Columbia Business School

CASE BOOK
2007

MANAGEMENT CONSULTING ASSOCIATION

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Case 1: University Bank

BACKGROUND

Firm: Boston Consulting Group
Round: 2007 Summer, First
Content: Qualitative and quantitative

CASE QUESTION

In Mexico banks prefer not to lend money to hospitals and schools because if one of these institutions defaults the Bank worries that it will be seen as the one responsible for liquidating their assets. We have a client who currently owns several universities. He is evaluating whether an opportunity exists to start a bank that would lend money to his various universities. There are three questions that he wants us to solve:
- Is there an opportunity to lend money to universities?
- If an opportunity exists, how big is it?
- How should he structure the bank?

INTERVIEWER BRIEFING

Recommended approach: The purpose of this case is to test the interviewee's ability to determine whether it makes sense for the client to open a bank that serves universities. In particular, the interviewee should recognize that he/she needs to gather the necessary information to determine the market opportunity for such a bank. The interviewee should ask questions to gather the necessary information to determine the market size.

Key facts:
- Population in Mexico is:
    - o 0-15 years old: 7 million
    - o 15-30 years old: 6 million
    - o 30-45 years old: 5 million
- Total number of universities in Mexico: 200
- Population growth: close to zero (use zero for the sake of simplicity)

EXAMPLE DIALOGUE

Interviewer: So, given the facts of the case, how would you consider going about analyzing this question for the client?

Interviewee: I'd like to understand a few things to evaluate this decision. First, I'd like to understand the size of the market to see whether there is an opportunity or not. Next I

would like to analyze who are the competitors, if any. In particular, I am interested in the competitors because they may decide to offer similar loans to institutions, like universities. Finally, I would like to know what the university can leverage from its own operations to develop this idea, etc.

Interviewer: That seems like a good starting point. Let's start by analyzing the market. How would you do that?

Interviewee: Ok, I will start by analyzing how many people go to university per year. If the population grows at about 1% per year, this means that next year there could be more people attending universities than space available. I would use a guesstimate of the percent of population enrolled in universities to calculate the number of students currently enrolled across Mexico. For simplicity sake I will assume that all potential students attend universities in Mexico, excluding the percent that attends school abroad.

Age range	Population	% Enrolled in University (guesstimate)	Enrolled In University
0-15 years old	7 million	0%	0.0 million
15-30 years old	6 million	25%	1.5 million
30-45 years old	5 million	2%	0.1 million
			1.6 million

There are roughly 6 million Mexicans between the ages of 15 and 30, and I would assume that they are evenly distributed. That is, there are 400,000 people in each year of age (e.g. 400,000 people who are 15 years old, 400,000 people who are 16 years old, and so on until the age of 30). If I assume that 25% of the people between the ages of 15 and 30 go to university, that means we have 1.5 million students between the ages of 15 and 30.

Interviewer: Those assumptions seem to be very good ones. What else would you need to consider?

Interviewee: Ok, I think that I will need to figure out how many schools there are in Mexico and how many students are enrolled in each school.

Interviewer: Sure, our client has told us that there are 200 universities in Mexico and we can assume there they are all at full capacity.

Interviewee: Ok, so 1.6M divided by 200 means that there are 8,000 students at each school. I might think that this seems like a high number. In the United States we have part-time students and full-time students. If this is similar in Mexico, the universities would likely be able to accommodate more students without any investment.

Interviewer: *No, they can't do that as the law prohibits it.*

Interviewee: Okay, so if the population grows at 1% per year and there are no new people going to university for other reasons (e.g. better economy) this means that in any given year we will have 1.6M multiplied by 1% new students. We would have 16,000 incremental students. Given that we know the schools are at full capacity, we would need two new schools.

Interviewer: *Okay, so now let's focus on how would you segment the schools in order to think about the credit scoring they may have?*

Interviewee: I would segment them based on:
- New school or just new branch to an existing school. I believe that it is less risky to lend to a company that already has a business in place.
- Flow of people to school: it's much more secure to lend to a school that has plenty of students in each year than to one that has the same number but distributed in a different way (e.g. most of the people finishing their careers and almost nobody in the first or second year).
- Geography: We are speaking in averages. There may be areas with no population growth. There may be an uneven dispersion.

