, each passenger has roughly one item of hand luggage on board and combined, usually completely fills all of the overhead compartment space on the airplane. When you sit on an actual airplane seat and look around, the actual human bodies probably only take up about 10% of the available space taking into account the empty space of the aisles and head room. That means you could probably cram and squash 10 people for every one body into the extra space. 10 x 400 = 4,000 people squashed into the passenger hold of a jumbo jet. You now have 4,000 bodies and 400 items of hand luggage. Assuming that each item of hand luggage can hold 5 bowling balls on average and the volume of a human body about 15 – 20 bowling balls depending on size (let’s take the high side and say 20). We have 20 x 4000 + 5 x 400 = 82,000 bowling balls.

You will see that this is far less than the earlier estimate. Depending on your preference, you may wish to propose this figure instead, keep the previous estimate or average the two estimates to get a final answer of about 150,000 bowling balls.

Obviously a 747 jumbo jet has never been filled with bowling balls, as it is a pointless exercise. Whether for the purpose of strategic or creative thinking, the exercise is valid.

Took very highly by management consulting firms because it shows your ability to think outside the square and approach a problem from multiple viewpoints.
This question is both challenging and interesting. It has often been applied to other famous bridges.

Possible Solution – Sydney Harbour Bridge

If you don’t know, the Sydney Harbor Bridge (located in Sydney, Australia) is probably the most famous bridge in the southern hemisphere spanning across one of the world’s most beautiful natural harbors. The first thing you’ll need to do is clarify and further define the question. After some basic discussion with the interviewer, you come to an understanding that in this question, vehicles mean anything traveling on the road such as cars, buses, trucks, bikes, motorbikes, vans, etc. and that you are considering a standard week day.

In answering the actual question by calculating throughput, what we’ll need to do is first work out the length width and usage patterns of the bridge. Here you may try and interact with the interviewer to get some hints on how long it is. You would probably not be given a picture such as that shown above. However, from it and the surrounding office buildings we can see that the bridge is somewhere between 300m and 500m. We’ll therefore take the middle ground and say it is 400m long. In calculating throughput however, the length is not as important as the width. If you lived in Sydney, you would know that the bridge has 8 traffic lanes. It also has a pedestrian footpath and two

trucks, bikes, motorbikes, vans, etc. and that you are considering a standard week day.
You could draw a rough timeline chart to illustrate traffic flow during different time periods. It may look something like this:

From this chart, we can see the assumption that more traffic flows across the bridge during the peak periods (7-10am & 4-7pm), slightly less flows in the middle of the day, even less in the early morning and evening, and less still during the night hours (12-5am). You would base such assumptions on personal experience and a general knowledge of how traffic flows in large cities. Such a chart can be further modified based on any comments made by the interviewer.

You would now need to attempt to quantify the 4 categories of traffic flow from your chart (High, Medium, Low, and Very Low). The city of Sydney is Australia’s largest city with just over 4 million residents and the harbor bridge, despite a toll and new harbor tunnel, is still a primary route for motorists crossing and entering the CBD (Central Business District). From personal experience of driving a car during peak hour, you may estimate that cars are spaced roughly 3 car lengths apart during such time and this is considered heavy traffic. To sense check this, draw a sketch. Heavy traffic on the Sydney harbor bridge may therefore look something like on the illustration on the next page:

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Taking into account all car shapes, trucks, busses, motor bikes, etc., the average length of a vehicle is probably about 6m. This means, that one lane of length 400m has $\frac{400}{6 \times 4} = \frac{400}{24}$ = vehicles at any one second during peak hours. The Sydney Harbor Bridge has a speed limit of 60km/h so this means that in one hour, one lane of traffic during peak hour sees:

$\frac{60}{0.4} \times 17 = 150 \times 17 = 2550$ vehicles pass through it.

This means 4 lanes would have roughly 10,000 vehicles passing through in one hour during peak periods. Since the bridge is used to access the CBD and also cross the city, flow in both directions can be considered, although in reality there is probably some difference. Hence we now have 20,000 vehicles traveling across the bridge in one hour during peak periods.

If you are short in time you may want to estimate the other traffic categories as a percentage of peak flow. E.g. medium traffic could be 25% of this, low traffic 10% and very low 5%. From here all you must do is calculate all of the numbers through for every hour of the day and then add all of the results together. See the table on the next page.
<table>
<thead>
<tr>
<th>Hour</th>
<th>Traffic Level</th>
<th>% of peak</th>
<th>Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1am</td>
<td>Very Low 5%</td>
<td>5% x 20,000 = 1,000</td>
<td></td>
</tr>
<tr>
<td>2am</td>
<td>Very Low 5%</td>
<td>5% x 20,000 = 1,000</td>
<td></td>
</tr>
<tr>
<td>3am</td>
<td>Very Low 5%</td>
<td>5% x 20,000 = 1,000</td>
<td></td>
</tr>
<tr>
<td>4am</td>
<td>Very Low 5%</td>
<td>5% x 20,000 = 1,000</td>
<td></td>
</tr>
<tr>
<td>5am</td>
<td>Low 10%</td>
<td>10% x 20,000 = 2,000</td>
<td></td>
</tr>
<tr>
<td>6am</td>
<td>Medium 25%</td>
<td>25% x 20,000 = 5,000</td>
<td></td>
</tr>
<tr>
<td>7am</td>
<td>High 100%</td>
<td>100% x 20,000 = 20,000</td>
<td></td>
</tr>
<tr>
<td>8am</td>
<td>High 100%</td>
<td>100% x 20,000 = 20,000</td>
<td></td>
</tr>
<tr>
<td>9am</td>
<td>High 100%</td>
<td>100% x 20,000 = 20,000</td>
<td></td>
</tr>
<tr>
<td>10am</td>
<td>High 100%</td>
<td>100% x 20,000 = 20,000</td>
<td></td>
</tr>
<tr>
<td>11am</td>
<td>Medium 25%</td>
<td>25% x 20,000 = 5,000</td>
<td></td>
</tr>
<tr>
<td>12pm</td>
<td>Medium 25%</td>
<td>25% x 20,000 = 5,000</td>
<td></td>
</tr>
<tr>
<td>1pm</td>
<td>Medium 25%</td>
<td>25% x 20,000 = 5,000</td>
<td></td>
</tr>
<tr>
<td>2pm</td>
<td>Medium 25%</td>
<td>25% x 20,000 = 5,000</td>
<td></td>
</tr>
<tr>
<td>3pm</td>
<td>Medium 25%</td>
<td>25% x 20,000 = 5,000</td>
<td></td>
</tr>
<tr>
<td>4pm</td>
<td>Medium 25%</td>
<td>25% x 20,000 = 5,000</td>
<td></td>
</tr>
<tr>
<td>5pm</td>
<td>High 100%</td>
<td>100% x 20,000 = 20,000</td>
<td></td>
</tr>
<tr>
<td>6pm</td>
<td>High 100%</td>
<td>100% x 20,000 = 20,000</td>
<td></td>
</tr>
<tr>
<td>7pm</td>
<td>High 100%</td>
<td>100% x 20,000 = 20,000</td>
<td></td>
</tr>
<tr>
<td>8pm</td>
<td>Medium 25%</td>
<td>25% x 20,000 = 5,000</td>
<td></td>
</tr>
<tr>
<td>9pm</td>
<td>Medium 25%</td>
<td>25% x 20,000 = 5,000</td>
<td></td>
</tr>
<tr>
<td>10pm</td>
<td>Low 10%</td>
<td>10% x 20,000 = 2,000</td>
<td></td>
</tr>
</tbody>
</table>

Total = 196,000

By using the method of calculating throughput per hour, the final answer comes out at 196,000 vehicles crossing the Sydney harbor bridge each day. You'll be interested to know that after working this problem through, the actual answer was looked up on an Australian government website and was found to be just over 160,000 vehicles per day. 196,000 is pretty close and in the right order of magnitude. Remember though, as we have mentioned before, the interviewers are looking at your method, skills, and calculations, not the exact accuracy of your final answer.
Problem – Rubber Tyres

Estimate the number of rubber tyres on the planet right now.

On first inspection this question appears near impossible to get anywhere near an accurate answer as the world is just so large and diverse. The key to impressing the interviewer is therefore thinking out loud and discussing possible variables to the problem. There is so much to discuss that you may not even come out with a final number, so try to stay on track.

After some discussion, you find out a bit more regarding the question. You are to consider tyres for motorised vehicles only (i.e., not bicycles or toys) and further, only whole tyres, i.e., broken tyres are out of scope.

Possible Solution – Rubber Tyres

The first step in such a question may be to brainstorm some variables or things that need to at least be considered. This may take about 5 or so minutes and might involve some interaction with the interviewer. Below is such a list.

- Motorised vehicles and rubber tyres have been around since at least the 1930’s
- Many used tyres go into landfill, others are dumped, abandoned or burned whilst some are recycled
- The world population is over 6 billion. However, only a fraction has the wealth to even own a motorised vehicle.
- New tyres are being produced every year
- New tyres will exist in the inventory of wholesaler and retailer organisations
- Cars actually have 5 tyres because generally speaking they should all carry at least one spare tire.
- The lifespan of a tire ranges from 1 to 3 years
- Motorised vehicles with tyres include private cars, motor bikes, trucks, buses, taxis, courier vans, race cars, airplanes, military vehicles, construction vehicles, trailers etc.

You could spend hours trying to accurately quantify everything above. However, in limited time, you may be best off just creating percentages and whole numbers based on gut feel and intuition, to at least derive and answer to the case question.

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<table>
<thead>
<tr>
<th>Variable</th>
<th>Estimate</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>World Population</td>
<td>6 Billion</td>
<td>Educated guess</td>
</tr>
<tr>
<td>Percentage with wealth to afford vehicles</td>
<td>20%</td>
<td>Poor regions in places such as Africa, India, Asia and South America</td>
</tr>
<tr>
<td>Percentage of these individuals who own vehicles</td>
<td>25%</td>
<td>Think of places like the US, Canada, UK, Europe where about 1 in 4 people own a vehicle. (this may be a little high)</td>
</tr>
<tr>
<td>Comparative Percentage of Business &amp; Government vehicles to private ownership</td>
<td>50%</td>
<td>I.e., for every two private vehicles there is one vehicle owned by industry/government. This includes trucks, taxis, airplanes, buses etc.</td>
</tr>
<tr>
<td>Average number of tyres per vehicle</td>
<td>6</td>
<td>This takes into account the diversity and range between motor bikes, cars, trucks, etc.</td>
</tr>
<tr>
<td>Average life of a tyre</td>
<td>3 years</td>
<td>Based on personal experience of car ownership. Larger vehicles such as trucks may be different.</td>
</tr>
<tr>
<td>Tyre Production each year</td>
<td>Will be 1/3 of what is currently in use</td>
<td></td>
</tr>
<tr>
<td>Percentage kept in inventories</td>
<td>5%</td>
<td>Educated guess – ½ of month</td>
</tr>
<tr>
<td>Tyre Disposal each year</td>
<td>Calc</td>
<td>Will be almost identical to production minus growth factor</td>
</tr>
<tr>
<td>Percentage of tyres into landfill</td>
<td>50%</td>
<td>Realistically, these percentages would have changed over time since the early days of tyres.</td>
</tr>
<tr>
<td>Percentage of tyres recycled</td>
<td>25%</td>
<td></td>
</tr>
<tr>
<td>Percentage of tyres abandoned</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Percentage of tyres destroyed</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>World straight-line growth in vehicles</td>
<td>2.5% pa.</td>
<td>Realistically probably an exponential growth with peaks and troughs along the way</td>
</tr>
</tbody>
</table>

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Tyres currently in use

= \[(6 \text{ billion} \times 20\% \times 25\%) + (6 \text{ billion} \times 20\% \times 25\%) \times 50\%\] \times 6

= [300 \text{ million} + 150 \text{ million}] \times 6

= 450 \text{ million} \times 6 = 2.7 \text{ billion tyres}

Tyres produced this year

= Tyres in use \times \frac{1}{\text{lifespan}}

= 2.7 \text{ billion} \times \frac{1}{3}

= 900 \text{ million}

Tyres currently kept in inventories

= \text{Tyres produced each year} \times 5\%

= 900 \text{ million} \times 5\%

= 45 \text{ Million}

Tyres disposed this year

= \text{tyres produced} - \text{growth factor}

= 900 \text{ million} - 2.5\%

= 877.5 \text{ million}

Tyres into landfill and abandoned this year

= \text{tyres disposed} \times (\text{landfill %} + \text{abandon %})

= 877.5 \text{ million} \times 60\%

= 530 \text{ million} (rounded up)

Using some of these figures and the 2.5% growth rate, we can estimate how many tyres exist out there in the world considering they have existed since say the 1930's. The interviewer may stop you there and tell you not to bother, as by now you have already performed enough calculations and made many useful assumptions. However, if asked, it would look something like this:

\[2.7 \text{ billion} + 900 \text{ million} + 45 \text{ million} + \sum_{i=1}^{80} 530 \text{ million} \times 0.975 + 516 \text{ million} \times 0.975 + 503.1 \text{ million} \times 0.975 \ldots \]

= 22 \text{ Billion}!
Problem – Cigarettes

Estimate the number of cigarettes consumed per day in Canada.

The popularity of tobacco in western nations has marginally declined in recent years due to research results on the links to lung cancer and extensive health warnings. With population growth however, the sale of cigarettes still slightly increases each year in many of these countries. However, Canada has seen a downward trend in cigarette consumption. This question therefore simply asks for a single estimate of unit consumption of cigarettes in one day for the entire nation of Canada.

Possible Solution – Cigarettes

For those who don't know, the population of Canada is just over 30 million. Cigarettes are classified as a fast moving consumer good and therefore huge numbers of them are consumed each day. Regular smokers may go through a pack per day. However, not everyone who smokes consumes this many cigarettes. This question is therefore all about segmenting the population and estimating reasonable percentages. See the logic map on the next page for a possible solution.
Section 2: Market Sizing / Estimating Cases

Possible Solution – Cigarettes (Continued)

20% Smokers = 4.8 million
25% Recreational smokers = 1.2 million
75% Daily smokers = 3.6 million

12.5 Cigarettes per day
0.3 Cigarettes per day

Normal pack has 20 cigarettes. Some people smoke more than a pack a day whilst others smoke less. The average is probably therefore between 10 - 15 per day. Say 12.5 = 12.5 x 3.6 million = 45 million

Again, think about people you know who do smoke and how frequent they smoke to make a guess at this split.

This is harder to estimate since occasional smokers consume anywhere from 1 cigarette per month to 1 per week to 5 per week. Generally these types of smokers only smoke when socialising i.e. at a bar or club. So let's make this average 2 per week = 0.3 per day.

= 0.3 x 1.2 million = 3.6 million

48.6 million cigarettes smoked per day in Canada

Canada's Daily Cigarette Consumption

Potential Smoking Population

24 Million

Population of Canada = 30 million

80% of the population is over the age of 15 which is generally the age people start smoking. 30 x 0.8 = 24.

80% Non-Smokers

Think logically about a representative sample of your friends, relatives, co-workers, classmates, etc. to derive necessary percentage splits.
Problem – Online DVD Rental

XYZ Ltd. is a movie portal website. They rent out DVDs movies all over India. Estimate the annual revenue of this online business.

To be able to calculate the annual revenue for XYZ Ltd. we need to have an idea of the size of the customer base. To understand the customer base in a country like India, it would be good to know the size and quality of the movie database too. Begin by quizzing the interviewer to see where it leads. Upon talking to the interviewer about XYZ Ltd., he divulges 3 key pieces of information:

- The company rents out DVDs in English and other vernacular languages
- Customers are only from the cities, as delivery, pick-up, and drop-off centres exist only in the cities
- There are two methods of transaction:
  1) the customer can send an SMS with the movie details to the number provided by the company for information regarding the availability of any DVD movie
  2) the customer can log in to the company’s website using the username provided to them and can check out the stock to select a movie of their choice

Possible Solution – Online DVD Rental

We can start by calculating the urban population. Assume that 30% of the population live in the cities. After this, we need to find out the number of urban households in India. Assuming an average of 4 persons per household for urban areas, we get 75 million households. If 50% of this is the average internet market for urban areas in India, we can say...
possible solution – online DVD rental (continued)

That roughly 35 million urban households have an internet connection. That’s 35 million urban internet connections, give or take. There is probably only one person per household who has membership to the online DVD rental service. So this gives a potential market of 35 million people.

Now realistically, this service is not yet very popular in India. So, assume it to have a penetration of less than 1% of the population (that’s 1 in 100 people). Depending on the level of advertising done by XYZ Ltd and word of mouth success, it may be as low as 0.5%. Assume it to have maybe a 20% annual growth rate. This gives a nationwide customer base of 1.75 million and 350,000 new customers for the year.

After estimating the probable customer base, we need to find out the revenue generated per customer. We would need the schedule of prices charged to customers and maybe an idea of how frequently customers use the service. The interviewer explains that it is a membership revenue model and hands you some data on pricing:

<table>
<thead>
<tr>
<th>Plan No.</th>
<th>Plan Charges</th>
<th>Plan Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rs. 100 per month</td>
<td>1 DVD per week for a year</td>
</tr>
<tr>
<td>2</td>
<td>Rs. 200 per month</td>
<td>2 DVDs per week for a year</td>
</tr>
<tr>
<td>3</td>
<td>Rs. 300 per month</td>
<td>3 DVDs per week for a year</td>
</tr>
</tbody>
</table>

There’s also a one-time registration fee of Rs. 1,000 for any new customer.

After being told of the membership revenue model you may decide to revise down your assumptions on the customer base, as the annual payment plans would restrict interest in the online service down to avid DVD renters only. Let’s take only a quarter of the customer base previously estimated. I.e. 440,000 active members with let’s say 80,000 new

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So, in calculating the revenue for the year, we would compute for registration fees and plan charges income:

**Registration Fee**

\[
\text{Registration Fee} = \text{No. of new customers} \times \text{Rs. } 1,000,000 \\
= 80,000 \times 1,000,000 \\
= \text{Rs. 80 million}
\]

**Plan charges income**

For simplicity, assume the product mix is skewed towards the cheaper end and therefore every customer is charged a weighted average of Rs. 150/month.

\[
\text{Plan charges income} = \text{No. of customers for the year} \times \text{Rs. 150} \times 12 \\
= 440,000 \times 150 \times 12 \\
= \text{Rs. 800 million}
\]

**Total Revenue**

\[
\text{Total Revenue} = \text{Rs. 80 million} + \text{Rs. 800 million} = \text{Rs. 880 million p.a.}
\]

And there you have it. Your final answer for a revenue estimate for XYZ Ltd’s online DVD rental service based on very little data is 880 million Rupees p.a.

How correct this figure actually is will be based purely on your assumptions and logic. Why not try and back calculate how many DVD rentals this means per day (you’ll have to guess an average price first) and see if this revenue figures still seems sensible.
Problem – US Pizza Consumption

Estimate the number of pizzas consumed in the US in one year.

With so many 'fast food' and 'take-out' options available in the United States, it is no wonder that the humble pizza is consumed on such a large scale. The USA is arguably the world’s largest consumer of pizza and it is your job to estimate just how many pizzas the nation consumes in one year.

