Guesstimate

Caselet 1*: One of the leading players in the Indian airline industry wants to re-paint the exteriors of its entire fleet. How many litres of paint would be required for this?*

Candidate: I have some follow-up questions. Does the airline have international flights?

Interviewer: No. Consider it to be a leading domestic player.

Candidate: Fine. Do we have an idea about its reach - number of cities covered?

Interviewer: What do you think would be a reasonable estimate?

Candidate: Since, it's a leading player, it would have a wide reach - say around 20-25 cities.

Interviewer: That's a good estimate.

Candidate: To arrive at an estimate of its fleet size, I would find out the # of planes required to cover its network of cities with an estimated # of frequency per day. I have segmented the cities into two buckets – Metros (Tier1) and Tier 2/3 cities.
Tier 1: Delhi, Mumbai, Kolkata, Chennai, Bangalore, Hyderabad (Total: 6 in number)
Tier 2/3: Ahmedabad, Pune, Jaipur, Lucknow, Bhubaneswar etc (Total: 15 in number)

Interviewer: Fine.

Candidate: I assume there would be direct flights (to and fro - twice per day) between all Tier 1 cities, direct flights (to and fro - once per day) from Tier 1 cities to some Tier 2/3 cities (say half of them) and some direct and some hopping flights between some Tier 2/3 cities. Is it valid assumption?

Interviewer: Sounds like a valid assumption.

Candidate: (Reading out loud while calculating on paper) 40

Among Tier 1 cities: 6C2 = 15 combinations. Avg travelling time = 2 hrs. To and fro plus waiting time = 2+2+2 = 6 hrs. Twice per day = 12 hrs.
I guess a plane can't be used for more than 12 hours per day. Hence, 15 planes would be required.

Between Tier 1 city and Tier 2/3 cities: 6C1 * 15C1 = 90; Not all combinations for direct flights would exist. Let's take 1/2 of this. That makes it 45.

Avg travelling time (to and fro) + waiting = 6 hrs. Flying time per day per plane - say 12 hrs. (6*2). So, planes required = 45/2 = 23
Among Tier 2/3 cities: Say direct flights for 5 cities and they cover remaining cities as hopping destination. 5C2 = 10 (similar calculation as above)
Hence fleet size = 15 + 23 + 10 = 48. Is this a good approximation?

Interviewer: Yes, very good. So, how many litres of paint would be required?

Candidate: The fleet would comprise of different types/sizes of planes. The ones connecting the metros would be bigger than the ones for Tier 2/3 cities. Do we have information on size of the planes?

Interviewer: Well, what do you think would be fair estimate?

Candidate: For the purpose of estimating paint required for exteriors, I can assume the plane to be in the shape of a cuboid.
Length: Bigger planes have generally 30 rows of seats. Each row say occupies 3 feet.
30*3=90 feet plus cockpit plus restrooms space = ~120 ft
Breadth: 3*2 seats in each row. ~6 * 1.5 feet each + separation distance = ~12 ft
Height: Interior height = one persons height (6 ft) + allowance of say 2ft = 8 ft. External height might be double of this = ~15 ft

Caselet 2: *A company has designed a new golf ball which can potentially last forever (can withstand any amount of wear & tear). How should it be priced?*

Candidate: What does the company manufacture? Do they already have a golf ball offering?

Interviewer: They manufacture sports equipment and yes, they do have a golf ball offering.

Candidate: Ok. What are the types of golf balls available in the market?

Interviewer: There is very little variety, but there are two major firms (apart from this company) that manufacture golf balls. A golf ball would be priced in the range of $10-15.

Candidate: My approach would be to first understand the value add this product brings. For that, I would estimate the typical number of golf balls used by an average user in his lifetime (discarded due to wear & tear) and the average loss rate of balls during play. Our product addresses the former issue only. Then I would compare it to the value a normal $10-15 ball gives (in terms of average life), and arrive at a price point for the new ball (by extrapolation). Next, I would like to know the cost of manufacture - to get an idea of the operating margin.

Interviewer: Yes, but what would you do with the margin?

Candidate: So the margin (difference in price computed and cost incurred) can be reduced - given that consumer acceptance would be low for a new product. We can divide the surplus between the producer and consumer. In order to fix the price, I suggest we could conduct consumer surveys to get an estimate of the willingness to pay within the arrived range.

Interviewer: But who do you include in this survey?

Candidate: Regular members at golf clubs could be a good starting point.