Interviewer: *How would you calculate how much money a typical school would need?*

Interviewee: There are two different streams of costs we have to consider. On the one side the cost of building a new school – including buying the land, the construction, etc. – and the funds needed until the company reaches a state in which it has a positive free cash flow.

Interviewer: *Great. Tell me the number, or at least how to get it.*

Interviewee: The better is to rely on our client experience. He has 15 schools so there are some experiences we can leverage there?

Interviewer: *Let's move on. How would you fund this project?*

Interviewee: I will think about a couple different ideas such as:
- Unilateral organizations (e.g. World Bank, etc.)
- The Government as it may need to help some private schools that focus on careers that are not available through public university.
- Banks: They may not be willing to do this on their own but may want to partner with someone that knows about this industry.

Interviewer: *Ok, fair enough. Our client is asking you to summarize the situation. What would be your recommendation?*

Interviewee: Can I take a moment to recap all the findings?

Interviewer: Sure.

Interviewee: I will tell the client that it seems to be a pretty interesting opportunity to provide capital to build new schools which would be at least two per year given the growth in the population.

Case 2: Mine in Chile

BACKGROUND

Firm: Boston Consulting Group
Round: 2007 Summer, First
**Content:** Operations

CASE QUESTION

Our client is a company which is going to exploit a mine that is expected to be full of a very unique ore, and has asked us in which order his company should extract the ore from the field. The ore will then be sent to a factory that his company already owns.

INTERVIEWER BRIEFING

Recommended approach: The interviewer is testing whether the candidate can identify a useful algorithm to determine the best way to extract ore from this field. The candidate should not initially waste any time developing one idea too fully; instead he/she should come up with a few reasonable suggestions and test them for validity with the interviewer. The candidate should, like in most cases, be aware that he/she is missing critical information and should identify what he/she needs to solve the case and then ask the interviewer for this data.

Key facts:
- The field is divided in cells of equal size. Once you blow one cell there is no way the truck can pass through it to go to the factory.
- This is a plan of the plant:

Factory
Trucks enter here with rocks containing 1% of ore.
The output is 100% ore
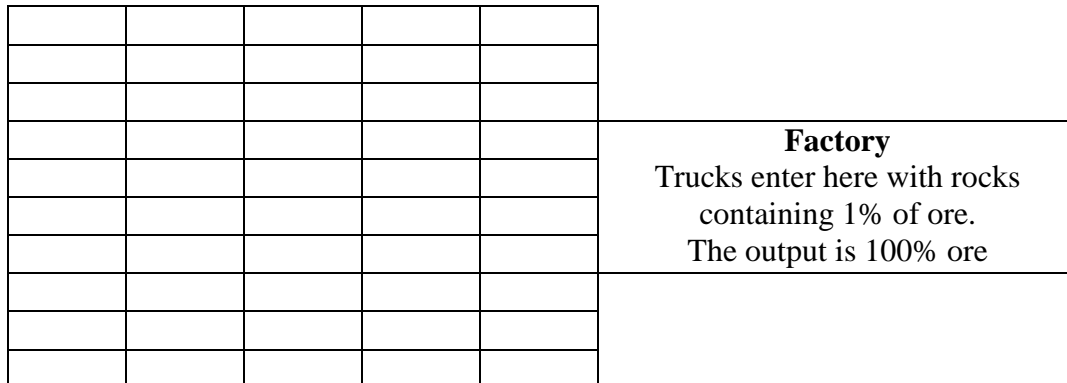
- Each cell has different ore content and therefore each cell has a different cost of extraction.
- No growth in population (for sake of simplicity).

EXAMPLE DIALOGUE

Interviewer: So, tell me how we might approach this problem for our client?

Interviewee: First, I would like make sure that I fully understand our client's needs. Let me repeat the key issues… Our client wants us to provide him with a recommendation on what approach his team should take to extract the ore in order to maximize profits.

Interviewer: Yes, that pretty much sums it up. So, what's next?

Interviewee: I can imagine a number of different ways of prioritizing which cells to take out first, such as:

- Profit: Price – Cost.
- Demand: Outlook of the price of the different types of ore. If the price is low (perhaps because demand today is lower), but we believe that this same ore will be sold for much more in the future (perhaps due to an increase in demand), it could make sense to begin extracting lower concentration cells.
  I am imagining that this could be similar to the oil industry. Think for example about the price of oil. The oil is in the field anyway so it's better to exploit the places which the least of it when the price in the market is at a low level. Unless, of course, we can store the ore for long periods of time without a large opportunity cost by tying up capital and space.
- Capacity of the plant: Maybe there is a minimum level we need to provide to the plant as input. Maybe there is a maximum… this could determine how much we want to extract in any given time period, especially, if there are penalties for operating outside of this min-max range.
- Operational issues: For example, if I dig a hole in the ground and the truck cannot pass through that cell, it may be wise to start at the cells that are further from the factory so that I do not block off routes.