Possible Solution – US Pizza Consumption

This question can be answered much like the earlier question on cigarettes. Again, it is probably easiest to work down from the population and make some assumptions. The logic map on the next page proposes a possible solution using this same method.

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Possible Solution – US Pizza Consumption (Continued)

95% Eat pizza = 285 million
60% Regular eaters
= 171 million
20% Heavy eaters
Once per week
= 57 million
20% Occasional eaters
Once per quarter
= 57 million

57 million x 1/2 x 52 weeks
= 1,480 million p.a.

2.6 billion pizzas consumed in the USA annually

Number of Pizzas consumed in the USA p.a.
Population of USA = 300 million

5% Never eat pizza
(health conscious, dieting, infants, religion etc.)

Since pizza comes in a variety of different sizes
you can assume that on average the act of eating pizza involves eating 4 slices or roughly half a pizza.

171 million x 1/2 x 12 weeks
= 1,020 million p.a.

57 million x 1/2 x 4 weeks
= 114 million p.a.

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That concludes the worked solutions for estimation and market sizing case questions. Here are more examples of this style of case interview question for you to attempt and practice on your own.

**Other Market Sizing / Estimating Cases**

- Estimate the market size (in Euros) for car leasing in Germany
- Estimate how many fridges are made in the USA each year
- Estimate the total number of ears pierced in the UK
- Estimate the market for 'high end' handbags in Japan
- Estimate the number of cows used in McDonald's burgers in one year in the USA
- Estimate the market for used cars in France
- Estimate the market for boats in Australia
- Estimate the market for helicopters in New Zealand
- Estimate the number of shoes in the world
- Estimate how many products are sold on ebay.com every day
- Estimate how many people worldwide will watch the 2016 Rio Olympics Opening Ceremony live on television
- Estimate how many printed business cards exist in the city of London
- How many gas stations are there in Chicago
- How many buildings higher than 10 floors are there in the Northern Hemisphere
- How many people live exactly on the equator
- Estimate how many people have a tooth removed each day worldwide

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Business Problem & Strategy Cases

Case interview questions based on business problems and strategy decisions are designed to assess your ability to truly act like a management consultant thinking logically and creatively at the same time, to develop a practical business solution. In doing this, you can also demonstrate your strong commercial acumen. Unlike the previous style of estimation questions, which are often largely hypothetical in nature, this type of case question is often firmly based on real life problems the consulting organization has faced with clients or that your interviewer has personally encountered whilst working as a management consultant.

Again, there is no one right answer to this style of case interview question, however, your ability to propose inventive yet pragmatic solutions, will get you across the line with the interviewer. Sometimes you won’t really end up giving a final solution to these types of question, rather an in depth discussion of the issues being what evolves during the course of the interview and what the interviewer is looking for in your answer.

What the interviewer ultimately wants from you here is to be able to view you as a peer, either a consultant or analyst as part of their engagement team solving real life business problems and doing real management consulting work for clients. Gauging personal and organizational fit is therefore of key concern to them on top of your analytical skills.

Because this style of case interview question often comes in 2nd round interviews or after estimation based case questions, the focus on numbers and calculations is generally not as intense. Occasionally however, calculations will be required and often the numbers or percentages are given to you so that you may calculate things like marginal costs, profitability and required revenue per unit to break even.

It is obvious that some ground knowledge gained via university courses such as management accounting, managerial economics, engineering, project economics or any business and strategy courses for that matter will be of some advantage here. However, like all consulting interviews they are looking for anyone with an outstanding mind, a strong intellect, great attitude and a healthy, balanced personality.

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Section 3: Business Problem & Strategy Cases

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Section 3: Business Problem & Strategy Cases

and Cost modelling, Business Life Cycle Analysis, Mind Mapping and Key Issues Grouping are just some that are used and explained throughout the worked solutions of this section. Again, the same recommendations from earlier in this guide regarding the need to structure your solution and discussion, as well as demonstrating good time management should be applied to business problem and strategy cases.

Different Strategy Case Styles

Before getting into the actual real life case interview question examples and solutions, we should look at the several different types of business problems and strategy cases you may encounter. Each has a few obvious steps you should take to try and answer such problems, as well as areas you should think about and focus on. From our combined experiences and discussions with consultants, we believe there are around 10 of these generic types of business problem and strategy case questions. You can find more detailed information on common business problems/decisions in any organisational strategy textbook.

So, in the interest of providing you with more example case interview questions rather than business theory, in the later pages we have not provided specific examples for each one of the 10 types of question styles outlined on the following pages. We simply include this summary information here to help you be better prepared for anything that comes your way in your rounds of case interviews ahead.

Type 1) Entering a new market

Step 1: Investigate the new market to decide whether entering the market would represent a good business decision. Essentially assess the market’s attractiveness.

Step 2: If you are going to enter the market, you need to determine the best way to become a player in the market. The options are:

- Start operations in the new market from scratch
- Acquire an existing player in the market
- Form a joint venture or strategic alliance with another player

Type 2) Developing a new product

Step 1: Think about the actual product and if there is a need for it

Step 2: Think about your potential marketing strategy

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Step 3: Think about who your customers will be

Step 4: Think about the market position of the product. Will it be at the low end of the market and be low cost, or will it focus on quality and be priced high at the luxury end?

Step 5: Think about how to distribute the product

Step 6: Think about how to finance the project

Type 3) Pricing strategies

Step 1: Investigate the product and its components in detail

Step 2: Choose a pricing strategy:
- Consider Cost-based pricing or Price-based costing

- Cost-based pricing means determining the cost of a product, choosing a desired profit margin, and calculating a sales price.

- Price-based costing means choosing a desired sales price and costing out production to meet that sales price with a desired profit margin.

- Consider any supply and demand forces as this will impact on price.

Type 4) Growth strategies

Step 1: Ask probing questions to determine the nature of growth that your interviewer is looking for: is it focus on product, division, or the entire company?

Step 2: Choose the growth strategy. Some options are: increasing sales, increasing distribution channels, increasing product line, investing in a major marketing campaign, diversification of products/services, or acquisition of another organisation.

Type 5) Starting a new business

Step 1: Investigate the market to make sure that entering the market is a good business decision.

Step 2: Look at the project from a Venture Capitalist’s viewpoint:
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Section 3: Business Problem & Strategy Cases

- Financing
- Financial analysis of the proposition such as Return on Investment, Break Even

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Type 6) Responding to a competitor's actions

Step 1: Ask probing questions
- What is the competitor's new product or service offering and how does it differ from this organisation?
- What has this competitor done differently?
- Has this or any other competitor increased their market share?

Step 2: Create a response plan.
Examples include: Acquiring the competitor or another player in the market, merging with another competitor, copying the competitor, hiring the competitor's top level management away, and utilizing marketing to increase your profile.

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Type 7) Increasing sales

Step 1: Ask probing questions to gather information about the market and the product line

Step 2: Determine a strategy to increase sales
- Increase volume or increase prices
- Increase revenue from each sale (make buyers buy more)
- Create seasonal balance
- Increase demand for the product through marketing

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Type 8) Reducing costs

Step 1: Ask for or create a breakdown of the organisation's costs

Step 2: If any costs seem too high, determine why

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Type 9) Increasing profits

Step 1: Look at sales volume, price and revenues.

Step 2: Look at costs – fixed and variable.

Step 3: Determine whether you want to increase volume and how to do so. Example actions include expanding into new areas, increasing the sales force, increasing marketing, reducing prices, and improving customer service.

Type 10) Organisational Turnarounds

Step 1: Gather important information about the company and its situation.

Step 2: Choose an appropriate action. Be creative, but base your action upon a structured and well thought-out plan.

So now you have briefly seen the 10 different styles of generic business problem and strategy based case interview questions including some simple steps to structuring a solution. We now present several real life examples of business problem and strategy based case interview questions which have actually been asked to real life candidates in management consulting case interviews around the world. See if you can recognise any of the styles of cases from the 10 mentioned above.

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An IT consulting company operating in London is your client. It is experiencing some strong growth. In the coming months, it is therefore planning to expand the size of its workforce to meet this increased demand in business. How would you go about formulating a recruitment strategy for this company? What else would you need to consider?

This is a relatively short case question involving business strategy. The problem attempts to put you in the shoes of a consultant working with a client on an operational business issue. It would be useful to first brainstorm and discuss the issues around employee recruitment. Thinking out loud about where to source skilled IT labour, how much it will cost to attract the required talent, training costs and time frames looks to be what’s needed in this case question. During this initial thinking and discussion stage the interviewer may stop you and give you some more information, explaining that the client has come back to you and said that they are willing to assign only £30,000 ($50,000 USD) of additional cost to the recruitment project and that they are looking for roughly 20 new employees of varying skill levels.

### Possible Solution – IT Consulting

Skill and Experience – Can they get new graduates and train them up or do they need experienced hires. Maybe a mix of these would be best?
Possible Solution – IT Consulting (Continued)

Bonuses to entice people to switch jobs and come work for the client organisation, travel, and advertising are costs that will be incurred. Can the budget be increased?

Time – when are staff needed, how long will they be in training before they hit the ground so to speak, what about long term needs e.g., further growth?

Sources - Recruitment Agencies, Graduate Programs at universities, specialist executive head hunters, and advertising though employment websites and job classifieds are all options

Specific skills – What kinds of skills are actually needed by your client to achieve business growth? Sales, Consulting, Customer Relations, Administration, or Technical IT Consultants e.g., Business Analysts, Programmers, Systems Analysts, Database Developers, Network Professionals, Security Specialists, etc.

Numbers – how many new employees do they actually need? Is business demand driving the decision to hire new staff or does your client want new staff to first build a platform and capacity for growth. You may even draw these issues up into some form of diagram such as a mind-map on the next page to better explain the thinking.

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Possible Solution – IT Consulting (Continued)

From this initial identification of issues the interviewer tells you that the client has responded to some of your questions, specifying the following criteria:

- 20 new staff are needed
- Only half of these need to have strong technical skills
- A quarter need sales and or consulting experience
- A quarter are simply needed for administration.
- The budget has now increased to $60,000 for the recruitment effort with $10,000 assigned specifically to training.
- There is to be a mix of experience and skill
- All possible sources and locations are to be exploited. They want the best they can get for their money.
- All hires need to be made within the next 3 months and all new hires to start chargeable work within 6 months

The task now, is to break up the budget as logically as possible, therefore partially formulating a recruitment strategy to meet the client’s criteria. See the diagram on the next page for a possible first draft budget solution. Further work would obviously be required to create a full recruitment strategy for the client such as determining salaries, formulate timing schedules for hiring and training, etc. but we’ll finish it at the budget as that is probably all you’ll have time for given all of the initial discussion that you will have done.

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<table>
<thead>
<tr>
<th>Possible Solution</th>
<th>IT Consulting (Continued)</th>
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<tbody>
<tr>
<td>$50,000 Hiring</td>
<td>$10,000 to set up a graduate recruitment program from UK universities</td>
</tr>
<tr>
<td></td>
<td>$10,000 to advertise on local online jobsites for 5 admin staff (e.g. accountants, HR, IT Support etc.)</td>
</tr>
<tr>
<td></td>
<td>$10,000 in recruiting fees to find 10 technical staff</td>
</tr>
<tr>
<td></td>
<td>$60,000 USD in recruiting fees to find 10 technical staff</td>
</tr>
<tr>
<td></td>
<td>$15,000 for 2 current employees to travel to the USA and India to headhunt 2 top IT consultants and make international contacts.</td>
</tr>
<tr>
<td></td>
<td>$40,000 for contingency and incentive deals to get experienced hires to join company.</td>
</tr>
<tr>
<td></td>
<td>$10,000 for executive headhunter fees to find 2 more top consulting/sales staff from Europe and or UK</td>
</tr>
</tbody>
</table>

Maximum of $2,000 to be spent per hire. Means company can probably advertise position on several different sites: up to £25,000 each for the top 4 business/IT universities in Britain. Use two different recruiting agencies. Maybe one big and one small since generally pay only on success.

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A large commercial radio station in Calcutta, India, let's call it 'ABC FM', is interested in setting up a website to build loyalty by giving listeners more information on programming, events, competitions and to hopefully add some more to the radio station's bottom line. You are to estimate the monthly visitors to the website, to analyze which identifies the different costs of building and maintaining the website.

This is an example of a case interview question which is very open and you could go down any number of paths. It is important therefore, that you ask the interviewer for some guidance on things such as target market, audience share, or qualitative things like what the range of additional annual profit that could be expected from the website given your initial website visitor estimates?

Part 1: Website Traffic Estimates

Part 2: Revenue Opportunities

Part 3: Website Costs & Profit Scenarios

Part 4: Traffic Seasonality
By guessing the population of Calcutta. Since it is a city of India you can assume it's a fairly populated place. In fact it has around 15 million people when including the surrounding suburbs or even more depending on the definition of Calcutta. If you guessed anywhere between 5-20 million that's fine. It's just for the sake of simplicity.

For simplicity, let's assume that no visitors are expected to come to the website who are not already a listener of the radio station. This may not be realistic of course, but will at least likely to also have access to the internet. Thankfully the marketing department has done some research of its listeners which we can draw on instead.
The nature of this statistic is also a little ambiguous. ‘At least once per month’ is a very open

Of the 16% who say they will visit at least once per month let’s assume that half of these will
actually visit twice per month and of the other half, half of these (i.e., a quarter) will visit
once per month and a quarter only once every 12 months.

Calculating this through you get: 640,000 x (16%/2 x 2 + 16%/2/2 + 16%/2/2/12) = 130,000
visits per month approximately.

You may want to give a range 20% either side to account for any inaccuracies in your
assumptions, i.e., state that as a first pass estimate you think the website could achieve
between 105,000 – 155,000 visitors per month.

Part 2: Revenue Opportunities

Three examples are on the next page. See if you can add some

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### Possible Solution – Radio Station Website (Continued)

<table>
<thead>
<tr>
<th>Revenue Opportunity</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hosting advertisements from a variety of complimentary companies (preferable music, entertainment or news focused, local or national). As a last resort host Google Adwords or affiliate links.</td>
<td>This method requires very little additional effort on the part of ABC FM. The website developer should be able to easily integrate advertisements into a website and they or the advertiser will be able to count the number of clicks on or impressions of an advert in order to charge the advertisers on a cost per click basis.</td>
<td>Users may feel distracted by advertisements and their use experience might suffer (e.g. page loading times) thus reducing the number of hits on the website. Also untargeted advertising can offend or alienate the listeners.</td>
</tr>
</tbody>
</table>

| Selling online music as MP3s, via iTunes or taking orders for Music CDs, cassettes, DVDs, etc. | An FM station would know the current demand and trends and may be able to forecast better than music stores. This would also gel well with the current business line of the company and ABC FM could create its own recommendation or rating system for artists, singles, and albums. | The station might need additional staff for the back office work which would include order processing, procurement, delivery and handling customer complaints. It may be more cost effective to partner with a music store or website and forward orders or traffic their way in return for a commission on each sale. |

| Merchandise (e.g. T-shirts, Caps, Key chains, Wrist Bands, Jumbo sized Posters, etc.) can all be made available on the website for sale. The payment mode can be either through credit card, PayPal or similar. | Some positive effect, albeit small, as the initial purchasing of merchandise and inventory and delivery of products to the consumers will be significant cost drivers. | |
Part 3: Website Costs & Profit Scenarios

With further information already given to you in terms of comparable revenue and costs per visitor, calculating some profit potentials should be straightforward, since you have a monthly visitor estimate of 130,000 already calculated.

Given the revenue per visitor and cost range you were provided with, you may want to identify three profit scenarios for the interviewer:

Worst case scenario:
Rs. 5 x (100% - 80%) x 130,000 x 12 months = Rs. 2,340,000

Average case scenario:
Rs. 7.5 x (100% - 75%) x 130,000 x 12 months = Rs. 2,925,000

Best case scenario:
Rs. 10 x (100% - 70%) x 130,000 x 12 months = Rs. 3,120,000

Now before ABC FM gets too excited they'd need to properly cost the initial website development and any extra ongoing costs that are not factored into the 'costs = 80% of revenue' metric. You should mention things like this to the interviewer. There will also be a period of ramp up before numbers like this are reached. These figures are probably what can be expected after 2-3 years, i.e. once the site and revenue sources are fully established and visitor numbers reach their full potential and stabilize.

Part 4: Website Costs & Profit Scenarios

130,000 visitors per month was what you estimated at the beginning of the case, but now

1. This would require some good market research and assessment of economic data. They'll just want you to think in the shoes of the radio station owner and will probably just ask you...
1. Assuming the website visitors are predominantly young people, the number of visitors might drop during examination season as school and college goers may cut down on time spent on surfing the internet and recreational activities. Depending on the location or school setup, you might want to say there will be a drop of 5-10% off the standard monthly visitor estimates.

2. During summer vacation time, the usage might again increase as people would have a lot of free time on their hands and also the time at school/college can now be potentially utilized for surfing the website and listening to FM Radio. Visitors may go up 10-20% on the standard monthly visitor estimates.

See if you can think of some other things that would be an effect, e.g., religious festivals, weather etc.

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A large retail bank wants to acquire and integrate a large insurance company which sells a range of general insurance products and also life insurance into its banking operations. What benefits does it stand to gain in merging an insurance business into the retail bank? At what costs would such benefits come? What are the overall risks of this acquisition?

The merging of Banks and Insurance companies 'Bancassurance' in recent years has seen much regulatory debate. This business problem style case interview question might be relatively short and qualitative in nature but it also opens a lot of possible approaches that one can use during case interviews. It is intentionally open to test your commercial acumen and ability to remain focused at the same time. How many issues will you cover, how deep will you go on each one, how sensible are your comments giving the underlying complexity of this question and industry specificity?

These are all things the interviewer will be assessing you on. Since the case question requires you to show both benefits and costs, as well as the risks involved, you may want to draw up a table and perform a simple cost-benefit analysis. This may help you to structure your answer and better match costs and risks to the supposed benefits.

Possible Solution – Bancassurance

For simplicity, group costs and risks together. There may be some costs and risks that relate to the overall acquisition so just include these at the bottom or in a separate box. See if you can add more to our simple list.
The bank can easily differentiate itself in the market by offering an important complementary financial product to its clients. Offering both retail banking and insurance services will attract more customers to the bank and potentially increase customer switching costs in the long term. This should indirectly lead to increased customer loyalty as the bank grows to become a one-stop-shop for all the customers’ financial needs.

The cost of financing the acquisition (especially if it's a leveraged buy-out) may put upward pressure on the bank's pricing (i.e., interest rates) and insurance premiums in order for the new entity to maintain profitability levels, thus making it less competitive from a price perspective in both markets.

The bank must also be able to acquire the customer base of the insurance firm and then maintain and grow it. This may require retention of the insurance brand/s and regulatory approval due to prudential requirements.

The bank can leverage off its existing banking clients to cross-sell insurance products to. It could, for example, extract and analyse transaction histories and other information to profile existing customers to work out what insurance products they need at different times in their lives (i.e., when they buy a new car, house, boat, etc.) therefore offering customized insurance products and services at the right time.