Interviewer: Sounds good. So go ahead now with your pricing analysis.
Candidate arrived at guesstimate for average number of balls used in a lifetime. E.g. playing from 20-60 age (US context), plays 3 days a week, average plays per ball, factor in number of balls lost in a year etc. and finally comes with a price estimate.

Caselet 3 : Estimate the demand for natural gas in India.

Case Discussion

Candidate: To estimate the demand, we can look at aggregate per capita energy consumption of the population and look at the share of natural gas in that.

Interviewer: This approach won't work. Think about some other approach.

Candidate: We can focus on the various drivers of natural gas consumption.

Interviewer: What are they?

Candidate: The primary drivers are transport, domestic consumption and power generation.

Interviewer: This approach is fine, but you are missing 2 important industries.

Candidate: Another important factor is industrial consumption.

Interviewer: Right and the other important driver for natural gas demand is the feedstock in chemical manufacturing facilities which basically use methane and natural gas as a starting point for some reactions. Ok, let's take transport and estimate the demand from transport.

Candidate: There are 2 types of transport: personal and public transportation. In personal, I will estimate the distance travelled by a person times the share of natural gas powered vehicles. For public, again I will estimate the total distance covered by public vehicles. I will estimate the share of natural gas powered vehicles and use the number of such vehicles for the calculation of total distance.

Interviewer: The approach is fine but to get a better clarity, the public transportation can again be split based on vehicle type like buses, rails and autos. Now, let us proceed to power generation, which is a major consumer of natural gas in the country. Estimate the demand there.

Candidate: What is the total production of power in India?

Interviewer: 150GW

Candidate: Can I get the share of thermal power production and then the share of natural gas based power production within that?

Interviewer: The share of natural gas based power plants is 15GW.

Candidate: What is the amount of natural gas needed to produce 1GW of power?

Interviewer: You need about 1 billion cu meters of natural gas/GW.

Candidate: Total demand will be 15 bn cu.mts.

Interviewer: This scenario was in 2008. Now estimate the demand in 2010.

Candidate: Any growth in demand can come from increase in consumption from existing power plants or if any of the existing thermal plants are substituted by natural gas plants.

Interviewer: New natural gas plants take time to setup. But can you enlist factors that would drive the growth in the number of natural gas plants.

Candidate:

1. Better availability of natural gas
2. Lower fuel (natural gas) cost
3. Decrease in transportation costs of natural gas
4. Environmental aspects and laws promoting natural gas
5. Better availability of plant technology

Interviewer: Let us concentrate on the first factor. I have another data for you - The current PLF (Plant Load Factor) of natural gas plants is 60%.

Candidate: What should be the ideal PLF?

Interviewer: It should be around 90%.

Candidate: Can I know the reasons for low PLF?

Interviewer: It was because of minimal availability of fuel.

Candidate: So, we have supply side constraints. Do we have any data on a possible increase in domestic production of natural gas?

Interviewer: It could be possible, as Reliance have found natural gas in KG basin.
Candidate: Are there any import restrictions on natural gas?
Interviewer: There are no restrictions on import, but the infrastructure for this is not adequate.
Candidate: Is work on building this infrastructure in progress?
Interviewer: There are a few natural gas terminals under construction.
Candidate: I guess these will remove the supply side constraints.
Interviewer: What would be the consumption if the supply side constraints were removed?
Candidate: Then the PLF will increase from 60% to 90% (1.5 times). Hence the total demand will be 1.5 X 15 bn cu mts.
Interviewer: Good. It was an excellent analytical analysis of the case. You also got most of the factors influencing the demand for natural gas right.