Interviewer: Ok, let's assume that the points that you have raised are all reasonable. This is a complex business and I was pleased to hear you touch on many of the important points. But, first, let's focus on profits. How would you define profit?

Interviewee: Ok, in this case profits would be (price of a ton of ore) * (expected content of ore in cell) – (the cost of extraction for that cell). I will then rank each of the cells based on its overall profit contribution and determine my extraction path from there. Of course, we need to consider that if we extract from one highly profitable cell, but it cuts

off access to a lesser, but still profitable, cell, this is a cost of doing business under this assumption and should reduce my overall expected profits.

Interviewer: Let's assume that we map the field and this is what we get:

Cell 1 x = 1.0 C = 3					
	Cell 2 x = 1.3 C = 10				**Factory**
			Cell 3 x = 1.1 C = 5		

x = tons of ore in that cell
C = cost of extracting in that cell

Interviewee: Do we have any information on today's price of ore?

Interviewer: Yes, our client expects to get $10 dollars per ton of ore.

Interviewee: So, for Cell 1 the profit will be: 1*10 – 3 = 7. For Cell 2 would be: 1.3*10 – 10 = 3. For Cell 3 would be: 1.1*10 – 5 = 6. So I will start for Cell 1, then Cell 3 and finally exploit Cell 2.

Interviewer: Ok. What if price changes? Does it change your decision?

Interviewee: Yes.

Interviewer: Why?

Interviewee: Let's say price is now $30 per ton. For Cell 1 the profit will be: 1*30 – 3 = 27. For Cell 2: 1.3*39 – 10 = 29. For Cell 3: 1.1*30 – 5 = 28.   So I would recommend extracting Cell 2, then Cell 3 and finally Cell 1. This is based on the fact that the costs appear to be fixed and do not change despite the overall price fluctuations that we are discussing.

Interviewer: *Let's move on. Our client has told us that per ton P&L statement is as follows...wait, perhaps you could tell me how you would construct it?*

Interviewee: I would try to find out the average price, the average cost of goods sold and then assign some part of the SG&A costs.

Interviewer: *Ok. Here are the figures that our client provided. What is the company's break-even point?*

Item	$ per ton
Revenues	1.0
COGS	0.8
SG&A	0.6
Profit	*-0.4*

Interviewee: Ok. The company has $0.2 gross margin per ton of ore, before we factor in SG&A costs. So, if I divide SG&A by the gross margin I will find how much they have to produce. In this case, $0.6 / $0.2 = 3, which means they have to produce 3 times more to cover fixed costs.

Interviewer: *How the same P&L would look like?*

Interviewee: Basically, we have to divide the SG&A by 3. We are in essence spreading the fixed SG&A costs across more units. However, we would need to make sure that SG&A does not increase with volume of ore extracted.

Item	$ per ton
Revenues	1.0
COGS	0.8
SG&A	0.2
Profit	*0.0*

Interviewer: *Okay, can you summarize what we have identified?*

Interviewee: Sure. Our client was looking for a framework to identify the order in which he should extract cells of ore from a field. We chose to focus on profitability as the main driver. As mentioned, but not discussed in depth, profitability includes the core components of price per ton of ore, cost to extract the cell (which appears to be fixed), but also the cost of not being able to access a cell for extraction. Once we have

calculated the profits per cell our client can draw out a map to understand which cells to extract and when in order to maximize his P&L. Next we discussed the company's P&L and identified that SF&A costs are relatively significant and appear to be fixed. This means that we would want to extract more ore in order to spread these costs across production and increase overall profitability.

Case 3: UPS in Italy

BACKGROUND

Firm: McKinsey & Company
Round: 2007 Summer, First
Content: Quantitative

CASE QUESTION

The CEO of a startup in a small village in Italy has hired McKinsey to help them decide how many trucks to lease. There are different models available, but our client has been told that he/she will need to have a consistent fleet (they can only lease one model type) and so we will also need to identify what model he/she should lease. This company provides the local delivery of packages sent to this village through UPS next-day-delivery service.