Not being able to adequately cross-sell and thus acquire new insurance clients due to a breakdown of the expected synergies of the business model (e.g., capability of IT systems, data access, privacy laws, etc.) may lead to losses as the investment hypothesis isn't realised.

An insurance business can provide capital (in the form of premiums) to be liquidated by retail banks for lending (mortgages, business loans, auto loans, personal loans, etc.). There will of course be prudential systems, data access, privacy laws, etc.) may lead to losses as the investment hypothesis isn't realised.

As a retail bank, the acquiring company is already observing rules set by the governing regulatory body. However, buying an insurance firm would mean additional regulatory measures to observe and may increase due diligence on the part of the retail bank and a closer scrutiny of the insurance firm's data prior to acquisition and of the bank as a whole into the future.

Natural calamities and other unforeseen events...
circumstances that can lead to an unexpected number of insurance claims

Efficiency can be increased for routine operations of the merged entity.

The following are just three areas where the acquisition could lead to improved efficiency and there are bound to be many more:

1. Electronic fund transfer for premiums as well as claims by linking bank accounts to insurance and allowing bank branches to process insurance transactions.

2. Reduction in shared services costs such as Human Resources, Information Technology, Accounting & Finance, Executive Management, etc.

3. A reduced branch network as insurance is integrated into the banking operations.

With any merger or acquisition there is a raft of similar issues when it comes to integrating operations and striving for cost efficiencies.

- Downsizing may lead to loss of specialisation or expertise in the pool of resources
- Cultural integration and relationship issues between the two organisations can develop and impede progress
- Transitional organisational restructuring cost, which can be hiring cost or severance pay in case of downsizing.
- Training of employees to learn the new business goals of the organisation.
- Marketing re-branding and or Public Relations

An acquisition of this scale and subsequent merger could provide a unique opportunity to replace or enhance legacy core banking systems built in an antiquated programming language, with new technology – thus setting a platform for future growth and operating efficiency.

Developing new systems, enhancing existing systems or integrating 2 sets of disparate systems will come at a significant cost to the bank. Regardless of the strategy selected it should be fully costed into any financial analysis of the acquisition.

Naturally there will be some unforeseen development/integration issues in terms of varying IT systems and databases thus, increasing acquiring costs even further and likely delaying some of the expected synergies.

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If the acquisition is deemed opportunistic in terms of the amount paid for the insurance business vs. its implied value then the share price may get a nice uplift which will please shareholders, as will increased dividends if the insurance business is and remains profitable once acquired and integrated.

Depending on the complexity of the acquisition, transaction costs alone could saw into the millions. Pooling in-house resources or availing services of outside professionals to assess the potential of the insurance business with the bank, run through all forms of due diligence, tax, accounting, legal and regulatory issues. Finally, don’t forget the expensive management consultants that will inevitably get involved in the merger integration!

As alluded to earlier, unless sufficient available cash is held on the balance sheet, a large acquisition may require capital to be raised or equity to be given away. If capital is raised it may mean a rights issue with existing shareholders, debt, or any number of options. All carrying an obvious cost to the bank. If the synergies from the merger do not outweigh the transaction and financing costs alone, then naturally it is a bad investment decision.

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Shoes Ltd. has been operating in the Footwear market for the past 8 years. They believe they cannot expand their existing business any further in their current market segment (as they are the market leader), and so are considering the option of entering into the broader clothing and apparel sector. As their management consultant what would you suggest to the company before entering this market?

This is a very broad question and can be approached from many different angles. A whole business plan could be written up and probably would be by a consulting firm if engaged. However at its heart it is a question on market entry & horizontal diversification, so we'll try and keep things simple. Several standard issues and areas of consideration should be highlighted to the client and some initial suggestions made. You would want to conduct market research, develop forecasts and budgets and perform any other associated due diligence in relation to their apparel strategy.

Conclusions would then be formed off the back of this research. In answering this case interview question you can quite easily establish a simple framework and from there, give quite generic answers, however you would also want to bring in some specifics relevant to the two industries in question and probe for more information from the interviewer to help frame some useful analysis.

Possible Solution – Market Entry

In our possible solution we have broken the analysis down into things external to the business that cannot be easily controlled and things within the business that can be controlled i.e. internal capabilities. Other simple frameworks for analysis could also be applied to this case interview question, but as mentioned earlier in this guide, try to avoid forcing a framework onto a problem if there is not a natural fit.
Now, to start off you may want to mention to the interviewer that in order to analyse whether the new business can create value for the existing company, they'll need to consider two important areas: external forces and their internal capabilities.

Explain that this will be your focus and that you'll dig down into several of the various considerations under these two primary categories and make brief recommendations at each stage. Sometimes, the interviewer would look more into the facets of the solutions that you present rather than at the exact amount of detail and how correct you are as this can all be learned with in-house training and on the job experience. The interviewer really just wants to know how adept you are in terms of identifying issues, thinking logically, and if you can identify something out of the ordinary compared to other candidates interviewing later in the day.

External Factors

1) Competitive Environment of the Apparel Industry

One of the first and most important elements to be considered should be the industry's competitive structure. Who are the main players, what are their estimated market shares. Basically is there room for a new apparel player? We need to find out whether the competitive environment of the apparel industry is monopolistic, oligopolistic or does it display perfect competition (i.e. even competition). Is it a young industry with room for growth or is it already relatively mature?

Recommendation: The preferred competitive environment in order for the company to have the best chance of successfully entering the apparel market should be perfect or even competition since Shoes Ltd. would find it difficult to penetrate a market with one or a few dominant players, establish its product and presence in the industry on the back of its existing shoe brand. A young and growing industry is also preferred as it means Shoes Ltd.
Possible Solution – Market Entry (Continued)

Detailed market data from the last 5 years should be purchased on the apparel industry and competitors researched. Any analyst’s forecast on the industry will also be useful. Perhaps draw up a chart or matrix to highlight to the client how the apparel industry differs to the shoe industry to help the client understand the differences and thus the challenges they’ll face or opportunities that can be exploited. It may look as simple as this.

2) Competitors

As alluded to above, you’d need to research the primary competitors. Also dig around to see whether there are participants in the apparel market similar to Shoes Ltd. (i.e., a footwear company managing an apparel business). Look for any case studies both domestically and in foreign markets. If it has been done successfully before then this would give some confidence in the strategy if similar shoe companies are performing well in the apparel sector, but it could also indicate saturation of their product diversification idea at least domestically. That said, if Shoes Ltd is a market leader in footwear with a strong brand name, then it should not have too much trouble mimicking the diversification strategy of any direct competitors.

Recommendation: Using the competitor data obtained in the industry research phase above, collate and chart market share trends over the last 5 years. Maybe then extrapolate plot this against the analyst’s forecasted growth in the market to derive the ‘open market’ or leftover opportunity. It may look as simple as the chart on the next page.
Depending on the results of this competitor analysis, competition may not be feasible. If so, begin considering mergers, acquisitions and joint ventures.

3) Consumer Reaction and Demand

In order to promote a new product, the client will need to consider the customers' likeliness and willingness to purchase the apparel products. Do they expect their shoe customers to remain loyal to the brand and thus become customers of the apparel products or do they hope to gain entirely new customers? Also, they need to thoroughly analyse the future prospects for ongoing demand of the products.

Recommendation: Take a close look at analyst's growth outlook for overall demand in the industry. Is growth being biased by price increases or is it driven by volume increases? Also, if it's not stable, it might not be the right time to venture into the apparel market. To move away from relying too much on this data, organise for the marketing department or the organisation for the marketing department or the organisation to conduct research sessions with focus groups to gauge consumer reaction from both existing shoe customers and others who have never purchased the brand. Also, talk to store managers who stock the shoes to gauge their feelings, perhaps there is enough anecdotal evidence from customer enquiries to support a demand.

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A possible solution – Market Entry (Continued)

Retail store managers can be a great point of call for any retail research assignment because they are at that customer interface and therefore hold valuable information, if it can be extracted properly and delicately in interviews and workshops.

You'd now want to present the results of all this different research to the client, along with your recommendations. A bit of dialogue may open up with the interviewer at this point. They may tell you that the client likes what they see so far and believes there is value in their strategy. So now explain to your interviewer that you'd like to proceed to the next stage where you'll assess the client's internal capabilities to further determine if diversification into the apparel sector is feasible and if so how it will best be achieved.

Internal Capabilities

1) Production & Distribution

As explained at the beginning of the case question, Shoes Ltd plans to procure apparel from suppliers or contract manufacturers, brand it (i.e. add logos and tags), market it and wholesale it to retailers. Physical production capability of apparel items should therefore not be a problem worth investigating at this stage, however, some side issues are definitely worth analysing. How much control will Shoes Ltd. have over the apparel manufacture if they are essentially outsourcing it? Will Shoes Ltd. need to procure the raw materials such as cotton, lycra and other fabrics, elastic, thread, glue, Velcro, etc. or will this be left to the contract manufacturer. Shoes Ltd. may have some control over concept and design but will they have much control over quality and consistency of supply. Will contracts have a fixed ex-plant price for a number of years or will it be variable and move all the time. Can Shoes Ltd. utilise its existing distribution channels or will it need to forge new relationships, find new retailers, etc. Distribution channels also need to be effective so that not much of the working capital is locked up with stock in warehouses.

Recommendation: There are so many questions when it comes to how this strategy will work operationally. A reasonably detailed study will be required before a decision can be made on the apparel strategy to ensure costs and risks are understood. As a start Shoes Ltd. needs to determine how they want an outsourced production arrangement to work and then you could conduct a detailed review of short-listed contract manufacturers and suppliers or initiate a formal RFP/tender process. Shoes Ltd. should also consider the possibility of using more than one manufacturer to spread production risk and make sure...
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that any suppliers who supply to competitors are willing to supply goods to the company on good credit, without any interruption and with proper protection of IP (e.g., designs &

Finally, Shoes Ltd. must make sure that there is a critical mass of retailers who are willing to sell the new apparel products in their shops and begin building new relationships as needed.

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just as a start. Shoes Ltd. will need to make decisions as to how they staff up for the strategy. Will they poach the desired skill sets from competitors, or promote from within.

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The pre-requisite for the launch of any new product, especially a whole new set of products separate to your core brand is to continually promote it among the target customer.

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highest probability for success is what is needed for marketing a new set of products. Not being a marketer, you might want to explain that you’d want to talk to the marketing team.

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4) Pricing

First Shoes Ltd. will need to decide if it will be a low cost - low quality apparel retailer, high cost - premium quality retailer or somewhere in between. It should first analyse its shoe business to see where it sits in its customer’s eyes. Its brand quality and value position should transcend across to apparel, so this is important so as to not detract from the established shoe brand once apparel starts appearing in stores. The selection of a contract manufacturer as discussed above should also align with the outcome of this quality and cost decision. Once the pricing strategy is determined it is important for the company to set its retail and wholesale pricing for its apparel products, so as to be competitive whilst covering the product cost, personnel cost and promotion cost whilst still providing a fair profit margin.

Recommendation: The client should begin researching and costing certain products so as to determine if competitor retail and wholesale price points for similar products make sense for Shoes Ltd. and if the resulting margins for Shoes Ltd. will be healthy. If the volume is expected to be significantly higher than the shoes business then lower margins relative to their shoe products could be acceptable. However, low margins mean that the high volumes must be reached quickly in order to return any profitability from the strategy in the medium term. There is of course, no sense in apparel being a loss leader in an attempt to increase brand awareness of the shoes business and thus increase shoe sales because the market share of the shoes business is believed to have maxed out.

5) Capital Resources

No large obvious capital commitments are required to pursue diversification into the apparel market, i.e. there'll be no new manufacturing facilities built due to the contract manufacturing approach. However to enter this new market, Shoes Ltd will still need sufficient cash or pre-arranged access to capital to finance the pressure on working capital that will inevitably arise as a result of the natural timing lag between making payments on additional marketing, extra employees and associated costs, procurement of stock, and the revenue receipts from sales. If there is insufficient cash within the company to support this then capital in the form of Debt or Equity will be required. Specific finance decisions is another discussion all together and one not covered in any detail in this book, however, capital constraints is something the management consultant must be aware of.
Possible Solution – Market Entry (Continued)

Recommendation: Like with many finance decisions in large corporations, Shoes Ltd. may want to construct a discounted cash flow model with your firm’s assistance to forecast, analyse and compare the apparel market strategy with other growth strategies, e.g., geographical expansion, and compare such things as break evens, Net Present Value, Return on Investment, etc. to ensure the strategy is the ‘biggest bang for buck’ or at a minimum meet internal project hurdles or targets.

With several good discussion points and recommendation on the table for your hypothetical client, Shoes Ltd, the case interview may draw to a natural close, however, be prepared for the interviewer to push you further on certain areas and then throw some numbers around specific to the context of the problem for you to do some calculations and mathematical analysis right there on the spot.

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A small European airline is your client. They operate out of Eastern Europe. They fly roughly 20 different short haul routes throughout Europe and 2 long haul routes to Egypt and Morocco in Northern Africa. Profits are falling and you must find out why.

This problem is more challenging and will require an extensive exploration of the reasons why an airline may experience falling profits. One useful method for analysing this problem could be to use ‘Porter’s 5 forces’ model to analyse the forces at play in the industry and those impacting on the company. With profit equalling revenues minus costs, another suitable method to tackle this problem would be to break down and model the major revenues and costs of the airline to see where exactly revenues are falling or where costs are rising. However, we will not be doing that here.

Possible Solution – Airline

Initial thoughts on why an airline may be experiencing falling profits may centre on such things as price, demand, competition, fuel prices, hedging and rising operational costs. Using concepts from the famous ‘Porter’s 5 forces’ industry analysis may expand the picture beyond your initial thoughts and break open the problem at hand, helping us to find the real root cause/s. On the next page is a brief summary of ‘Porter’s 5 forces’ industry analysis model, if you are not familiar with it already.
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<tr>
<th>BARRIERS TO ENTRY</th>
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<th>THREAT OF SUBSTITUTES</th>
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Possible Solution – Airline (Continued)

Starting from the top you may think out aloud or discuss with the interviewer each of ‘Porter’s 5 forces’ as they apply to the client airline company, in an attempt to uncover part of the problem or at least narrow its scope.

Power of Suppliers

The primary suppliers in the airline industry are those that provide the aircraft (e.g., Boeing & Airbus), aircraft leasing and finance companies, fuel suppliers, food and beverage suppliers, and other services. Questions to be asked here should centre on ‘are the costs of inputs increasing?’, ‘are suppliers driving up costs?’ You are told this is not much of an issue.

Barriers to Entry

There are naturally large barriers to entry for start-up airline companies due to initial capital costs associated with aircraft and licenses, however the client in this case interview question is already established. One point to note is that fixed costs are huge for airlines with variable costs relatively low and this may be an issue worth exploring later. Other than that you are told that entry barriers are not really the problem.

Power of Buyers

People fly more and more these days. However, in the last 5-10 years the airline industry world-wide has seen a range of new low price competitors operating the short haul routes, especially in Europe. Companies like EasyJet stand out as an example. Combined with the internet and therefore availability of information, this gives a lot of power to buyers as they can pick and choose airlines based on the lowest priced airfares. Loyalty point schemes also play a part working as incentives for flying with certain airlines. Buyers, i.e., passengers, therefore have a lot of choice when it comes to airlines. Questions that should be asked here may centre on demand levels and how full each flight is (a term called load factor). You’re told that loading levels have been lower than normal.

Threat of Substitutes

Substitutes to air travel are things like bus travel, cruise boat travel, train travel, and car travel. Each of these has never really been able to compete with air travel. However, you state that the terrorist attacks of 9/11 and terrorism threats in general may have played a
Possible Solution – Airline (Continued)

Part in a reduction in demand for air travel. You are told this is not really an issue and figures show that demand for air travel is actually on a steady increase.

Competitive Rivalries

This industry force ties into the points made above with more and more short haul competitor airlines now in the market. With low switching costs to fly other airlines, passengers are doing this in droves, changing from one airline to another based on the cheapest airfare. Customer loyalty in the short haul airline industry is almost a thing of the past. You are told that competitor rivalry in Eastern Europe has increased in the last 3 years. Using a structured framework for your analysis, you have therefore narrowed the problem down to issues with demand and load factor as a result of increased competition. The point made regarding high fixed costs and low variable costs is now an important one. You are told that the airline requires each flight to run at 75% capacity to break even (i.e. revenues = costs) and that on average each flight over the last 12 months has only been at 76.5% capacity leaving them well short of their profit goal, which requires a minimum capacity of 82% on each flight.

The seemingly simple fix is to somehow either increase the load factor and hence revenues or decrease the costs to recast their break-even load factor of 75% down to maybe 70%.

With fixed costs by nature unchangeable (e.g., aircraft purchase/lease, fuel, crew, maintenance, head office) and variable costs based heavily on the number of passengers, the options to return profitability to its previous levels therefore are:

1. Increase demand/passenger numbers
2. Reduce the number of flights to consolidate costs
3. Reduce the number of managerial and administrative staff to reduce costs
4. Increase the price of a ticket but risk a further lowering of demand
5. Reduce the price of a ticket to increase demand and cut costs elsewhere

The only real solution from the above list is the first one: to increase demand to fly on the airline. This is generally done through marketing and promotion, which again costs money. As you begin to see, it is actually a very difficult problem.
At this point of the case question, the interviewer is happy with your discussion so far and the way you’ve explored the issues and narrowed the problem to only a few root causes. He or she may then get you to perform some simple calculations based on data regarding revenues as well as fixed and variable costs in relation to seat loading to demonstrate your mathematical ability and understanding of business concepts.

After all this, you are told that the CEO has been approached to enter into a new airline alliance with other carriers in Europe. This could be a perfect opportunity to boost sales and demand in the long term through established partnerships and shared deals. You are asked by the interviewer what the CEO should know about the alliance.

After some thought you may provide questions such as:

- Number of airlines in the alliance?
- Which specific airlines are in the alliance? You would not want any direct competitors who fly the same routes as you.
- Any costs to join the alliance—initial and ongoing?
- Expected benefits of the alliance—tangible and intangible?
- Detailed rules and policies for member airlines.
- Are new entrants allowed into the alliance?
- Does the alliance come with any exclusivity arrangements?
- Can you exit the alliance at any time?
- Are direct competitors flying the same routes, blocked from entering the alliance after it’s initially established?

And with these questions regarding the alliance forming the final discussion, the interview concludes. As you can see no single answer was ever given to the initial question, but a lot of analysis and exploration of the issues were performed as the interviewer guided you.

Often analysis and exploration of issues is all you can hope to achieve in a case interview concerning a business problem until some numbers are given to you.
Section 3: Business Problem & Strategy Cases

**Problem – RV Batteries**

Your client is a company who makes expensive specialist batteries for motor homes (Recreational Vehicle, RV) in the USA. The battery is very powerful, long-lasting and of high quality. New industry conditions are occurring and motor home dealers are starting to use a cheaper battery as the ‘factory standard’ in an attempt to lower the overall price of motor homes. Your client’s product is now only offered as an added feature, for which the customer must pay an extra $500. In this case question you are to discuss how your client should go about maintaining profits, given these new market conditions.