Caselet 4 : It is the year 2005. Your client is in planning to start BPO call centers in India and he needs to know whether the talent supply in India is sufficient in the period 2005-2010.You have been hired to figure out the pool of people available for hiring for such call centers.
Case Discussion
Candidate: Since in this case the supply side is important, I would like to structure my discussion around the pool of people interested in joining BPOs. Hence I would like to take the population approach and estimate the number of youngsters in the particular age group of 18-30 in the specific income groups.
Interviewer: That is a decent approach to take but could you think of any other approach that will give you a more accurate picture.
Candidate: Ok, another alternative approach that I can think of is to go by the number of colleges in India and then estimate the percentage of students who would be interested in joining call centers. Would that be a good approach to proceed with?
Interviewer: Yes, that approach would be better. In fact I would like you to look at three specific cities where the client is looking to operate - Bangalore, Mumbai and Delhi.
Candidate: Ok. So since I am more familiar with Mumbai, having lived there for a considerable number of years, I would like to analyze the situation for Mumbai and then extrapolate it to the other cities, as the metropolitans can be considered quite similar.
Interviewer: That's a fair point. So, you can proceed with the analysis of Mumbai.
Candidate: From what I know, Mumbai has about 45000 engineering seats and if we take an approximation of 300 students per college, we can estimate about 150 engineering colleges in Mumbai. Considering that non-engineering colleges will have a larger proportion of people interested in such call centers, I will consider the total number of colleges who students would be interested in such a job to be, around 600 (150 engineering, 150 B.com, 150 BA and 150 others).
Interviewer: Ok. In our case, let us assume that the number of students per college is around 600.
Candidate: Ok, so for estimating the number of students graduating each year, let us consider 600/3.5 students since on an average the duration of the courses would be 3.5 years (3 for BA, B.Com and 4 for engineering). That makes it 600*600/3.5 that is approximately 1 lakh students graduating every year.
Now, I can think of two factors to determine the students who would finally constitute the talent pool - the level of interest in the students and the ability of students to speak proper English.
Interview: Ok, fair enough. So you can assume that the level of interest is 73% and the ability of students is 37%.

Candidate: So that makes it 73% times 37% times 1 lakh, which is approximately 27000 students who will finally get into this profession from Mumbai. And extrapolating it to the other 2 cities,assuming an approximately equal population and number of colleges in the three cities, I would get a number of approximately 81000 per year.
Interview: Yes that is a fair estimate. Now could you tell me 5 reasons which will cause your estimate to change, some factors that you may have missed to make calculations easier or something that my client could try to increase the current estimate?
Candidate: Yes, definitely. I have made some assumptions such as ignoring migration which is a large factor especially for Mumbai and Delhi. Also I have not assumed the college going students who will treat this as a part time job, especially considering the trend of increased expenditure by youth these days. Another thing I can think of is expanding to other smaller cities apart from Delhi, Mumbai and Bangalore, because it might be cheaper to set up, though the availability of talent would be lesser than a metropolitan.
Interviewer: Good. So you have given me 3 reasons. Can you think of more ways by which we can increase the job pool?
Candidate: Yes, in fact I can think of 2 more ways: one is increasing their level of interest from 73% by pitching and advertising to more colleges attracting more youngsters and the second is increasing the percentage of people who are capable of doing the job, that is people well-conversant in English, by investing more in training initiatives.
Interviewer: Very Good, I think more or less we have covered everything that was required. There is just another interesting aspect. A problem that many such BPOs face is lack of good people at managerial level. We could have looked into that also, apart from the actual callers. But that apart, the analysis has been good. Thank you.

[*Comments: While doing the calculations, keep small sanity checks in mind like while doing 73X37, make it approximately 2700. Try and approximate as much as possible as that allows you less chances to make blunder. The case essentially wanted to test the guesstimate skills of the candidate and particularly see if the candidate can figure out the main factor that determines the employability of a person in a call centre (i.e. conversant in English)]*

Case Interview

***Caselet 1**: A large construction company is to build a high-rise office complex in Mumbai, but faces heavy costs in sourcing material. Suggest how or why?*
Candidate: Rising commodity prices due to construction boom in India is a possible reason. Can the company explore alternative options such as plastic concrete or building bricks made from recycled plastic?
Interviewer: Fine, green materials is one suggestion, but not practical.
Candidate: How much material does the company source within India? How much from outside?
Interviewer: There is very little sourcing from outside India.
Candidate: Do they have any long-term contracts with suppliers? Can they negotiate terms?
Interviewer: Yes, they have long-term contracts for a few materials. Can you guess what could be the terms of such a sourcing contract?
Candidate: The Company would have arrived to the supplier through an RFQ or Reverse Auction process, correct? They would have received quotes from many suppliers?
Interviewer: Yes, that is a fair assumption
Candidate: So, the contract negotiated would have details of the price and an inflationary adjustment factor?
Interviewer: Yes, go on. What could be the other conditions in the contract? The interview went along these lines till many concepts in strategic sourcing and supply chain management were covered.
***Caselet 2**: A large Indian car manufacturer has huge revenues but poor profits. How would you approach their problem?*
Candidate: Clearly, their costs are too high. If I name various cost heads, would you suggest which ones I should explore further?

Interviewer: Go ahead and name a few cost heads.