Let me provide a quick overview of how the company operates: (i) They receive every package at 5pm from UPS, (ii) a bunch of people then sort the packages and (iii) load them on a truck where they are stored overnight, and (iv) then deliver them starting at 9am for 10 hours. How would you suggest approaching the client's problem?

INTERVIEWER BRIEFING

Recommended approach: This case tests a candidate's ability to analyze how many packages must be delivered and to see if the bottleneck is the time or the truck size. Not all information is provided up front to the candidate; he/she should be aware of this and must identify additional data that will allow him/her to solve the case.

Key facts:
- Packages delivered per day: 1,000.
- Dimension of package (envelope) is 1x1x1.
- Operates five days a week.
- It takes 8 minutes, on average, to deliver a single package and to be ready for the next one ("assume they deliver one every 8 minutes").
- Truck A costs $150 per day and its dimensions are 3*4*5.
- Truck B costs $40 per day and its dimensions are 9*2*1.
- Truck C costs $130 per day and its dimensions are double the size of truck A.
- Drivers, fuel, etc. are not considered and do not make a material difference to the analysis (for sake of simplicity).
- The case will include additional questions not addressed in the initial scope.

EXAMPLE DIALOGUE

Interviewer: So, how would you go about analyzing this problem?

Interviewee: I'd like to understand a few things to evaluate this decision. First, I would like to start by analyzing the demand. I would like to know how many packages we have to deliver and how long, on average, it would take us to deliver a single package. Then, I would like to analyze the numbers in the context of the three truck models our client can lease.

Interviewer: Ok. We can satisfy a demand of 1,000 packages / day and it takes 8 minutes on average to deliver each one.

Interviewee: So, 8 minutes per package / 60 minutes per hour * 1,000 packages / 10 hours = 13.3 trucks. So we need at least 14 trucks. I would like to think about the leases we can consider.

Interviewer: Ok. Let me show you the information we received from the client:

Truck	Cost per day	Dimensions
A	$150	3*4*5
B	$40	9*2*1
C	$130	6*8*10

*Truck A cost $150 per day and its dimensions (for the packages) are 3*4*5. Oh, by the way, you did not ask about the average size of an envelope, but our client has told us that the average size is 1*1*1.*

Interviewee: Ok, so when assessing Truck A we multiply 1,000 (total packages for all trucks) by 1*1*1 (average package size) and divide by 3*4*5. We will know how many trucks we would need of the Truck A model. My calculations show 16.6 which would mean we would need 17 of this type of truck. As 17 is more than the time constraint of 14 truck to ensure on-time delivery, we stick with 17.

So, this is the result of performing this analysis for each type of truck:

Truck	Cost per day	Dimensions	# trucks (rounded)	# trucks (minimum)	Total cost per day
A	$150	3*4*5	17	17	$2,550
B	$40	9*2*1	56	56	$2,240
C	$130	6*8*10	3	14	$1,820

Now, from a pure financial analysis, I would recommend leasing 14 trucks of the C Model because it will allow our client to minimize the cost while ensuring on-time delivery (customer satisfaction). On the other hand, we also might consider that there would be plenty of room for delivering other things if they can figure out how in the future.

Interviewer: Ok, it seems a good idea. Let's move on. Now imagine 6 months have passed and your recommendation was pretty successful. Now the CEO want us to investigate any potential risks that he/she should be assessing/considering.

Interviewee: Can I take a minute to organize my thoughts?

Interviewer: Ok.

Interviewee: So, I would like to go over this problem by analyzing both internal and external factors. Here there is a list of the things I would think about:

Internal	**External**
▪ Need for extra drivers (e.g.: people get sick) – do we have enough employees ▪ Unionized drivers may shift labor cost up in the future ▪ Need to lease more trucks because trucks can break down causing late delivery ▪ Insurance costs ▪ Extra fine tickets than forecasted because drivers want to deliver on time ▪ Etc.	▪ Only one supplier (UPS) – we are captive to UPS ▪ Adoption of new technology (e-mail) might reduce the need for sending packages ▪ Government regulation ▪ New competition in the city – there are no real barriers to entry, since UPS would likely partner with any carrier who can deliver on customer service metrics at a cheaper cost ▪ No association with our brand, thus our supplier can switch to our competitors or start its own operation ▪ Etc.