This question is again somewhat strategy related and will probably involve a brainstorming session and or discussion with the interviewer to work out possible avenues for the client to explore in an attempt to maintain profits, given the changing market conditions.

**Possible Solution – RV Batteries**

First you would want to write down some ideas and then discuss them with the interviewer. More ideas may develop in this process and you may want to create a mind map or table to categorize your ideas and ensure you have covered all the issues. Some of the profit maintaining ideas which may be a possibility for the client might include the following.

**Differentiation**

With the battery obviously being quite large, powerful and long-lasting the client company could attempt to differentiate their existing product designed for motor homes into other product markets and therefore attempt to sell the existing battery to work in large motor boats/yachts, trucks, and buses/coaches. This would be an initially costly exercise setting up contacts, finding sellers, marketing, etc. However, it has the ability to also grow profits in the future.

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Similarly the client could export the existing battery to overseas markets such as Europe and Asia for use in mobile homes/motor homes within those countries. Again this has high costs up front as trade partners need to be established but long term growth prospects as a result are high.

Enhance / Improve Service

Another somewhat simpler option is to stick with the current situation yet offer a greater product warranty on the battery to entice customers to upgrade to the better battery for the extra $500. For example, doubling or tripling the length of the warranty of their battery could be an option. The only costs associated with this plan would be in added service and or replacement.

Dealer Incentives

The client company could offer the dealerships selling the motor homes a 5-10% commission on any of their batteries sold. Therefore the dealer's sale staff would act as direct marketers or promoters of the battery, strongly recommending it to every customer, thus helping to increase sales. The only cost being the commissions that must now be paid out.

Joint Venture / Alliance

The client company could attempt to bundle their battery with other companies who provide added features or accessories that also do not come as part of the 'factory standard' setup of the motor home. For example, bundling the higher quality battery with leather seats, a better refrigerator unit, a high quality bed, larger hot water tank, etc. could mean that all additional/higher quality items could be bundled into a discounted upgrade package available together for an extra $5000 where if purchased separately would cost maybe $10,000. The cost here is in administration of the JV / alliance and the discount factor given for bundling.
Possible Solution – RV Batteries (Continued)

Produce cheaper and lower quality battery

The final option may be to compete directly with the battery manufacturer who has now become the default supplier. Either supply the existing battery at their lower price (however, this may not be possible) or design and produce a new lower quality, cheaper battery to compete. This last option may be costly and not very effective depending on who the competitor is and what their price point actually is.

With all these options raised and discussed the interviewer should be quite happy with your answer to the case question so far. The interviewer would probably now ask you to do some mathematical calculations in relation to the question.

For example, the CEO wants to know what the fall in profit will be given this new competitive situation if they do nothing. You are given the following information:

- The battery wholesales for $5,000
- Fixed costs equal $50 Million
- Variable costs equal $3,000 per unit/battery
- Sales volume equals 50,000 units per year

They expect a 50% drop in sales if motor home retail customers are expected to pay an extra $500 for the better quality battery.

**Current State**

<table>
<thead>
<tr>
<th>Battery Price</th>
<th>$5,000</th>
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<tbody>
<tr>
<td>Fixed cost per unit</td>
<td>$50 million / 50,000 = $1,000 per unit</td>
</tr>
<tr>
<td>Variable costs</td>
<td>$3,000 per unit</td>
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Therefore, profit per unit = $5000 – ($1,000 + $3000) = $1,000

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Possible Solution – RV Batteries (Continued)

Future State

Battery Price = $5,000

Fixed costs per unit = $50 million/25,000 = $2,000,000 per unit

Variable costs = $3,000 per unit

Therefore profit per unit = $5,000 – ($2,000 +$3,000) = 0

Total Profit = 0 x 25,000 units = $0

Therefore it is clear that the client must act given the new market conditions or they will only break even, making no actual profit!

The CEO has an initial idea of reducing the price by 5% to better compete with the lower quality battery of their competitor. This means the end customer only has to pay an extra $250 for their battery and the management team believes this may result in a drop in sales of only 25%, what would be their profit under this plan?

CEO’s Scenario

Battery Price = $5,000 x 95% = $4,750

Fixed costs per unit = $50 million/(50,000 x (1-25%)) = $1,333 per unit

Variable costs = $3,000 per unit

Therefore profit per unit = $4,750 – ($1,333 + $3,000) = $417

Total Profit = $417 x 37,500 units = approximately $15.6 Million

This initial idea may therefore be an option to enable the client to stay in business for the short term. However, it doesn’t come close to the goal of maintaining profits. Therefore the options proposed earlier should be explored.
Your client is a company who manufactures small detonators for use in mining and rock blasting explosives. They have factories in Latin America, Scandinavia, and North America (East Coast). They want to grow their profits but see no real opportunity for increasing revenues through increased price or volume. Therefore, you are to find how and where they can reduce costs.

This business problem has many issues and is in fact, very complex. As a case interview question and in limited time, the best way to approach the problem may be to first start modelling the costs involved in research, production, transportation, administration, marketing, and corporate overheads for the company. In fact, just as you mention that you will use a cost modelling approach to tackle the problem, the interviewer explains that the client company has no real understanding of their costs for each factory, but has some key cost figures to give you, to help work it out.

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<tr>
<th></th>
<th>North America</th>
<th>Latin America</th>
<th>Scandinavia</th>
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<tbody>
<tr>
<td>R&amp;D</td>
<td>$0.25m</td>
<td>$0m</td>
<td>$0.25m</td>
</tr>
<tr>
<td>Inputs</td>
<td>$15m</td>
<td>$20m</td>
<td>$20m</td>
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<tr>
<td>Production</td>
<td>$20m</td>
<td>$15m</td>
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<tr>
<td>Distribution</td>
<td>$20m</td>
<td>$18m</td>
<td>$25m</td>
</tr>
<tr>
<td>Administration</td>
<td>$10m</td>
<td>$10m</td>
<td>$15m</td>
</tr>
<tr>
<td>Wages</td>
<td>$10m</td>
<td>$6m</td>
<td>$14m</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$75.25m</strong></td>
<td><strong>$69m</strong></td>
<td><strong>$96.25m</strong></td>
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On first impression you can see that the Scandinavian factory has the highest costs and you express the idea of perhaps consolidating the Scandinavian operations into the North American factory to make one big factory. The interviewer explains that this could be a good idea considering the location of the different markets for their products. You draw up a map of the world and explain that consolidation of one or more of the factories would dramatically reduce the transportation costs across the Atlantic.
The interviewer then sketches in the current transport routes for distribution of their products to the different international markets. It is clear that the transport costs across the Atlantic Ocean would be eliminated and since R & D is performed at the North American factory this element of business would not be lost. In the graphic below, the circles show the locations of the factories and the dotted lines indicate the current transport routes.

After this initial discussion the interviewer explains that you will now be flown to each factory to see first-hand the operations there and collect more data. First stop is the Latin American factory. It is medium in size, quite old and they appear to work hard and use cheaper labour. As evidenced by the costs data table, no R & D takes place there. Next stop is the North American Factory. It is large, very new, modern, and clean. They appear to be running way under capacity considering the employee numbers and the amount of equipment. You quiz the management and they explain that they could probably run production in the North American factory at twice the current level, with a minimal increase in costs. Any increase in costs would be variable and go mainly to inputs such as material and energy. The last stop is the Scandinavian factory. It is more efficient than the North American factory and runs at nearly full capacity but labour costs means it is not as efficient as the Latin American factory.

After visiting each factory, you now have some additional information to add to the initial cost data. The interviewer hands you the following table.

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Having the employee numbers and output volumes helps to complete the picture. It is clear that the North American factory is least efficient and the Latin American factory most efficient primarily due to cheaper labour. The Scandinavian factory falls somewhere in the middle. With this new information some additional options present themselves.

Your client could move 500,000 units of production from the Scandinavian factory to the North American factory as the North American factory expressed that they could easily absorb double the capacity with minimal cost increases. Part of the Scandinavian factory could be decommissioned so that fixed costs at the Scandinavian factory would be reduced significantly. They could even expand the North American Factory to absorb all of the Scandinavian production and shutdown the Scandinavian operations, thus reducing transportation costs across the Atlantic.

Or, they could instead increase the size of the Latin American factory and consolidate all operations there to take advantage of the low cost of labour. It’s more centralised location would result in even greater transportation cost savings.
You quickly consider everything discussed so far and in the heat of the moment decide on a new option. Build a brand new, efficient factory on the West Coast of America and consolidate all operations there, bringing equipment and key employees from the North American and Scandinavian factories. It is envisaged that this plan will dramatically lower transportation costs as the new factory is now central to key product markets.

This answer is neat and acceptable and you are congratulated by the interviewer on a job well done.

Later he expresses that the case question was based on his own personal experience on a client engagement that he actually worked on whilst at the firm. It was a very complex problem lasting several months with many additional issues such as:

- Where are input materials sourced? i.e., chemicals, metal components, etc.
- Competitors locations
- Cost of expanding and/or building new factories

He informs you that what actually happened was that the client company bought out a larger competitor in Mexico and consolidated all 3 different operations into this single factory taking advantage of both cheaper labour and the more economical location in terms of transportation.

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Problem – Ice Cream Stand

Assume you have been granted a license to operate an ice cream vending business in a large urban park. Given the basic layout of the park (see below), discuss where would be the best place to put the ice cream business to maximise sales revenue. Be sure to justify any assumptions and explain your answer.

This case interview question puts you into the shoes of a small business owner to test your business savvy. It requires a careful analysis of the variables that will affect potential sales revenue and how they might be influenced by business location so that they can ultimately be exploited to maximise the takings of the business.

You are provided with the following diagram of the parks layout.
Competition

The first thing you should question the interviewer on is direct competition in the park. i.e., are there any other food or beverage stores currently operating in the park or near the park? You are told that no one currently operates in the park. However, a large shopping centre does back onto the park as stated in the diagram. Therefore, you will have a monopoly of the market within the confines of the park for ice cream and more generally food and beverage. Direct competition is therefore ruled out as an influencer.

Customer Traffic

Customer traffic will play a huge role in deciding where to place the business. You may explain to the interviewer that if you were the business owner you may want to attend the park on a few weekdays and weekends to see when the busy times are and where people tend to congregate. Things to think about here may include:

Roads and passers-by - If potential customers can see the store from the road, no matter whether they are in a car, bike, or on foot, then they may want to stop and purchase an ice cream from your stand.

Shopping centre customers - Shoppers may take their children to the park before or after shopping in which case they become potential customers of the ice cream business. However, you would want to analyse distance to determine if they would move their cars from the shopping centre car park to the park's own car park as this would be a factor in their decision to come to the ice cream stand.

People using the park - This is the most obvious and probably largest source of customers for such a business. Those who come specifically to enjoy the park are most likely to purchase ice cream especially on a warm summer’s day. Thinking about their movements between features of the park i.e., car park, swings, toilets, and pond becomes critical.

People walking through the park - The final thing to consider when it comes to potential customers are the people who may use the pathway that runs through the park as a shortcut or means to get where they are going on foot.
Location

As mentioned earlier, location here refers to placement of the business relative to the other attractions or features of the park. Intuitively, you may want to be equidistant or central to all attractions of the park to maximise exposure and thus potential sales. Spending a few days at the park would give you a better idea on this, but for now let's assume that on average there are as many people at the swings as there are at the pond, etc.

Based on this discussion you may want to draw up some kind of table and assign some form of score and weighting system to each variable and sub-variable to help quantify the decision. But for now let's just say that we have decided to place the ice cream vending business between the swings and the pond, but close to the path and close to the car park (see below). This also leaves it close enough to the main roads.

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Possible Solution – Ice Cream Stand (Continued)

opened up in the park between the swings and the toilets (see below). He asks 'what would you do now?'

Obviously the hotdog vendor means a new competitive market situation in the park. Whilst hotdogs are not a direct substitute for ice creams the business does represent a clear threat to sales for the ice cream business since consumers now have more choice when it comes to food and beverage in the park. Several options present themselves and should be discussed at length with the interviewer. Below and on the next page, some of the many potential options are briefly explained.

Do Nothing

This is the obvious first option. The two businesses will however cut into one another's revenues meaning less profit for each. This is not favourable for you, the ice cream vendor, since you were enjoying healthy profits before the hotdog vendor came along. By doing

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Joint Venture
The two vendors could go into partnership forming a joint venture operating from the one location under the same name and share in the profits. In doing this, they could still maintain prices and a monopoly in the park, however profits are shared.

Strategic Alliance
A softer version of the Joint Venture is a strategic alliance. It is based more on a shared understanding. The two locations could still remain but they agree not to tread on each other’s toes by not selling any of the other business’ non-core products i.e., drinks, chips, etc. You may even go so far as to agree that the hotdog vendor operates solely in winter and you solely in summer? But, of course, then you are only making money for half the year, which means half the profits again.

Differentiation
Since you are the established business in the park you can always expand your operations and start selling other products such as hotdogs, popcorn, burgers, etc. to fiercely compete and drive the hotdog vendor out, or at minimum, capture some of his market. There is of course nothing stopping him from doing the same.

Other possibilities exist and if you had time, you would want to rank each one based on maybe a cost benefit analysis, however we will leave that for you to do yourself and move on to yet more case interview questions.

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If you were given the option between owning a concrete business and owning a quarry, what would you choose and why?

Essentially this is asking where in the supply chain you would want to position yourself. A quarry extracts rock and stone from the earth through open-cut excavation. Quarries extract anything from simple rock through to high grade marble, and generally supply the raw materials for building products including concrete production. Quarries are therefore the first link in the supply chain of the building materials industry.

A cement business uses some of the raw materials from quarries such as lime, sand, clay, calcium, and other minerals, to mix and produce cement. This cement mixture is then distributed whilst still moist to local construction sites.

A SWOT analysis, should help to impress your interviewer.

Provides a careful evaluation of an organization's internal STRENGTHS and WEAKNESSES as well as its environmental OPPORTUNITIES and THREATS. It provides a holistic view of the
then a judgment call will be made based on which business has the strengths and opportunities that can best be capitalized on and the weaknesses and threats, which can be more easily avoided, mitigated or managed. You may want to interact with the interviewer asking for more information about each business as you go. If you were to use the SWOT analysis in answering this case interview question, you may end up with something like this:

**Concrete Business**

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Opportunity for product innovation. i.e. different grades and mixes</td>
<td>• Higher priced end product with healthy margins</td>
</tr>
<tr>
<td>• Once product is made, it must be delivered immediately. Therefore, for each processing plant, you can only service the local market.</td>
<td>• Liability if concrete quality is poor</td>
</tr>
<tr>
<td>• High capital cost for plant/factory, including ongoing maintenance</td>
<td>• Process intensive and logistically challenging</td>
</tr>
</tbody>
</table>

**Possible Solution**

- Concrete vs. Quarry

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From your SWOT analysis and some discussion with the interviewer, you might conclude

Quarry Business

- Low competition and high barriers to entry due to permits/licenses and initial capital cost.
- Can operate on a global scale
- Can vertically integrate and acquire cement plants and other building materials companies
- Natural resources can and will run out in the long term
- Government legislation & environmental protest
- Susceptible to market price fluctuations

Strengths

- Little input costs and resources, only labour and machinery
- Large number of buyers which can be geographically dispersed
- Product already exists in the ground, just a matter of getting it out
- Generally a larger company with high volumes

Weaknesses

- Little opportunity for change or innovation
- Low priced product with low margins
- Growth opportunities limited
- High capital cost of machinery
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A retail bank is expanding and wants to know where the optimum locations are to put its bank branches. How would you go about creating a model or framework for solving this? Consider a macro perspective, i.e., not what specific street or block to put it on, rather, what suburbs, towns, districts, or areas.

The location of a shop front for a physical business is always important as you must maximize the potential customers who could visit the premises. For an expanding retail bank, the importance of the location of its bank branches should be no different. On first glance this case interview question is challenging to say the least, but it can be made easier by re-introducing the concept of a population critical mass. You may remember this concept from an earlier question in the guide within the estimation and market sizing section.

Possible Solution – Bank Branch

The first point you may think to mention to the interviewer is about how similar shops and businesses, which have customers who must come to them, are found clustered together. Consider the location of clothing stores in shopping malls, car dealerships along a stretch of road and restaurants along a river side promenade. This happens because it makes it easier for each business to capitalize on the collective foot traffic, as well as for customers and potential customers to identify zones of clustered business. Bank branches are a little different due to their relationships with the customers and the fact that their profitability doesn’t rely on walk in traffic. However, this general rule of clustering can still be applied.

Locating them near other retail bank branches should therefore be the first aim. However, this is in fact a micro objective and so is not helping to answer the question. Now, in terms of developing a macro model for the optimum location of bank branches you will need to discuss some better ideas with the interviewer.
time and service both business clients and individual clients, the population critical mass should probably be more of a day time calculation. Therefore taking into account where.

Bank branches differ in size between large and small so perhaps two critical mass figures can be used for two different sized branches (large and small) which ensure that those living in.

So far you may have some variable such as:

- Critical mass of larger than X for a large branch
- Critical mass of between Y & X for small branch
Using these variables, you could draw a diagram such as the one below to explain the conditions which must be satisfied to make opening a large branch feasible.

As can be seen, some function of the number of residents, number of workers (exclusive of those who are also counted as residents) and the number of businesses times a multiplier must be larger than the critical mass figure within an area of radius $Z$ miles.

The function may be something as simple as:

$$f(R, W, B) = \frac{R - (\text{number of residents under 18})}{4} + \frac{W - (\text{number of workers already classified as residents})}{4} + \frac{B}{3} \times 10$$

So, if there were 60,000 residents in the area of a $Z$ mile radius, of which 15,000 are under the age of 18, with 20,000 workers coming into the area during the day not already counted as residents and 500 small businesses.

Your function would look like this:

$$\left(\frac{60,000 - 15,000}{4}\right) + \frac{20,000}{4} + \left(\frac{500}{3}\right) \times 10 = 18,000$$

If the result of the calculation to satisfy a large branch must be higher than 15,000, the area under question would get a large bank branch close to the centre of that area. However be sure to take into consideration the earlier micro objective of clustering, i.e. placing bank branches close to one another or at the very least near a shopping mall, or other commercial area.
If the rules governing your model required the result of the calculation to be above 20,000 for a large branch and between 10,000 and 15,000 for a small branch then in the previous example the area would get a small bank branch. Similar logic could be applied to less populated areas by increasing the radius of the critical mass area.

You now have the basics of a simple working model to show to the Bank. The Bank may then help to determine the required critical mass number and the size of the area based on their existing bank branches, expansion strategy, expected market share, etc. You could then go and obtain the vital population, demographic and business data from local and national statistics bureaus for target states and cities. Putting all of the data, variables and calculations into a well-designed spreadsheet or database, would then be well on the way to creating a good model to use as a management decision making tool.

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A C IO / IT Manager wants to analyse his IT application portfolio. How would you go about segmenting this?