Candidate: Material costs (unsatisfactory relationship with suppliers, escalating commodity costs), R&D costs, production costs, recent investments and related costs of capital, import costs - which one should I explore?
Interviewer: Explore each one of those and explain the technicalities.
(After that was completed) Could there be any reason other than the costs?
Candidate: Are there any heavy duties (taxes) that the Company is paying?
Interviewer: Can you illustrate what kind of heavy taxes could be levied?
(After that was completed, I was asked to elaborate on any other reasons for low profits)
Candidate: Could it be that the Company was not charging an adequate premium on the product?
Interviewer: So, why would any Company do that? Could you list a few reasons?
Candidate: Competitive market, poor industry profitability, Company has commitment to customers to sell at lower prices (like Nano), heavy exchange offers or discount schemes affecting profitability, month-end schemes to reach sales targets hitting profitability.
(Reasons affecting profitability) The Company may not be making good use of its customer service channel. This is usually a profit centre. The company should check its spare parts sales and annual maintenance contracts (AMCs)
Interviewer: How would an AMC affect profitability?
Candidate: An AMC for a defective product would mean free replacement and hence, the Company loses money on them. It could also be that the AMC business is not doing well and the Company is spending on the business. This could pull down profits.

Interviewer: What about spare parts business? How could that be critical? How does a Company manage that vertical?
Candidate: The mark-up on the cost at which it is procured may not justify expenses. There are costs of maintaining warehouse, paying the service provider, transportation (FOC) costs, packaging costs, cost of schemes in the market, promotional material in the retail markets.

Caselet 2: *A Fortune 500 packaged foods company is facing a consistent rise in MRO costs for its plant in England. How can sourcing strategy be changed to mitigate this?*

Candidate: What are the different categories of MRO components? How is total MRO expenditure distributed across these categories?

Caselet 3 : Our client is a biscuit manufacturer. They have hired a consultant because the firm felt that it was not cost effective. Help the client figure out where they can cut costs.

Candidate: The various cost elements in the firm will be manufacturing, supply chain and distribution costs and other administrative costs. Manufacturing can be again divided into procurement cost, raw materials cost, labour wages.
Interviewer: Ok, start with the supply chain.
Candidate: I need some background information regarding the company such as how many manufacturing plants it has?
Interviewer: The Company has 15 3rd party manufacturing plants and 3 plants of its own. The supply chain is common for all.
Candidate: I will split the supply chain again into inward and outward logistics. There will be various raw materials such as corn, flour, oil, sugar and butter for the manufacturing of biscuits. Can I get the cost of each of these components?
Interviewer: Focus on outbound supply chain.
Candidate: What is the structure of the distribution channel?
Interviewer: Basically, there is inventory from factory to warehouse and then to distributors.
Candidate: I will look at transportation costs and inventory costs in these cases. Can I have the split up of costs for transportation like the transportation cost/unit?
Interviewer: Transportation cost/unit is Rs10 and the distance between factories to the warehouse to 500kms.
Candidate: Does the transportation company charge the same amount for all similar transports across the industry?
Interviewer: The unit cost of transportation for all the competitors is the same.
Candidate: What is the distance from the factory to warehouse for the competitors?
Interviewer: We do not have that information, but in general the average distance travelled by trucks for transportation in the industry is 300kms.
Candidate: In that case our company's trucks are traveling a greater distance compared to our competitors. Can I get the location of the factories and warehouses?
Interviewer: The factories are located in remote locations. This was actually the reason for high costs for the client. The client was spending heavily on transportation. I think that concludes our discussion in the case.

Caselet 4: The CEO of a retail company has approached you with the problem that his company is burning cash. He wants you to provide suggestions to improve his business.

Candidate: Sir, I would like to understand the question better. By burning cash you mean to say that the store is incurring losses.
Interviewer: Yes.
Candidate: Sir, before I analyse the reasons for this loss, I would like to understand the business better. What kind of retailing are they into?
Interviewer: They are in apparel retailing.
Candidate: I would like to know the region of operation of these stores and the number of stores that they have.
Interviewer: So they have 12 stores across India. Out of these 2 are profitable and 10 others are in loss.
Candidate: As I understand the market conditions in different parts of India would be different and hence it would take different analyses for them. I would have to group the stores region wise and understand what causes them to be in profit or loss.
Interviewer: Sounds good. Let us concentrate on the Bombay city region.
Candidate: Sir, within the Bombay region I would like to know the number of stores and the kind of segment they are targeting. Also I would like to know the kind of competition we have.
Interviewer: So, they have 1 store in Bombay which is situated in a suburban mall. We are a value for money store. There are 2 similar stores in the mall which target the same segment.
Candidate: Sir, the decline of profit may depend on external or internal factors. If the profit of all the stores in the region is dropping then it may be due to a drop in demand or some regulatory issues. Internal issues will consider the operation side of the business.
Interviewer: There have been no external factors as you say. In fact the business of the competitors has been growing steadily.
Candidate: In order to understand the loss I would like to consider the revenue and costs aspects of the business. So, have the revenues of our business dropping?
Interviewer: Yes they have. Can you explore the reasons?
Candidate: I would like to understand the revenue streams of the business first. The principal revenue earner would be the sale of clothes.
Interviewer: So can you think what would the revenue from clothes sale depend on?
Candidate: The sale would depend on the following factors:
1. No. of customers entering the store.
2. The no. of customers entering actually buying the clothes.
3. The Pricing of the clothes.