This is a short case question and will primarily involve a discussion with the interviewer around some key ideas. It is a different style of question since it appears on the surface to be very much IT specific, however, once you start thinking about the problem it is simply a question designed to see how you solve problems, think about a business, and categorise things. Having an IT background may be an advantage, but having strong business instinct and problem solving skills, is probably more important in brainstorming possible solutions.

Possible Solution – IT Portfolio

The first thing that should be discussed is the motive or goal of the CIO in analysing the IT application portfolio. Does he want to ultimately minimize the number of applications in use within the organisation, cut costs by reducing technical support staff, introduce new software applications, enhance security, form new outsource relationships, or simply neaten up the current application portfolio by consolidating redundant and old systems?

Is the exercise part of a larger risk management initiative or something required by external auditors? Points such as these should be raised initially to show the interviewer that you recognise the importance of first truly understanding the drivers behind a problem before attempting to solve it.

The interviewer may simply select one of the motives mentioned above to help you narrow the scope of the problem, and formulate the best method of segmentation. Below and on the next page are some simple options for segmenting an IT application portfolio.
Possible Solution – IT Portfolio (Continued)

disappeared or was down for a period of time. Both tangible and intangible impacts would need to be considered and this may become hard to quantify, leaving a bias towards transaction processing systems.

Total Cost of Ownership (TCO)

Similarly, the IT applications can be categorised based on the total costs they bring to the organisation. TCO is a common term in IT management as it is something that should always be considered and minimised. TCO includes such things as the initial build/purchase costs as well as all ongoing support and maintenance costs, any associated hardware costs, licensing fees, etc. However, this method of categorisation may leave a bias in favour of small, low cost applications.

Business Process

Another way of categorising IT applications may be to look at what business process they support. Business processes may include such things as sales, marketing, manufacturing, purchasing, distribution, payroll, accounting, etc. For instance, 4 different applications to process purchases from suppliers could be considered somewhat inefficient and perhaps the differing functionality could be consolidated into one application.

Users or Organisational Spread

A simple method of categorisation may be to look at how many people within the organisation actually use the application, or how many instances of installation there are. For instance, a piece of software may have been purchased along with licensing for 100 users. If only 20 people are found to actually use it, then perhaps the licensing arrangements can be scaled back or at the very least all future software purchases and license agreements will be looked at more carefully. Also, imagine an organisation in which there are 6 offices around the country each with a different application for processing sales orders. These 6 applications could probably be consolidated into one application, thus reducing support costs dramatically.

Technology Platform

The last option we’ll mention is in relation to the underlying technology involved with the application. Categorising the application portfolio based on things such as which...
Possible Solution – IT Portfolio (Continued)

application portfolio. For example the CIO may want to remove/replace all systems which use Oracle databases in preference of SQL databases.

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missed and that the inherent bias of some of the above categorisation methods does not directly show through in any final evaluation and hence, decision. As a simple example, there may be a preference for certain technical aspects of applications which may be IBM, etc.

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As you may already be aware, many blind and vision impaired people around the world use specially trained assistance dogs.

You decide that it may be best to draw up some kind of diagram to help clarify your thought processes. You decide that something similar to the Value Chain would be the best place to start. It will help to analyse costs and hopefully make sure...
Now, thinking specifically about a not-for-profit organisation and adapting your diagram, you may get something more like this:

(Finance Legal, IT, HR etc.)
Fund Raising

- Merchandise Costs
- General & Administrative expenses (hence the overlap in the diagram)

Breeding and Selection of Dogs

- Purchase cost of suitable adult dogs for breeding
- Property, facilities and kennel costs (rented or owned)

Training and Care of Dogs

- Trainer Costs or Wages

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The difference between not-for-profit organisation and a commercial enterprise. The not-for-profit makes no money for its goods and services, and must therefore rely on donations to

- Transport and delivery charges
- Costs in relation to owner initiation and training (i.e., employee wages)
- Ongoing veterinary costs
- Depending on the arrangement, living expenses such as food for the dog may be paid for by the association.
- Administrative expenses

Promotion and Awareness

All not-for-profit organisations such as charities and associations must promote themselves to increase the level of donations and funding. Some are given money from the government and others subsidised rates for television commercials and radio ads. Costs here may therefore include:

- Awareness Advertising (TV, Radio, Print)
- Merchandise Design and Manufacture
- Events and Functions

Administration

All organisations big and small, not-for-profit included, incur administrative expenses. Therefore some costs here would go towards:

- Accounting and Finance (including wages of these staff, auditors, bank fees, etc.)
We finish there with a fairly simple yet well thought out explanation of some of the major costs a guide dog association may incur. The early steps of diagramming the value chain demonstrate how important it is to structure your response in some way to provide a sound platform from which to then best expand upon to best answer the case question.

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Problem – Widget Production

Widgets (a generic consultant speak manufactured product) are produced in Boston and Houston, but both companies sell the widgets in New York. The Houston costs, however, are lower than in Boston. Why?

Since much of a management consultant's work involves either maximizing a client's revenues or minimizing their costs it is important for an interviewer to examine a potential employee's general understanding of business expenditure. This question does just that, by asking for a comparison of the organizational costs of two fictitious companies producing the same product in two different locations, and selling it in the same market. In answering the problem, an interactive discussion with the interviewer around some key ideas will no doubt develop. Depending on the time available the interviewer may also want to introduce some figures.

Possible Solution – Widget Production

The first thing you may want to do in answering this case question is to draw a rough map of the USA noting the positions of Boston, Houston and New York. This can provide the basic geography of the question and form the starting point of your cost investigation. Such a map is provided on the next page.
Looking at this map of continental USA, you would assume that the Boston Company has somewhat lower transportation costs that the Houston Company due to the large discrepancy in distance between manufacture and market for the two companies. Since you are told that Houston has the overall lower costs, transportation costs can probably be eliminated from the investigation at this point.

The ensuing investigation of costs may then flow as follows.

**Economies of Scale**
Climate

Since Boston has a rather cold climate in winter, perhaps the company operating up there is incurring more costs in relation to heating bills or factory downtime, due to snow storms, and or dramatic cold snaps? You are told this is not the case and that the company in

Efficiency

You are told that this is not the case and that the company in Houston incurs similar costs and disruption in regard to cooling due to its much warmer climate. Perhaps the Houston company has better equipment, machinery, management and processes, compared to Boston and therefore manages to keep costs down due to its efficiency? You are told that this is not the case and that the organizational structure, processes and factories are very similar. Houston however does seem to spend less on raw materials and components. You decide to then investigate this issue further by asking questions regarding who supplies such components and where raw materials are sourced. You are told that Houston sources metals from South America, glue locally within the city, and components from Dallas. Boston sources metals from Africa, glue locally, and pre-made components from California.

Using this information you may guess that the raw material metals from South America cost less since they don’t have to travel as far, and therefore transportation costs are lower. However, you are told this is not the case and that both companies pay a very similar price for sheet metal even though it is sourced from two different world locations.

Staying with this issue you discuss the supply of pre-made components and the fact that Dallas is very close to Houston and California very far from Boston. Again you are told this geographic fact has no impact on input costs.
Possible Solution – Widget Production (Continued)

Knowing that the root cause of the cost differential is related to the cost of inputs such as raw materials and components, you are determined to find the underlying reason. You explore and discuss other ideas and discover that the Houston Company has a long-standing relationship with its component supplier in Dallas and signs 24-month contractual agreements locking in a low, fixed price for the input components. The price Houston pays is 40% lower than what Boston is paying for its component supplies from California. This single fact is what is contributing to the cost differential between the two companies operating in Houston and Boston, yet both selling in New York.

As evident, the first assumptions related to geographical differences were not an issue, with the cost differential coming down to supplier relationships and long-term contracts.

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That concludes the worked solutions for business problems and strategy based case questions. Here are more examples of this style of case interview question for you to attempt and practice on your own.

- There is an Aluminium window frame manufacturer based in Germany that supplies Western Europe and achieves revenues of 2 billion Euros annually. The CEO went on a recent holiday to nearby Russia and found out that there is a lot of medium density residential construction work occurring there. The current sales into Russia amount to a mere 5 million Euros, owing to the limited international presence of the company. Could Russia be an attractive market to the aluminium window frame manufacturer? If yes, how can it properly enter the market to become a significant player?

- Create a short business plan for a pharmaceutical company, which has recently developed a new medical device, illustrating how you would bring it to the market. Within the plan, be sure to contemplate the main costs and talk about pricing of the new device. Also address the advantages and disadvantages of the company using only their own resources and capabilities to bring the device to market, versus finding a business partner such as a medical equipment manufacturer?

- Imagine you were from Russia and tasked with organising the 2018 football world cup. How would you organise the event so as to make the event the best it can be whilst maximising the benefit to the nation and people of Russia?

- Is it profitable to launch a new coffee shop in your town? Consider up front capital, ongoing costs, and revenue factors as well as market demand for coffee and related products.

- What are the advantages and disadvantages of a cash transportation and processing company buying its competitor?

- What are the major costs associated with a large retail bank?
Section 3: Business Problem & Strategy Cases

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1. I am a company that sells a number of goods across Europe. Should I enter the high-end retail women’s clothing and accessories market in the USA?

2. What are some reasons why a major retail bank would want to form an alliance with another major retail bank? If your acquisition strategy included closing down branches, what method would you take to choose which branches to close?

3. An airline company is seeing its aeroplanes miss a great deal of their ‘leave times’. How costly is this to the company? Consider both operational costs and sales/reputation costs.

4. Your client is deciding whether or not to purchase a struggling consumer rental company. What do you need to consider and what information do you need to know? Can the rental company be turned around from its current financial state?

5. Determine if the 2012 London Olympics Games were profitable. Consider all possible costs and revenues.

6. The government has just announced that they are cutting tariffs on cement imports. You have 10 mins to figure out whether this is a large issue, and how this will affect your business if you are a cement manufacturer. Note: consider competitors, transport of cement, demand now and in future, prices, your plans and strategies e.g. expansion.

7. Your client is a hotel attempting to make the decision on whether or not to setup a website that sells stressed rooms (rooms that aren’t going to be used for the night) at a short timeframe i.e. less than 5 days and at a cheaper price. What information will they need to help them make a decision?

8. How would you go about forecasting the production of jet engines in the world?

9. Your client sells automobiles and is seeing falling profits. Investigate all possible revenues and costs and try to determine why.

10. Using revenue and cost modelling, try and workout the annual profit of a major shoe company such as Adidas.
Your client manufactures average-cost, average-quality, LCD televisions. Sales have recently been falling. What should be their strategy going forward and which markets should they sell in?

Your client is a new internet start-up. What information do they need to know in order to increase their chances of being successful?

Your client manufactures furniture. They are considering moving some of the manufacturing process into India. What do they need to consider before doing so?

Your client makes portable music players such as mp3 devices. What should their strategy be given the huge wave of popularity surrounding Apple iPod's?

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Case questions involving the analysis of graphs and charts, the analysis of sizeable sets of data and finally the creation of charts based on this data are becoming more popular in management consulting interviews.

These exercises stray from the bounds of the more traditional styles of case questions discussed so far. Data and Charts based exercises are generally more involved than estimation based case questions and business problem cases, and can take longer to complete. Others however, may be somewhat shorter and actually turn into a business problem style case interview as you are made to discuss and explore the underlying issue behind a graph. Some data and chart based exercises should be labelled as more of an aptitude test or entry examination than an actual case interview as you may be left in a room to complete the exercise by yourself and hence there is no interaction with the interviewer till the end when you may have to present your answers and findings.

Data and Chart based exercises are designed to assess your ability to understand data and see patterns and trends behind the data. They also give the organisation some insight into your abilities as an analyst, which is a key role for a junior consultant. Having to construct basic charts using pen and paper or more commonly with the assistance of software applications such as Microsoft Excel and Microsoft PowerPoint brings to light your ability to highlight key business themes within data and allows the organisation to see what type of focus you take, whether it be macro or micro, operational or financial.

After creating some graphs and charts you may even be asked to stand up and present an overview of your findings to a group which will allow you to demonstrate your presentation and persuasion skills.

Data and Chart based exercises can also be a useful tool to assess a candidate's basic computer skills, especially in Microsoft Excel and to a lesser extent Microsoft PowerPoint if asked to put a few slides together for an overview presentation.

As a final word, remember that graphs and charts are powerful decision making tools. So when creating charts, use neutral colours, label each axis, maintain a legend, keep the chart uncluttered, keep the chart relatively simple and feel free to use more than one chart but remember to keep the scale and units consistent.

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In this section we first present one real life example of a Data & Charts based exercise which was actually given in a management consulting interview. Due to the amount of data tables we only have room for one of these examples in this guide, however we believe this single example is comprehensive enough to adequately demonstrate this type of interview exercise. Its size should also help to prepare you for similar interview exercises involving data and charts as there are obviously many possible answers which can be drawn from the exercise, so see if you can find others.

The other case questions in this section then focus on the interpretation of graphs and charts and applying business logic to explore and understand what the chart represents. Note that they flow naturally into business problem style case questions.
Problem – Copper Production

The Process

This test was called a ‘remote analysis exercise’ in which the candidate was placed in a room and given a laptop computer. They were told to read all the instructions included below before commencing. They had 60 minutes to return their work back to the assessor. If they had any questions about the test, the software or anything else, they could contact them using the details provided in the covering email.

They were instructed to save their results using their name as a filename before emailing them back to the assessor (e.g., JohnSmith.doc).

Documents Provided

The exercise required the use of the following documents included with the original email. These were:

- Writing & analysis test.doc (Microsoft Word)
- Writing & analysis test.ppt (Microsoft Power Point)
- Tables.xls (the data in Microsoft Excel)

The candidate had to check that they could open and read them all before they were required to start the test.

The Exercise

The spreadsheet containing tables had data used to support mock client organisations out-of-date reports. The spreadsheet could be used to tell a number of different stories. The assessor wanted the candidate to pick out one story from the data and to write up a 2 page briefing that might be used in preparation for a meeting with an interested industry expert.

The candidate was instructed to include a chart in their briefing using either Microsoft PowerPoint or Microsoft Excel.

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What they were looking for

The consulting firm was looking for:

- logical analysis,
- clear structure,
- correct spelling and grammar,
- concise expression and,
- an interesting story.

Therefore, if the candidate felt that the numbers were too dry and wanted to embellish them, they could feel free to invent additional facts that supported their case.

It was noted that this exercise was not a test of their knowledge of the metals industry, and that there are essentially no correct answers.

Background & Notes

The spreadsheets that are shown on the following pages (the candidate could view it in Microsoft Excel) includes 15 different data tables. The data refers to "copper and copper alloy semis". These are semi-finished products made from unwrought copper or copper alloys, either rolled or extruded. They are used in a variety of applications, mainly in electrical equipment and in construction.

"ACR" refers to air conditioning and refrigeration. "e" refers to an extrapolated full year estimate, since the last year of data is incomplete and sometimes only goes from January to October (months 1-10).
Table 1: Production and consumption of copper semis in selected countries and country groups, by product, 1997-2002 (tonnes)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional Total</td>
<td>2,969,441</td>
<td>2,841,098</td>
<td>3,145,036</td>
<td>3,503,609</td>
<td>3,863,554</td>
<td>4,280,488</td>
</tr>
<tr>
<td>Production</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumption</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net imports</td>
<td>264,804</td>
<td>294,383</td>
<td>354,232</td>
<td>443,681</td>
<td>582,640</td>
<td>749,035</td>
</tr>
<tr>
<td>Wirerod</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production</td>
<td>1,948,100</td>
<td>1,882,435</td>
<td>2,105,985</td>
<td>2,377,325</td>
<td>2,656,325</td>
<td>3,004,415</td>
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<tr>
<td>Imports</td>
<td>89,611</td>
<td>105,971</td>
<td>129,158</td>
<td>183,114</td>
<td>264,407</td>
<td>392,954</td>
</tr>
<tr>
<td>Exports</td>
<td>43,848</td>
<td>54,042</td>
<td>37,952</td>
<td>32,353</td>
<td>37,389</td>
<td>36,368</td>
</tr>
<tr>
<td>Consumption</td>
<td>1,993,863</td>
<td>1,934,364</td>
<td>2,197,191</td>
<td>2,528,086</td>
<td>2,883,343</td>
<td>3,361,001</td>
</tr>
<tr>
<td>Copper Sheet, Strip and Plate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production</td>
<td>202,220</td>
<td>189,548</td>
<td>214,275</td>
<td>210,694</td>
<td>229,506</td>
<td>248,450</td>
</tr>
<tr>
<td>Imports</td>
<td>97,530</td>
<td>115,103</td>
<td>109,324</td>
<td>154,867</td>
<td>179,984</td>
<td>178,135</td>
</tr>
<tr>
<td>Exports</td>
<td>4,893</td>
<td>4,523</td>
<td>7,291</td>
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Table 4: Chinese imports of wirerod by origin, 1995-2002 (tonnes)

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Table 5: Chinese imports of copper and copper alloy sheet, strip and plate by origin, 1995-2002 (tonnes)

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Table 6: Estimated imports of ACR tube into China by origin, 1995-2002 (tonnes)

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Japan</td>
<td>13,127</td>
<td>15,054</td>
<td>14,299</td>
<td>17,042</td>
<td>25,184</td>
<td>23,273</td>
<td>23,857</td>
<td>15,069</td>
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<tr>
<td>Malaysia</td>
<td>1,302</td>
<td>1,235</td>
<td>1,349</td>
<td>3,242</td>
<td>6,902</td>
<td>3,277</td>
<td>4,293</td>
<td>2,978</td>
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<td>South Korea</td>
<td>770</td>
<td>1,326</td>
<td>1,357</td>
<td>3,103</td>
<td>4,264</td>
<td>4,239</td>
<td>4,134</td>
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<td>Thailand</td>
<td>296</td>
<td>85</td>
<td>116</td>
<td>421</td>
<td>476</td>
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<td>4,268</td>
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<td>Total</td>
<td>15,495</td>
<td>17,700</td>
<td>17,121</td>
<td>23,808</td>
<td>36,826</td>
<td>32,353</td>
<td>36,552</td>
<td>23,195</td>
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Table 7: Chinese exports of copper and copper alloy sheet, strip and plate, 1997-2002 (tonnes)

<table>
<thead>
<tr>
<th>Year</th>
<th>Copper</th>
<th>Copper Alloy</th>
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<tr>
<td>1997</td>
<td>3,394</td>
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<td>1998</td>
<td>2,000</td>
<td>16,127</td>
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<td>1999</td>
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<td>22,431</td>
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<td>1,450</td>
<td>30,242</td>
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<td>2001</td>
<td>1,596</td>
<td>18,078</td>
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<tr>
<td>2002</td>
<td>5,320</td>
<td>24,881</td>
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Table 8: Egyptian production and consumption of copper semis, 1997-2002 (tonnes)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Production</th>
<th>Total Consumption</th>
<th>Net Imports</th>
</tr>
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<tbody>
<tr>
<td>1997</td>
<td>12,900</td>
<td>15,950</td>
<td>3,050</td>
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<tr>
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<td>12,900</td>
<td>16,714</td>
<td>3,814</td>
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<td>13,900</td>
<td>16,979</td>
<td>3,079</td>
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<td>2000</td>
<td>29,900</td>
<td>33,050</td>
<td>3,150</td>
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<td>2001</td>
<td>82,800</td>
<td>85,950</td>
<td>3,150</td>
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<td>2002</td>
<td>94,800</td>
<td>97,950</td>
<td>3,150</td>
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<table>
<thead>
<tr>
<th>Year</th>
<th>Wirerod Production</th>
<th>Wirerod Imports</th>
<th>Wirerod Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>4,000</td>
<td>100</td>
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<tr>
<td>1998</td>
<td>4,000</td>
<td>138</td>
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<tr>
<td>1999</td>
<td>5,000</td>
<td>409</td>
<td>0</td>
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<tr>
<td>2000</td>
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<td>2001</td>
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<td>2002</td>
<td>86,000</td>
<td>500</td>
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<table>
<thead>
<tr>
<th>Year</th>
<th>Copper Sheet, Strip and Plate Production</th>
<th>Copper Sheet, Strip and Plate Imports</th>
<th>Copper Sheet, Strip and Plate Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>2,100</td>
<td>700</td>
<td>0</td>
</tr>
<tr>
<td>1998</td>
<td>2,100</td>
<td>1,106</td>
<td>0</td>
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<tr>
<td>1999</td>
<td>2,100</td>
<td>670</td>
<td>0</td>
</tr>
<tr>
<td>2000</td>
<td>2,100</td>
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<tr>
<td>2002</td>
<td>2,000</td>
<td>700</td>
<td>0</td>
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<table>
<thead>
<tr>
<th>Year</th>
<th>Copper Water and ACR Tube Production</th>
<th>Copper Water and ACR Tube Imports</th>
<th>Copper Water and ACR Tube Exports</th>
</tr>
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<tbody>
<tr>
<td>1997</td>
<td>0</td>
<td>700</td>
<td>0</td>
</tr>
<tr>
<td>1998</td>
<td>0</td>
<td>657</td>
<td>0</td>
</tr>
<tr>
<td>1999</td>
<td>0</td>
<td>720</td>
<td>0</td>
</tr>
<tr>
<td>2000</td>
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<tr>
<td>2002</td>
<td>0</td>
<td>400</td>
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<table>
<thead>
<tr>
<th>Year</th>
<th>Copper Alloy Strip Production</th>
<th>Copper Alloy Strip Imports</th>
<th>Copper Alloy Strip Exports</th>
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<tbody>
<tr>
<td>1997</td>
<td>6,000</td>
<td>900</td>
<td>0</td>
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<tr>
<td>1998</td>
<td>6,000</td>
<td>1,187</td>
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<tr>
<td>1999</td>
<td>6,000</td>
<td>665</td>
<td>0</td>
</tr>
<tr>
<td>2000</td>
<td>6,000</td>
<td>900</td>
<td>0</td>
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<td>2001</td>
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</tr>
<tr>
<td>2002</td>
<td>6,000</td>
<td>900</td>
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<table>
<thead>
<tr>
<th>Year</th>
<th>Copper Alloy Tube Production</th>
<th>Copper Alloy Tube Imports</th>
<th>Copper Alloy Tube Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>800</td>
<td>650</td>
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<tr>
<td>1998</td>
<td>800</td>
<td>730</td>
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</tr>
<tr>
<td>1999</td>
<td>800</td>
<td>616</td>
<td>0</td>
</tr>
<tr>
<td>2000</td>
<td>800</td>
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<tr>
<td>2001</td>
<td>800</td>
<td>650</td>
<td>0</td>
</tr>
<tr>
<td>2002</td>
<td>800</td>
<td>650</td>
<td>0</td>
</tr>
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</table>

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Table 9: Indian production and consumption of copper semis, 1997-2002 (tonnes)

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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Production</strong></td>
<td>339,600</td>
<td>369,700</td>
<td>410,600</td>
<td>448,200</td>
<td>493,900</td>
<td>531,600</td>
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<tr>
<td><strong>Consumption</strong></td>
<td>346,800</td>
<td>376,900</td>
<td>418,700</td>
<td>459,765</td>
<td>509,384</td>
<td>548,650</td>
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<tr>
<td><strong>Net imports</strong></td>
<td>7,200</td>
<td>7,200</td>
<td>8,103</td>
<td>11,565</td>
<td>15,484</td>
<td>17,050</td>
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<tr>
<td><strong>Wirerod Production</strong></td>
<td>156,000</td>
<td>180,400</td>
<td>215,600</td>
<td>247,500</td>
<td>287,500</td>
<td>319,500</td>
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<tr>
<td><strong>Imports</strong></td>
<td>4,000</td>
<td>4,000</td>
<td>5,108</td>
<td>7,930</td>
<td>13,407</td>
<td>15,000</td>
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<tr>
<td><strong>Exports</strong></td>
<td>500</td>
<td>500</td>
<td>594</td>
<td>821</td>
<td>1,134</td>
<td>1,100</td>
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<tr>
<td><strong>Consumption</strong></td>
<td>159,500</td>
<td>183,900</td>
<td>220,114</td>
<td>254,608</td>
<td>299,773</td>
<td>333,400</td>
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<tr>
<td><strong>Copper Sheet, Strip and Plate Production</strong></td>
<td>90,000</td>
<td>94,000</td>
<td>98,000</td>
<td>102,000</td>
<td>106,000</td>
<td>110,000</td>
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<tr>
<td><strong>Imports</strong></td>
<td>1,400</td>
<td>1,400</td>
<td>1,349</td>
<td>1,306</td>
<td>973</td>
<td>1,000</td>
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<tr>
<td><strong>Exports</strong></td>
<td>200</td>
<td>200</td>
<td>251</td>
<td>643</td>
<td>1,311</td>
<td>1,300</td>
</tr>
<tr>
<td><strong>Consumption</strong></td>
<td>91,200</td>
<td>95,200</td>
<td>99,098</td>
<td>102,663</td>
<td>105,661</td>
<td>109,700</td>
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<tr>
<td><strong>Copper Water and ACR Tube Production</strong></td>
<td>5,000</td>
<td>5,000</td>
<td>5,000</td>
<td>5,000</td>
<td>5,000</td>
<td>5,000</td>
</tr>
<tr>
<td><strong>Imports</strong></td>
<td>1,300</td>
<td>1,300</td>
<td>1,459</td>
<td>1,748</td>
<td>1,749</td>
<td>1,750</td>
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<tr>
<td><strong>Exports</strong></td>
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<td>0</td>
<td>66</td>
<td>332</td>
<td>552</td>
<td>600</td>
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<tr>
<td><strong>Consumption</strong></td>
<td>6,300</td>
<td>6,300</td>
<td>6,392</td>
<td>6,416</td>
<td>6,197</td>
<td>6,150</td>
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<tr>
<td><strong>Copper Alloy Strip Production</strong></td>
<td>38,600</td>
<td>40,300</td>
<td>42,000</td>
<td>43,700</td>
<td>45,400</td>
<td>47,100</td>
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<tr>
<td><strong>Imports</strong></td>
<td>1,800</td>
<td>1,800</td>
<td>1,769</td>
<td>2,912</td>
<td>2,827</td>
<td>2,900</td>
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<td><strong>Exports</strong></td>
<td>300</td>
<td>300</td>
<td>303</td>
<td>279</td>
<td>387</td>
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<td><strong>Consumption</strong></td>
<td>40,100</td>
<td>41,800</td>
<td>43,466</td>
<td>46,333</td>
<td>47,840</td>
<td>49,500</td>
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<tr>
<td><strong>Copper Alloy Tube Production</strong></td>
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<td>50,000</td>
<td>50,000</td>
<td>50,000</td>
<td>50,000</td>
<td>50,000</td>
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<tr>
<td><strong>Imports</strong></td>
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<td>1,000</td>
<td>905</td>
<td>1,400</td>
<td>1,181</td>
<td>1,200</td>
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<td>1,300</td>
<td>1,272</td>
<td>1,656</td>
<td>1,268</td>
<td>1,300</td>
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<tr>
<td><strong>Consumption</strong></td>
<td>49,700</td>
<td>49,700</td>
<td>49,633</td>
<td>49,744</td>
<td>49,913</td>
<td>49,900</td>
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### Table 10: Pakistani production and consumption of copper semis, 1997–2002 (tonnes)

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<tr>
<th>Year</th>
<th>Total Production</th>
<th>Consumption</th>
<th>Net imports</th>
</tr>
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<tbody>
<tr>
<td>1997</td>
<td>16,000</td>
<td>17,564</td>
<td>1,564</td>
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<td>1998</td>
<td>11,445</td>
<td>12,545</td>
<td>1,100</td>
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<td>1999</td>
<td>10,225</td>
<td>11,126</td>
<td>901</td>
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<tr>
<td>2000</td>
<td>14,025</td>
<td>14,897</td>
<td>872</td>
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<td>2001</td>
<td>14,025</td>
<td>15,843</td>
<td>1,818</td>
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<tr>
<td>2002</td>
<td>14,025</td>
<td>15,105</td>
<td>1,080</td>
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</table>

### Table 11: Saudi Arabian production and consumption of copper semis, 1997–2002 (tonnes)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Production</th>
<th>Consumption</th>
<th>Net imports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>153,900</td>
<td>200,200</td>
<td>46,300</td>
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<tr>
<td>1998</td>
<td>179,600</td>
<td>222,488</td>
<td>42,888</td>
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<tr>
<td>1999</td>
<td>164,300</td>
<td>198,507</td>
<td>34,207</td>
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<td>2000</td>
<td>179,000</td>
<td>235,258</td>
<td>56,258</td>
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<td>2001</td>
<td>172,000</td>
<td>225,300</td>
<td>53,300</td>
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<td>2002</td>
<td>167,500</td>
<td>220,800</td>
<td>53,300</td>
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#### Wirerod

<table>
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<tr>
<th>Year</th>
<th>Production</th>
<th>Imports</th>
<th>Exports</th>
<th>Consumption</th>
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<tbody>
<tr>
<td>1997</td>
<td>16,000</td>
<td>507</td>
<td>0</td>
<td>16,507</td>
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<td>14,025</td>
<td>1,460</td>
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<td>2002</td>
<td>14,025</td>
<td>600</td>
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#### Net imports of other semis

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<th>Type</th>
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<th>1998</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
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<tbody>
<tr>
<td>Cu sheet &amp; strip</td>
<td>45</td>
<td>34</td>
<td>29</td>
<td>32</td>
<td>18</td>
<td>30</td>
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<tr>
<td>Alloy sheet &amp; strip</td>
<td>144</td>
<td>113</td>
<td>268</td>
<td>216</td>
<td>82</td>
<td>100</td>
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<tr>
<td>Cu tube</td>
<td>373</td>
<td>426</td>
<td>379</td>
<td>366</td>
<td>177</td>
<td>200</td>
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<td>Alloy tube</td>
<td>495</td>
<td>318</td>
<td>183</td>
<td>178</td>
<td>81</td>
<td>150</td>
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</table>
### Table 12: Turkish production and consumption of copper semis, 1997-2002 (tonnes)

<table>
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</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>209,650</td>
<td>233,650</td>
<td>234,650</td>
<td>276,650</td>
<td>255,720</td>
<td>295,650</td>
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<td><strong>Consumption</strong></td>
<td>198,250</td>
<td>223,712</td>
<td>226,532</td>
<td>269,494</td>
<td>240,697</td>
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<td><strong>Net imports</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Wirerod</strong></td>
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<td></td>
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<td><strong>Production</strong></td>
<td>175,000</td>
<td>199,000</td>
<td>200,000</td>
<td>24,020</td>
<td>221,000</td>
<td>261,000</td>
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<tr>
<td><strong>Imports</strong></td>
<td>15,000</td>
<td>15,856</td>
<td>9,999</td>
<td>10,260</td>
<td>9,943</td>
<td>10,000</td>
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<tr>
<td><strong>Exports</strong></td>
<td>34,000</td>
<td>34,023</td>
<td>25,624</td>
<td>24,554</td>
<td>28,565</td>
<td>27,000</td>
</tr>
<tr>
<td><strong>Consumption</strong></td>
<td>156,000</td>
<td>180,833</td>
<td>184,376</td>
<td>227,706</td>
<td>202,378</td>
<td>244,000</td>
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<td><strong>Copper Sheet, Strip and Plate</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Production</strong></td>
<td>20,000</td>
<td>20,000</td>
<td>20,000</td>
<td>20,000</td>
<td>20,000</td>
<td>20,000</td>
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<tr>
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<td>2,230</td>
<td>1,544</td>
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<td><strong>Production</strong></td>
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<td>2,314</td>
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### Table 13: South East Asian production and consumption of copper semis, 1997-2002 (tonnes)

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<td><strong>Total Production</strong></td>
<td>532,200</td>
<td>375,000</td>
<td>436,719</td>
<td>471,813</td>
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<td>604,097</td>
<td>440,781</td>
<td>533,732</td>
<td>560,447</td>
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<td><strong>Net imports</strong></td>
<td>71,897</td>
<td>65,781</td>
<td>97,013</td>
<td>88,634</td>
<td>120,570</td>
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**Wirerod**

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<td><strong>Production</strong></td>
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<td>346,650</td>
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<td>13,119</td>
<td>23,589</td>
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**Copper Sheet, Strip and Plate**

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<td>20,000</td>
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<td>17,000</td>
<td>18,500</td>
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<td>30,865</td>
<td>28,140</td>
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<td>1,208</td>
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<td>2,726</td>
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<td>47,304</td>
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**Copper Water and ACR Tube**

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<td>22,487</td>
<td>21,617</td>
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**Copper Alloy Strip**

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**Copper Alloy Tube**

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<td>Alloy Tube</td>
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<tr>
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<td>69</td>
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<td>3</td>
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<tr>
<td><strong>Consumption</strong></td>
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<td>1,455</td>
<td>1,922</td>
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</tbody>
</table>

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only have 1 hour, so be sure to keep things simple and make sure you can draw out a story from the data. We have decided to focus on China and create a story around its growing demand for wire rod.

The data in Table 2 and the charts below show that China is by far the largest producer of copper semi's in the region. It produced just over half of the regional total in 1997 alone. Its share of the total production has only increased over time whereby in 2002 it was producing close to two thirds of the regional total. As a side note, South East Asia's production levels decreased over this time.
Staying in Table 2 and looking at the chart below it can be seen that China’s overall demand for Copper semis has historically been greater than production, meaning they have to import many tonnes to meet demand. This supply-demand differential gap has been rising in recent years.

In Table 3, we see that wire rod is the most prevalent copper semi being produced and consumed in China. From the graph on the next page we can see that imports of wire rod have increased 6 fold in order to meet demand within the country, whilst consumption has doubled. Exports within the graph are negligible and this is reflected in the data.

What must be happening is that China’s economy is growing so fast (evident by the growth in consumption) that businesses are having to import more and more tonnes of wire rod to meet their needs.

On a similar note ACR Tube (Air Conditioning and Refrigeration) consumption has tripled and ACR tube inputs have doubled. China also does not export any of this copper semi.
With dramatic increases in both of these copper semis, we could be led to believe that there may have been an increase in the level of construction and development in China, with buildings demanding wirerod for concrete reinforcement and ACR tube for air conditioning.

Table 4 and the chart on the next page illustrates that China originally sourced the majority of its wirerod from Taiwan, however recently South Korea, Russia and Kazakhstan have...
From this graph we could speculate that countries such as Kazakhstan and Russia have only just realised the growth potential in China for wirerod and started exporting to China on a dramatically increased scale, or perhaps certain trade barriers between these nations have finally been lifted.

Finally, looking at many of the other wirerod producing nations in the region (Tables 8-15) we can see that wirerod is in high demand but not heavily exported. This leaves the door wide open for resource rich nations in the region such as India, Australia and some of the African nations to take advantage of the Chinese wirerod demand boom and the general wirerod production shortage in the region.

In conclusion these nations just mentioned should perform further research on this topic and consider extracting the required metal ore from the earth and either shipping it over as ore, metal or finished wirerod, because with the growth boom in China, other nations in the region will be soon to follow.
Interpret and explain the following chart. In this style of case question, you are presented only with the chart below and no further information. You must be able to explain to the interviewer what may be happening within the business that this chart possibly reflects. Essentially, this type of charts based case is designed to assess your graphical analytical skills and to see how you deal with ambiguity.

Feel free to make any necessary assumptions, but ensure these assumptions are consistent with each other.
The Facts

Revenue appears to be increasing each year at an exponential rate. Expenses are also increasing but in more of a linear fashion and at a slower rate than revenue. Profit simply follows revenue and expenses, as expected since Profit = Revenue - Expenses. Because the profit and the chart indicate monetary values, we can ignore the trend line of profit.

Why is revenue forecast to increase at a greater rate than expenses?

Margins are obviously increasing each year, because the percentage gap between revenue and expenses is growing each year. This suggests that the business is experiencing economies of scale, which can be due to increased sales volumes. Visit http://www.AceTheCase.com to purchase the complete guide.
Due to yearly inflation which effects the price of inputs such as labour and materials,

Concluding, price must be forecast to increase at a faster rate than inflation.

Business Impact
This chart is the summary of an organisational forecast and we have just concluded that the business is predicting their prices to increase at a higher rate than inflation. A risk therefore exists that the market will not absorb or tolerate the planned price increases and sales volumes could fall as a result.

As a consulting firm helping this organisation, greater research and analysis into competitors pricing strategies, historical industry and market research on pricing increases in order to better predict future price increases could be conducted and presented with recommendations in a report to the organisation’s management.
Problem – Chart Interpretation 2

Interpret and explain the following chart. This question is identical to the style seen in the previous question. We present this simply as another example and the possible solution will be structured in the same way.

Possible Solution – Chart Interpretation 2

The Facts

This is a historical view of an organisation's monthly sales volume from the last 3 years. Looking at equivalent months (e.g. start with January) it can be seen that sales have been increasing each year. A heavy seasonality pattern exists with sales dropping by around 30% in June, July and August.

Questions

Why does this business suffer from large seasonal swings in sales volume?
Possible Solution – Chart Interpretation 2 (Continued)

What kind of business is this and what hemisphere is this business in? This will help to understand the seasonal sales volumes and to determine if it is a drop due to summer weather or a drop due to winter or neither.

Discussion & Analysis

This organisation may be heavily affected by the weather or similar seasonality affects such as sporting seasons or school terms.

If we were to assume that this business is a growing travel company operating in the southern hemisphere specialising in sunny island holidays in the Pacific Ocean. Then we could explain the sales drop as the result of the weather getting cooler.

If we were to assume that this business is a sporting goods supplier for which the specific sport for which it supplies equipment and apparel has its off season between June and August, then we could explain the sales drop as a result of this.

Whatever the cause of the seasonal sales volumes, cash flow management must be a key issue for this business.

If cash flow management is an issue for this organisation then a strategy of ‘seasonal diversification’ to offset the seasonal impact may be appropriate. E.g. the sporting goods company begins selling sporting goods for a sport which is played in the off season of its primary sports market. E.g. the southern hemisphere travel company moves into selling ski holidays to boost cash flow in the winter months.