Interviewer: That is correct. The number of customers entering is known as Footfall, and the no. of persons buying is known as conversion ratio. What would you like to do next?
Candidate: Before I analyse the sales revenue, I would like to know if there are any other revenue streams. Do they have a food joint/ancillary business?
Interviewer: They have a CCD running on the premises. Can you think of any other revenue stream?
Candidate: ……(thinks)….Not really sir.
Interviewer: There is also another revenue stream from the advertisements that the brands put up within the store.

Candidate: I think the revenue from advertisements should be more or less fixed. How is the revenue from the CCD obtained?
Interviewer: The CCD pays a fixed lease amount to the store. There is also a variable component which is determined by the sales.
Candidate: So, the CCD revenue would depend on the no. of customers entering the store. The conversion ratio for the clothes would depend on the service level and the quality of the clothes that I have. Are the two dropping?
Interviewer: Yes
Candidate: About the price, has the price of our clothes remained constant?
Interviewer: Well the average price of our clothes has remained constant.
Candidate: So, I can rule out price deviations.
Interviewer: Before you rule out price can you think of some ways about how average price has remained constant but would still give you some ideas about the segmentation and the nature of demand?
Candidate: The clothes will be segmented into the high price and low price segments.
Interviewer: Yes, so what has been observed is that the sale of the high price clothes has dropped but the sale of the low price clothes has remained more or less same.
Candidate: So, the number of customers in my store has dropped. The conversion ratio has also dropped and the customers are not buying the high price clothes from my store.
Interviewer: That is correct.
Candidate: I think that this has to do with the service quality of my store and the quality of the clothes that I am having. If they are poor that would explain the low conversion rate and also the incidence of low high price sales in my store. The perception of the customers would be low and hence the low footfall.
Interviewer: Well the CEO does not agree. He has personally been to the competitors store and says that our service levels are better and the quality is comparable to them. It has to be something else.
Candidate: If that is the case, it means that customers are not coming to my store and who are coming are of a lower income segment. What exactly is my location in the mall?
Interviewer: Good question. Actually my store is situated in a very obscure location in the mall right next to the bathroom.
Candidate: That explains a lot. People would not want to come there often.
Interviewer: So what do you propose to do?
Candidate: Sir, I could install things which attract people like a kids corner or an ice cream store. I would also like to hide my store's connectivity with the bathroom as much as possible through banners etc. I could also make the high price clothes more prominent inside the store.
Interviewer: Sounds good.
Candidate: Sir, I think I should move on to the costs side now.
Interviewer: Go ahead.
Candidate: The costs can be divided into fixed and variable costs. The fixed costs components would include the rent of the store if it is not owned, maintenance, lighting etc. The variable costs would include the procurement cost of clothes and the salaries of the employees.
Interviewer: Sounds good. The store is rented. The cost of leasing is fixed. Can you think of something to reduce that?
Candidate: Sir, we can go for the arrangement like the CCD with a variable component of the sales.
Interviewer: Ok.

Candidate: Sir, I can make the salaries of the employees also variable and link them to the sales generated. That would spur sales. Also are the cloth procurement costs stable and comparable to competition?
Interviewer: Yes they are similar. Can you think of something else that could affect this cost?
Candidate: Sir, there might be damages related to the clothes. The clothes that are on display get damaged generally. Is there a cost related to them?
Interviewer: Yes we do have to sell such clothes at a 20% discount.
Candidate: We can ensure that such clothes are sold off quickly.
Interviewer: Well that's fine. I think we have had a nice conversation. Also there was problem of pilferage related to the store. The employees were stealing the clothes. However, I think we have covered the major points of the case.