Business Impact

Seasonal sales volumes no matter what the cause places stress on cash within an organisation. During the low season, financing is often required to meet short term obligations to suppliers and employees, which is usually comfortably repaid with cash during the boom time.

The constant challenge however, still persists and unnecessary interest payments and negotiations with lenders can place a drain on management. As a consulting firm assisting this organisation, a strategy to smooth this seasonality effect, tailored towards the operating environment of the client could be designed after thorough analysis of the business and its opportunities.

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Problem – Chart Interpretation 3

Interpret and explain the following chart

This question is identical to the styles seen in the previous questions. We present this simply as another example and the possible solution will be structured in the same way.

Possible Solution – Chart Interpretation 3

The Facts

This chart shows the average daily weight of what could be a manufactured product, probably one coming off a production line. There appears to be defined limits, probably for quality control purposes. The average weight has started to breach the upper limit more and more frequently in the last 90 days and has become somewhat more erratic.

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Possible Solution – Chart Interpretation 3 (Continued)

Questions

Why has the manufacturing process started fluctuating so badly such that the average weight varies so much daily?

Why has the average daily weight started to regularly exceed the acceptable high side limit of 102 grams?

Why was corrective action not taken at the first sign of a breach in the quality control limits?

Discussion & Analysis

A process can start to fluctuate for many reasons. Machinery could be wearing down and need replacing, staff may be tired and overworked, new staff may not have been adequately trained in quality control, input materials may not be consistent, or there could be general problems with the process itself for example the sequence and timing assigned to each sub process or event.

There appears to be a trend in the data, i.e. the average weight is regularly breaching the upper acceptable limit, which would lead us to believe that it may be something simple like a faulty piece of equipment which is over allocating the inputs to the end product. E.g. too much of some type of component or ingredient is being added.

The erratic behaviour of the trend line however, indicates that it is more than just old machinery and could in fact be a combination of things.

Business Impact

In terms of the business impact, this is a quality issue which by nature has multiple ramifications. First, it is wasteful and costly because the consumer is in effect, getting more than they have paid for when the weight is higher than the specifications, and hence margins are eroded. Secondly large inconsistencies in weight make the product and organisation look incapable as their output is not standardised, this impacts reputation.

Finally since this is a process control issue the business needs to ensure this does not happen again both with this product and others they may manufacture. This can be achieved through creating new processes and procedures and ensuring they are followed by employees in charge of monitoring and quality control.

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As a consulting firm working with this organisation, the first thing to do would be to address the current situation and determine the root cause/s of the product weight inconsistencies.

Secondly a full analysis of and changes to internal processes would be required to ensure that product quality is maintained across the organisation.

That concludes this section on data and charts based cases. We hope we have provided you with some insight into answering this style of question should you come across it during the management consulting interview process. On the next page you'll find additional data and charts based questions to try yourself. Good luck!

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That concludes the worked solutions for data & chart based case questions. Here are more examples of this style of case interview question for you to attempt and practice on your own.

Other Data & Chart Based Cases

- Analyse and explain what the following chart could represent.

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5. Logic Problem Cases

Logic problems are not uncommon when it comes to management consulting interviews. They are not a case based question as such but have been known to be asked. Since most management consulting firms put you through 2–3 rounds of case-based interviews, there is a chance you will encounter a logic problem perhaps in the final round interview just to test you in a slightly different way than your ability to analyze quantitative data.

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Please note that the recruit is looking for technical expertise in quantitative data analysis. Such people will be required to use this expertise to analyze customer behavior and devise new strategies for client organizations. Logic problems like those in this section help you test all of this.

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Other logic problems are different and simply require creative and interesting answers to impress the interviewer. Other logic problems are different and simply require creative and interesting answers to impress the interviewer.

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At first, this question appears daunting. How are you to know the circumference of the Earth? What’s it’s diameter for a start? If you

Ignoring the impact of mountains, land and oceans on the Earth’s surface, the Earth is close

If the rope sits flush on the equator its length is therefore $2\pi r$, where $r = $ radius of the earth

So, \( \frac{(2\pi r + 600m)}{2\pi} \) will yield your answer
Solving this equation you get the height above ground as:

\[ \frac{2\pi r}{2\pi} + \frac{600}{2\pi} - r = \frac{600}{2\times3.14} = \approx 100 \text{m} \]
Problem – Crossing the Canyon

It's night time, and a team of four explorers, who are in a competition against other teams, have to get across a canyon using a very narrow bridge made of rope and wooded planks. This rope bridge can only hold a maximum of two people at any one time and because it is dark, a torch must be carried by someone crossing the bridge otherwise they could lose their footing and fall to their death!

There is only one torch however, and explorers are of different experience, age, and fitness level. Person A takes 1 minute to cross, Person B, 2 minutes, Person C, 3 minutes, and lastly, Person D, 10 minutes. Naturally, when two people cross the bridge together, they must go at the speed of the slowest. All four people need to get across in exactly 17 minutes. How will this be done?

Like most logic problems this question is somewhat unrealistic, but the problem tests how fast you can come up with plausible solutions to a "life or death" situation. It takes a mix of numerical ability and creativity in order to come up with an elegant solution.

Possible Solution – Crossing the Canyon

The first thing to note is that the goal is to get everyone across the canyon in just 17 minutes. Therefore, it's rational to assume that the two slowest people should cross together otherwise a lot of time would be wasted having them cross separately. However, another dilemma exists. Once we get them both across, we do need to make one of them walk back with the flashlight. To solve this, we should instead have one of the faster people already there waiting to sprint the flashlight back across.
Let the four persons be A, B, C, and D with following crossing times:

- Person A: 1 minute
- Person B: 2 minutes
- Person C: 5 minutes
- Person D: 10 minutes

And after some inevitable trial and error rearranging the order the solution is as follows:

1. Persons A and B cross the bridge (2 mins)
2. Person B comes back with the torch (2 mins)
3. Persons C and D cross the bridge (10 mins)
4. Person A comes back for Person B carrying torch (1 min)
5. Persons A and B cross the bridge (2 mins)

Total time taken (cumulative): 17 minutes
Problem – Red Wine, White Wine

You have a 90L barrel of white wine and an equal sized barrel of red wine. You take a ladle of red wine and put it into the white wine and they mix perfectly. You then take a ladle of the mixture and put it into the red wine. Assume no spillage occurs. After completing the exercise you are asked: ‘Is there now more red wine in the white wine than there is white wine in the red wine?’

First we must understand the question. Forget that no one in their right mind would go mixing red and white wine together, but let’s remember it’s an abstract logic problem. Basically it is asking, is there more red wine polluting the white wine barrel compared to the amount of white wine polluting the red wine barrel.

Possible Solution – Red Wine, White Wine

Answering this problem can be done in two ways. First you could say okay let the ladle be 10L, and perform some basic calculations.

10L of red wine goes into the 90L white wine barrel

There is now 100L of wine in the white barrel in a ratio of 1:9, or one tenth red.

Taking a 10L ladle of the mixture in the same ratio results in 9L of white and 1L of red sitting in the ladle.

This means that there is now 10-1 = 9L of red wine left in the white wine barrel.

Pouring this ladle into the red wine results in 9L of white wine ending up in the red wine barrel which is the same as the amount of red wine left in the white wine barrel.

Therefore the answer is “no, it’s the same.”
This is a good enough answer but you interviewer may ask, “well what if the ladle was a different size?” or even the barrel? You could go on performing the same calculations using different sized ladles and barrels and get the same answer to better demonstrate your logic ability, or you can assign the ladle to be some variable, e.g. $\alpha$ and the barrel size $\beta$. Now you can perform similar calculations using algebra.

Since a ladle is of size $\alpha$, the actual ladle contains $\alpha \times (\alpha / \beta + \alpha) = \alpha^2 / \beta + \alpha$ litres of red wine.

This method of using a variable is a bit more involved but clearly demonstrates your ability to use mathematical ratios.
Problem – Industries in Space

As aside from what already exists, what will be the next three industries operating in space and why?

This question involves more of an exploration of the issues as well as using logic and creativity. Here there is no right or wrong answer, rather the interviewer wants to see your potential for creative thought as well as commercial judgement.

Possible Solution – Industries in Space

Among the many possible industries or business models people have explained at interviews, here are just a few that we liked:

Holiday/Travel Industry

Civilian travel into space has a huge potential with many people dreaming of going into space, feeling weightless and viewing the earth from afar. Such an industry would probably grow much like the terrestrial transport based advances we have already seen throughout history. With the advent of airborne flight speeding up travel and opening up new destinations space travel should do the same. Like aeroplane jet travel once was, space holidays would start off only for the very rich as costs would be huge for the operating companies. You may be able to only be in space for a few hours before returning to earth or perhaps extended stays may be possible by visiting special tourist space stations, setup like luxurious hotels.

Construction

In line with this idea another early industry which may operate in space will be construction. Large construction or specialist aeronautical companies may soon be offered contracts to build such things as hotels in space. Much of the construction can take place on earth with simple assembly teams required to get the modularised sections of building into space and connected together.
Sony and Toyota may soon create giant advertising, billboard-like objects which can orbit the earth displaying their brand name. We already see sky writers create advertising, and this would take it to the next level. Costs would be huge and hence why only extremely large companies could justify such an expense. Such a billboard would obviously need to be huge, in the order of 100's of football fields in area, but if it could be built in such a way that it was made out of lightweight materials and collapsible or compacted enough that it could go up in conventional space craft then a possibility may exist to get the thing constructed and orbiting with only 2 or 3 manned space flights.

A lower cost option may be to design some special kind of solar powered projector device that can be triggered to shine a mirrored image onto clouds so that we could read it on earth the other way round.

Minerals on other planets may be useful for medicines, construction purposes, forging existing and new alloys or to substitute our dwindling supply. Such an industry would take a long time to establish since initial costs would be huge in terms of machinery, transportation and processing. If mining and processing were robotic and conducted on foreign planets and moons within our solar system. In fact you can already purchase land on the moon, but how legitimate these deeds are at this time is an interesting question. United Nations restrictions and Government regulations may hold back this industry at this time, however this line of business would be relatively low cost, and demand potentially high.
Possible Solution – Industries in Space (Continued)

Telecommunications

 Already in existence in the form of satellites, telecommunications is built for space since data can travel with ease via radio and microwaves. Special repeater and amplifier receiver/transmitter stations may be built in space as satellites, or fixed to planets and moons to allow for more efficient and longer distance communication in space without the need for an initial powerful transmission signal.

Funeral Services

 This is an interesting idea where the family or the deceased may directly request to have their ashes released in space, or alternatively sent out on a continual journey through space. This business would be relatively low cost as the funeral service and cremation could be held on earth and then hundreds of urns could be taken to space in one single voyage and each is released as the space vehicle orbits the earth before returning to earth.

Private Investigators

 Using current or new satellites and special cameras with powerful zooms and or thermodetection, private investigators could utilise this technology to track a person’s whereabouts and daily movements for a client, all from the comfort of his/her computer. Privacy and Spying laws may be an issue here and would need to be researched.

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Problem – Soda Cans

Why are soda cans concave at the bottom?

This question is short and sweet (pardon the pun), getting you to think on your toes, use some common sense and logic to think about product design. An Engineer would probably answer this better than a business student but

Possible Solution – Soda Cans

Smoothly curved surfaces are actually stronger than a flat surface of identical diameter. This strength in design prevents the pressurised, carbonated soda from forcing the can out of shape.

As an aside, this concept also describes why European castles went from being built with straight linear walls and rectangular prism shaped buildings and towers to rounded, cylindrical structures to better withstand the force of enemy cannons or catapult fire.

Additional reasons could be to hide volume and give the appearance of more liquid. Also maybe it makes them stack easier, however that’s probably what the grooved lid and ridged circumference is for on the bottom.
Does the sun always rise in the east?

This is yet another short brain teaser to test your ability to think outside the box.

Possible Solution – Sunrise

The answer is no, because at the exact point of the North Pole there is no such thing as east or west because everything is south. The same can be said for the South Pole in which all directions are north.

In addition you may want to say that in the far northern winter and southern summer the sun doesn’t rise at all. To be even more clever, you could explain that the magnetic polarity of earth changes every million or so years so that north actually becomes south and therefore east would become west.

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Section 5: Logic Problem Cases

Problem – Buckets

You have a 3 litre bucket and a 5 litre bucket. How will you measure out exactly 4 litres of water? Assume you have an endless supply of water and no markings on the buckets.

This is a question you may have seen before and in fact it appeared in one of the 'Die Hard' movies. It requires a bit of thinking but the answer is relatively straightforward. There are actually two ways of measuring out the 4L exactly so see if you can solve it the other way.

Possible Solution – Buckets

First fill the 3L bucket and pour all of its contents into the 5L bucket. You now have 3L of water in a 5L bucket and therefore 2L of empty space.

Now fill the 3L bucket and pour as much as you can into the 5L bucket (i.e. 2L). This leaves 1L in the 3L bucket.

Empty the 5L bucket and pour in the 1L of water you have sitting in the 3L bucket.

Now fill the 3L bucket to the top and pour it into the 5L bucket and you are done. 1L + 3L = 4L measured out exactly in the 5L bucket.

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Why are manhole covers round?

You may be given some time to think about this question but like most logic puzzles the answer is pretty simple.

Possible Solution – Manholes

Round lids or covers cannot fall into the hole they are covering. A square or rectangle cover would fall in if angled correctly, i.e. on the hypotenuse or diagonal of the square whole. A round lid cannot fall through a round hole no matter what angle you put it on. Therefore to avoid losing the lid down the hole, manhole covers have been designed to be circular.
Problem – Clock

In a 24 hour day how many times do the hands of a clock overlap?

Don’t rush these types of questions, as they are designed for fools to rush in with the wrong response. Think carefully and don’t be afraid to get out the pen and paper. When you have your final answer, speak it confidently.

Possible Solution – Clock

The actual answer will vary depending if you count 12:00am once or twice. I.e. at the start and then at the end for midnight.

Most people will assume the answer is 24 times, however if you take the time to think about it and work it out in your head or on paper the answer is actually 22. If you make the assumption above it then becomes 23.

The reason for 22 is that yes the hands overlap once every hour and then in the 10th and 22nd hour you see the hands overlap right at the end of the hour at roughly 10:54, but they don’t overlap again until 12:00 noon. Therefore the hands never overlap in the 11th or 23rd hour. Hence the answer is 24 – 2 = 22.

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Problem – Clock 2

How many degrees are there between the hour hand and the minute hand on a clock face when the time is ten past two?

We’ve helped you out by placing a graphic of the clock to the left. If you encounter such a question, do sketch something on paper to get your brain working. At its core this is just a simple maths problem.

Possible Solution – Clock 2

Another annoying clock question is what you are thinking. And yes, we agree. Most people jump out and say zero as their answer, believing that the two hands are overlapping at this time. This assumption is obviously wrong. At 2:10, the minute hand is exactly on the 2 indicating 10 minutes out of the hour. The hour hand, however, is just past the 2 but sitting just before the first notch and is exactly 1/6 of the way between the 2 and the 3.

Between each numbered hour there is 360/12 = 30 degrees. 1/6 x 30 degrees = 5 degrees.

Hence the answer is 5 degrees.
You have eight Billiard balls. One is defective, meaning that it weighs more than the others. How would you find it, using a balance, if you were allowed to use the balance only twice?

This is quite a difficult logic puzzle and requires some thinking. Sure enough it is easily solved using the balance three times, i.e. if you compare 4 against each other, find the heavy side, then split them and compare two against each other, and then find the heavy side and compare one against another, but you are allowed only to go.

Possible Solution – Billiard Balls

To solve it using the balance only twice you must, pick any three balls and weigh them against any another three balls. If the scales balance then one of the remaining two balls is defective so put one in either side of the balance and the heavier one is the defective ball.

If the starting three balls don't balance then take the three balls from the heavy side and pick two of them to compare against each other on the balance. If they balance the third is defective and if they don't then the heavy ball is defective.

A simple enough answer but difficult to deduce in an interview situation.
Weighing an A380

How do you weigh a jumbo jet without any scales?

This is yet another rather abstract question which could be solved in a number of ways. However, the interviewer just wants to see what creative yet practical solutions you may come up with. Below are some suggestions.

Possible Solution – Weighing an A380

Put it on a big boat. (E.g. a container ship or aircraft carrier) and mark the water line on the hull. Now take it off the boat and add known weights onto the deck until the boat sinks to that water line again. Add the weights up and there is your weight of the jumbo jet.

Use a big electro magnet placed above the aircraft and by utilizing some magnetic attraction formula from the world of physics which includes mass and magnetic force you should be able to work out the weight. When the aircraft lifts off the ground determine the magnetic force being exerted and thus calculate the mass of the plane. Note this may not work because the fuselage is probably not designed to take the weight of the plane when lifted directly from above by a giant electro magnet. You may also have trouble finding an electro magnet of adequate strength and size and don’t forget that aircraft are made of aluminium not iron. Given all of this, the first option is probably better.

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Problem – Candy

You have a large bucket full of pieces of candy in only three distinct colours: Red ones, blue ones and green ones. If you are blindfolded, how many pieces do you have to take out, to be sure of getting a matching pair?

This is a simple exercise in probability and getting it wrong means you learnt nothing back in high school. This type of question should be answered quickly and should not require you to think for more than about 30 seconds. It may be thrown at you in addition to a case question or another logic problem.

Possible Solution – Candy

The correct answer is 4. After taking out three pieces you may have a matching colour pair already, but you may also have only one of each colour. Taking a fourth guarantees you that one will match up with the coloured candy piece just selected.

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That concludes the worked solutions for logic problem case questions. Here are more examples of this style of case interview question for you to attempt and practice on your own.

Other Logic Problem Cases
- You have 120 seconds to come up with 10 uses for a paper clip
- A lily pad growing in a pond doubles in size every day. After 28 days it covers the pond. If there were two of these lily pads in the pond, after how many days would the pond be covered?
- How would you invest 1 million dollars?
- Three people check into a hotel. They pay $30 to the manager and go to their room. The manager finds out that the room rate is $25 and gives $5 to the bellboy to return to them. On the way to the room the bellboy reasons that $5 would be difficult to share among three people so he pockets $2 and gives $1 to each person. Now each person paid $10 and got back $1. So they paid $9 each, totalling $27. The bellboy has $2, totalling $29. Where is the remaining dollar?
- A man lives in a small house with a farm and his back garden and has a river beside his house. On the other side of the river is a shop. One day he visited the shop. He bought a chicken and a fox for his farm and bought a bag of corn to feed the chicken on. The man can only take one thing and himself across in the boat at any one time. Without killing any animals or letting another animal eat an item or animal, how will the man get across?
- You are in a room with three light switches. Each switch controls one of three light bulbs in the next room. You have no way of seeing into the next room unless you walk out and around via a corridor. You must determine which switch controls which light bulb. All lights are off. You may flick only two switches and enter the room with the light bulbs only once. How would you determine which switch controls which light bulb?
- How would you design a spice rack for a blind person?
- Join all of these 9 dots together with only 4 straight lines.

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Section 6: Candidate Case Interview Narratives

6. Candidate Case Interview Narratives

So far we have presented many real life case questions and given you a possible solution in a very structured way using text and diagrams. In this last section of the guide, we wish to tie everything together and present a sample of case interview transcripts, or narratives as we prefer to call them. Each narrative on the following pages is based on the actual transcripts of real life case interviews. We hope that these consulting case interview narratives give you a better indication of how a real case interview may unfold and to demonstrate how the analysis could flow.

Narrative 1 – A Brain Teaser

After some brief ‘getting to know you’ style questions such as, “what was your favourite course at university?”, the interviewer launched into a brain teaser style case question.

Interviewer: So… let’s see if you like puzzles.

Candidate: Sure.

Interviewer: Suppose there is a round chocolate cake, out of which somebody has taken a slice. The remaining cake has to be divided equally amongst two boys by a blind man. He has nothing except a cutting device. How would you do it?

Candidate: Ok. Give me a moment to think over this.

Interviewer: Yeah, sure.

Candidate: Ok, tell me one thing, is the cake flexible enough to be folded?

Interviewer: Yes, you can assume that.

Candidate: So, in that case the blind man can fold the cake right from the inside edge of the slice. The remaining cake has to be divided equally amongst two boys by a blind man. He has nothing except a cutting device. How would you do it?

Candidate: So, in that case the blind man can fold the cake right from the inside edge of the
Candidate: Then we can try one other thing. Can I assume that the cutting device is a knife?

Interviewer: Yes.

Candidate: And the knife is longer than the diameter of the cake?

Interviewer: Yes. What do you have in mind?

Candidate: Well...the blind man can sense the shape of the slice taken, and place the knife horizontally on the cake with one end touching the midpoint of the empty slot of the slice taken, in such a way, that it covers the maximum area of the cake. There will be high chance of that chord being the diameter of the cake. He can cut the cake into half on that line.

Interviewer: But that is just an approximation.

Candidate: True, but it will be very near to the exact half.

Interviewer: Yes, you are right. But can you think of any other way of cutting it?

Candidate: (After thinking a while) No.

Interviewer: Let me give you my solution to this. The blind man can cut the cake vertically instead of cutting it horizontally. In that way, each of the boys will get half of the sliced away portion.

Candidate: But that is also an approximation I guess. How can a blind man know where is exactly half the height of the cake is?

Interviewer: See... there can be number of answers to this case. This is just an example of lateral thinking to the problem.

Candidate: Yes, but...ok, that is nice.
The candidate did not argue further with the interviewer, although she was not satisfied by his answer.

**Candidate:** I have just thought of a more accurate way to divide the cake.

**Interviewer:** Ok, I’m listening.

**Candidate:** Well… since the blind man has a knife which is larger than the actual cake, he could balance the cake on top of the knife blade, until it balances perfectly. He will need good judgement to do this and it can be done by touch alone. He may however, need the two boys’ help to do this task. At this point of balance he knows that on each side the blade the cake has equal weight and hence is an equal portion. He can then push the cake down over the blade to get two equal halves for the boys.

**Interviewer:** Now that’s another good idea, well done!
Interviewer: Let me now ask you one case study.

Candidate: Ok

Interviewer: There is an electric tower manufacturer in India, who manufactures steel towers via which electricity is transferred from one place to another. For example, the electricity which you are consuming in Mumbai might have come from Himachal Pradesh. The annual sales of the manufacturer are INR 1,000 million, and they want to increase sales up to INR 3,000 million in a span of 3 years. How can they do this?

Candidate: Let me make sure that I understand the whole problem. There is a steel tower manufacturer whose annual sales are INR 1,000 million, which he wants to increase up to a level of INR 3,000 million in three years. We have to suggest to him a game plan to achieve this. Are there any other objectives?

Interviewer: You are right. No, there are no other objectives.

Candidate: Just give me a few seconds to jot down my thoughts.

Interviewer: Sure

Candidate: Ok. I would go with the following framework:

- Get the overview of the steel tower industry, its growth rates, existing competition, and barriers to entry, etc.
- Get an overview of the prevailing pricing environment and any expected changes therein, if any.
- Identify potential industry verticals or geographies where the market for steel towers is under penetrated/un-organised.
- Assess capabilities of the company in terms of manufacturing, marketing and sales expertise, both domestically and internationally. Also check the financial position of the company if additional funds are available.
Narrative 2 – A Business Case (Continued)

Interviewer: Ok. So go ahead with your strategy.

Candidate: Fine. So first of all, can you tell me how big the steel tower industry is in India and what is the market share of the company?

Interviewer:

Industry Overview

Company is the most dominant player in the industry with 20% market share. There are eight other players in the market. Our client has a dominant position in the market because it is the oldest player (operating since last 20 years). There is no technology involved in building a steel tower, but heavy initial investment required has limited the number of players to a handful. The industry is pretty mature and growing at a nominal annual CAGR of 10%.

Pricing Overview

The pricing of all the players in the industry are same. Nothing can be done regarding the price change. All players operate on the same margin level.

Potential Expansion

The company has its revenue breakup as – 60% from India, 40% from North Africa. (Here comes some crucial information). The industry in North Africa is growing at a moderate rate of 10-12% CAGR. Company enjoys a 25% market share in that industry.

Capabilities

Company is already running at its fullest capacity at three of its manufacturing locations in India, which are widely dispersed over the country. If any additional demand comes, company gets that manufactured from other suppliers (which have excess capacity) on an outsourcing basis. It has all the manufacturing expertise needed. It also has access to debt and capital markets from where it can raise additional funds, if needed. And since company...
sales of this company after three years, assuming the growth rates mentioned for the North African and Indian industry, and assuming that its market share will remain intact, if not increase.

**India**

Total market now is \((1,000 \times 60\%/20\%)\) around INR 3,000 million. At a CAGR of 10%, it will reach around INR 4,000 million in 2009. So company's share out of it = 4,000 x 20% = INR 800 million.

**North Africa**

Total market now is \((1,000 \times 40\%/25\%)\) around INR 1,600 million. At a CAGR of 12%, it will reach around INR 2,200 million in 2009. So company's share out of it = 2,200 x 25% = INR 550 million.

That makes a total of INR 1,350 million in 2009 (3 years' time). Now tell me is company willing to expand to other geographies?

**Interviewer:** It is you who have to advise the company.

**Candidate:** OK. Tell me how is the market for steel towers in the Americas, Europe, and APAC?

**Interviewer:** Americas have no potential. It's already a saturated market. APAC has a big market but the customers (electricity suppliers) prefer Malaysian distributors there. So you have no chance of expansion there. Europe also is an emerging market, with current sales in line with those in North Africa (i.e. 1,600 million). Actually there have been recent bombings there and many of the towers have been damaged or destroyed, and are being rebuilt.
Narrative 2 – A Business Case (Continued)

Interviewer: Yes. Company has been outsourcing its manufacturing to Indian as well as international suppliers.

Candidate: Oh great. By getting it manufactured somewhere near to Europe, the company can save on transportation costs from India to Europe allowing them to keep margins from getting too small. Are there any government regulations or any other inhibitors to the entry such as pricing?

Interviewer: There are no government regulations. Pricing is almost same globally, with the same margins.

Candidate: OK. So I can assume that the company will be able to get 50% market share of the industry in Europe in 3 years, as there are no local players operating and the industry is under penetrated?

Interviewer: That is too high (given it has gained just 20% in India in 20 years).

Candidate: OK, then I would revise that to 15%. Should that be fine?

Interviewer: That’s more realistic, yes.

Candidate: And how is the growth rate in Europe?

Interviewer: It will be around 20% annually.

Candidate: So company’s share from Europe - Total market now is INR 1,600 million. At a CAGR of 20%, it will reach around INR 2,800 million in 2009. So company’s share out of it = 2,800 x 15% = around INR 400 million.

That makes the total revenues of company in 2009 to be 1,750 million (India + Africa + Europe). This is still well short of the 3,000 million target, so we need additional options rather than just international expansion. Perhaps some kind of diversification strategy?

Now a thought has just struck my mind. I am going to want to research on the business of...
business growing in North America, where companies are doing billions of dollars business
by just leasing sites and towers to cellular telecommunications operators. Can you help me

Candidate: So in 3 years, this market is going to touch around 10,000 million. If we take a
conservative view, I think we’d like to say we gain in just 10% share in the market.

Interviewer: Yes

Candidate: In summary, I would advise the company, first to make an entry into the
European markets where it can rapidly gain market share, taking INR 400 million into its
annual revenues in 2009. It should also consider expanding horizontally into the
manufacturing/leasing of towers for mobile service operators, and monetize the growing
telecommunications market in India and North Africa. Leveraging its strong brand name
and positioning in these two markets, our client can easily gain somewhere around INR 1200-
1500 million of annual revenues in 2009. Adding to this, the normal revenue contribution
coming from electricity towers in India and North Africa, our client can easily ramp up its
sales to INR 3,000 million in 2009. Actually it can also go ahead of the target by following
Narrative 3 – A Logical Problem

This is an example of how a case interview can be rushed, if you do not take the time to explore the issues before making assumptions about the problem. Think about how you could have answered this question better and what answer the interviewer was looking for.

**Interviewer:** There is a wheat packing machine with a big hole at the top of it, wherein

**Candidate:** What is the packing speed of the machine?

**Interviewer:** There is no constraint on the speed of the machine. It can pack wheat into wheat bags infinitely fast.

**Candidate:** Is there any constraint in terms of number of poly-bags available?

**Interviewer:** No

**Candidate:** What is the maximum speed at which a donkey can move?

**Interviewer:** We have infinite number of donkeys who can run at an infinitely fast speed.

**Candidate:** What is the demand of our wheat in the market?

**Interviewer:** How is that relevant?

**Candidate:** To reduce our inventory costs, we should not just stack up wheat bags. Meaning thereby, we should not produce more than what we can sell. By doing that, we can minimize our storage costs.

**Interviewer:** But I never said if that was our objective. We can pack the wheat and stock it in our storehouse.

**Candidate:** But there is no logic in that. What is the need of producing in excess of demand?
Narrative 3 – A Logic Problem (Continued)

Interviewer: Ok. For a moment let us say that our objective is to minimize our inventory cost. Then what is your final answer?

Candidate: In that case, we should scour through our sales data and customer records to identify the potential demand for wheat in the market, and should rationalize our packing of

Visit http://www.AceTheCase.com to purchase the complete guide
The current sales incentive policy is as follows:

- The minimum guaranteed salary for a salesperson is Rs. 6,000,000.
- The average salary of a salesperson is Rs. 10,000. This is the salary which one gets if he meets his annual sales target. Meeting the annual sales target means the achievement of 80% to 100% of target.
- If the actual sales fall below 80% of the annual target, the salary drawn by the salesperson is Rs. 8,000,000.
- If the salesperson beats the target by more than 10%, he earns Rs. 12,000.

**Interviewer:** That is a good question. The company manufactures four types of refrigerators. Their respective sales price and profit margin (post S, G & A expenses) is as follows:

<table>
<thead>
<tr>
<th>Product</th>
<th>Sales Price</th>
<th>Profit Margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Rs. 8,000</td>
<td>15%</td>
</tr>
<tr>
<td>B</td>
<td>Rs. 10,000</td>
<td>14%</td>
</tr>
<tr>
<td>C</td>
<td>Rs. 15,000</td>
<td>10%</td>
</tr>
<tr>
<td>D</td>
<td>Rs. 5,000</td>
<td>20%</td>
</tr>
</tbody>
</table>

**Candidate:** After analysing the above data, I would observe that there is a flaw in the current sales incentive policy of the company. The company is currently giving uniform incentives on all of its products, although they entail different selling prices and profit margins. Company should rationalise its incentive policy to suit its interests.
Interviewer: That is an irrelevant question.

Interviewer: OK, go ahead.

Candidate: The company should focus on the sales of product D, because it enjoys the highest operating margin. Currently what the company is doing is rewarding more to its sales representatives for selling refrigerator C (since it has highest sale price), but which has lowest operating margin. Focussing on the sales of product D will result in higher Return on Investment (ROI) and will enhance shareholder value.

Interviewer: But the company is making highest profit on product C in terms of absolute Rupee amount. Shouldn’t the company focus on higher absolute profits instead of higher profit margin?

Candidate: No. The company should always focus on higher operating margin instead of higher absolute profits. In the current case, higher profits by selling product C will come on the base higher invested capital (as it has higher cost of production), which will more than offset the incremental absolute profits. So, if the company wants to increase its shareholder value, it should push for the sales of product D instead of product C.

Interviewer: That is a good conclusion. Thank you.
In this case interview question, the participant did not have any accounting, finance or economic background. They were a science student. You will see that to do well in a case interview, you don’t need to have all of the necessary knowledge and techniques, but instead ask the right questions by following the interviewer’s lead.

Interviewer: Let’s try a business case. We once had a client, a small ice cream shop, which was not making a profit. It was located in a shopping centre, near the food court. This ice cream shop was just a typical shop with a counter and it served ice cream, sundaes, shakes and soft drinks. It had 4 employees: a cashier, two serving people, and a cleaner. It was part of a franchise. The franchise supplied all of the goods, like ice cream, cones, spoons, napkins, etc.

Candidate: I see, so we need to know why it’s not making any profit. Is there a particular segment of the ice cream shop where you want me to start my assessment from?

Interviewer: Nothing in particular, but it would be great if you will start by telling me how the income is derived in the ice cream shop.

Candidate: Okay, first I will discuss revenue and cost. Revenue would come from the sales of the goods sold in the ice cream shop, like sundaes, shakes, soft drinks, and of course, ice cream. Cost will then primarily come from the salary of employees and rent of the shop. Added to that, there are also costs from materials needed in the shop like napkins and spoons.

Interviewer: Right. But let me also add the franchise fee that they pay monthly and the maintenance costs of their machines.

Candidate: Oh, that’s right. Going forward, do you have any numerical information regarding their costs and revenues?

Interviewer: Yes, total sales typically reach 500 units sold per month at $5/sale average.

Candidate: Okay, so that’s $25,000 in monthly revenue.

Interviewer: Right. On the cost side, there’s $15,000 for wages, $10,000 for rent, $10,000 franchise fee, and $1,500 maintenance cost per month.
Canidate: That would be around $36,500 for cost. There would be no profit at all. The ice cream shop is losing $11,500 every month!

Interviewer: Precisely. And also, the cost of goods sold is half of the revenue. So that would be an additional $12,500 negative incomes. Well, then, how can you increase the profits?

Canidate: We can attack the problem from different perspectives. First, I would start looking at increasing revenue. How about promoting aggressively the items sold in the ice cream shop?

Interviewer: It can be done. However, the franchise is the one providing the price list and posters.

Canidate: I see, how about taking a look at the product itself? Maybe we can advise the ice cream shop to sell the flavour with the highest demand?

Interviewer: That can also be observed. Unfortunately, the flavours are rotated on a monthly basis. The milk shake though, is average, and can be improved.

Canidate: Is it the only ice cream shop in the area?

Interviewer: Yes, it’s the only ice cream shop near the food court.

Canidate: In terms of margin, do we have information?

Interviewer: We have found out from their sales data that ice cream and soft drinks have the lowest and highest margins, respectively. Sundaes and milkshakes have good margins.

Canidate: How about cutting cost? Like reducing the number of staff? Perhaps they can multitask, like the cashier can do cleaning? There might also be downtime during the day when they would need not much staffing?

Interviewer: That can be done, I think. Good.

Canidate: Thanks. I assume rent is fixed so we can’t do anything about it. How about maintenance issues?
Can: I think I have all that I need. I can probably lay down my findings to you.

Interviewer: Okay, but how about looking at the cost of goods that they are selling?

Can: Oh! I've overlooked that one. But, the supplier is the franchisor, right? Is it a premium brand and would there be other suppliers around?

Interviewer: Yes, it is a premium brand. We have to wait until the contract expires to look for a new one.

Can: I see. So, to summarize: I have the following approach:

**Revenue**
- Increase the ice cream shop's promotions. Let's put the high margin items like soft drinks as the most visible among the goods sold. We are sure to increase revenue from this as the ice cream shop is unique within the vicinity.

**Cost**
- I would check to see if it is possible for the employees to multitask, and possibly, have one less person during downtime shifts. The milkshake machine needs to be replaced again. I know it’s a high time cost, but the benefits would be felt in the long run, as we have less maintenance cost and higher milkshake revenue due to the machine being more available. And also, like what you have mentioned, we can change where raw materials such as ice cream, milk, flavouring etc. are sourced from once the existing contract expires.

Interviewer: Very well said. I am happy with the recommendations. For someone without a firm background on finance, you seemed to follow what I was leading you to. Actually, there are also other approaches and suggestions to the ice cream shop. We would first look at the competition and the price. Since there are no other shops like that around the area, we can increase the prices by as much as 8-10%. This would greatly complement the promotions approach that you mentioned.

Can: I greatly agree. That’s a very good and valid plan. How about the cost side?

Interviewer: For cost, we looked at employee training. There might be some lapses in procedures that hinder profit. Maybe someone keeps on breaking the milkshake machine due to improper usage. We can also change the suppliers after the contract expires. Do you have any considerations when changing suppliers?
Canidate: I am just thinking of how the prices differ between suppliers and how long the contract is.

Interviewer: Those are valid points. You also need to consider the added costs, like if the new contract would demand a manager onsite to deal with daily tasks. And also these recommendations should always be in the long term as we cannot realise the effects of profit methodologies without testing it for months.

Canidate: I very much agree. I think most of my recommendations are for the long run.

Interviewer: Right! I think we are good. Thanks and good luck!

Canidate: Thanks! I enjoyed this interesting conversation.
You have now reached the end of our 'Ace The Case' management consulting case interview guide. Inside you have found detailed information on the consulting case interview and many examples of how to answer different types of case questions common amongst consulting firms around the world. Hundreds of thousands of individuals apply to management consulting firms every year hoping to land their dream job, so you are privileged to have witnessed second hand, dozens of case interview questions which have actually been asked to real life job seekers and university graduates like yourself.

By reading this guide you have gained an advantage in the competitive interview process as you now have a better idea of what to expect when you walk in the door. Our proposed solutions were provided to demonstrate how to go about intelligently answering case interview questions. We also provided several hints, tips and tricks for simplifying complex problems and bringing structure to your answers. This should all help put you ahead of your fellow candidates when you are about to experience your initial case interview.

At the end of each section you would have seen additional case questions for you to try yourself in your own time. This is essential if you truly want an edge against the competition, as they will allow you to practice answering management consulting case based interview questions, ensuring you improve. Try using a friend to help you and be conscious of sticking to a set length of time.

We hope you have enjoyed reading this guide and have gained an insight as well as some experience when it comes to answering case questions in management consulting interviews. We wish you the best of luck in applying for consulting jobs and in every round of your consulting interviews. Remember to always be yourself, structure your answers, be aware of time and most of all have fun with the case questions because this ensures that your all-important personality shines through, in addition to your natural abilities in business, mathematics, logic, analytics and creativity.

Good luck in scoring your dream consulting job and launching yourself into the rewarding world of management consulting.