Obviously, I could analyze the sorting operation more to make a more profound (exhaustive) analysis but that was not covered on our initial discussion.

Interviewer: Don't go that direction. Let's think of another scenario. Now we have to investigate sources for profit growth for this company with one restriction, we can neither add new truck leases nor change the existing ones.

Interviewee: Ok. Let me think, about increasing revenues:
- Extend hours: the trucks are already paid for the day, if we extend the delivery time after 7pm we can deliver more of UPS or from other companies, even local companies. That would go (impact) directly to profits.
- Different packages: we may recommend to UPS to sell different (more robust) packages to some clients and get part of it.
- Pick packages: every time we leave a package we make space to pick a package and deliver it to another part of the village or to give it back to UPS to send it to another place
- Get contract with a new operator: see whether we can deliver stuff to other company who is in the delivery business but does not compete directly with UPS. Thought we can not add new trucks we can think about utilization of current trucks
- Advertisement: are the trucks painted with UPS logos? We can sell advertisement to them or to other companies. Those trucks are all day in the street.
- Insurance: offer insurance of packages to clients.

Interviewer: What else?

Interviewee: We can also think about streamlining operations (reducing costs). I would think about them in terms of fixed and variable costs.
- Evaluate the route of each truck to reduce time or usage of gas (fuel)
- Improve technology usage in the sorting and loading packages. May reduce number of people at the factory
- Re-negotiate leasing terms for trucks
- Move warehouse to a cheaper place

Interviewer: Ok, we are out of time, but thank you for the list of business challenges that the client should assess, I am sure that some of these will lead to very interesting discussions.

Case 4: Refrigerators in India

BACKGROUND

Firm: McKinsey & Company
Round: 2007 Summer, Second
Content: Quantitative and qualitative

CASE QUESTION

A producer of high-end refrigerators in India has hired McKinsey to help him solve a profitability problem. Two years ago the company had a record year in terms of growth. Though they were correct in understanding the size of the market and how it would grow, their gross profit decreased by approximately 70% and the CEO is very worried about the situation. The client has asked us to identify what happened and what can be done to restore profitability?

INTERVIEWER BRIEFING

Recommended approach: This is a typical profitability question. A good way to go over it is to break down the profit equation into the different concepts, build hypothesis, and test them.

Key facts:
- 800 million people in India
- Two years ago units sales in India were 5 million and last year 6 million
- The client's company builds and sells high-end units

EXAMPLE DIALOGUE

Interviewee: Can I take a minute to think about this problem?

Interviewer: Yes.

Interviewee: Ok. I would start by breaking down the problem into revenues and costs in order to identify the potential drivers of the drop in profitability.

Interviewer: Great. Let's start with the costs.

Interviewee: Ok. Given that we know that this market has been growing quickly, I would like to know whether our client has decided to build a new factory to keep up with the

growth. If that was the case, depreciation and amortization and interest on debt (if it was paid buy issuing debt) could be putting pressure on the profit of the firm.

Interviewer: You are definitively right in your analysis, but I have to tell you that although they have built a new plant, there is no problem on the cost side. I can tell you that since we have just finished another engagement in which we streamlined all his operations.

Interviewee: So, now I would like to understand a little more about the revenue side of the profit equation. Perhaps I could learn a little more about the market. I'm most interested in having some assumptions to determine the size of the market.

Interviewer: Sure. What do you want? If you ask for specific information I may have it.

Interviewee: Ok, I would like to know the population of India, the number of households and what kind of refrigerators the client produces.

Interviewer: Assume 800 million people and... I am not sure about households... guess something.

Interviewee: I would say that there might be 5 people per household, which leads to 160 million households. Based on my experience I will say people change their refrigerator once every 5 to 7 years.

Interviewer: Sounds reasonable, let's say 7 years.

Interviewee: If I had the number of units sold in the market last year I would be able to understand how many people actually have refrigerators at home in India. Do we have any information around the percent of households that have a refrigerator?

Interviewer: Last year sales were 6 million units and one year before they were 5 million units.

Interviewee: So,

Item	Quantity
Population	800,000,000
# per household	5
Households	160,000,000

Income	# sold	Years between change	Market size
Two years ago	5,000,000	7	35,000,000
Last year	6,000,000	7	42,000,000

Interviewer: *You are saying that the number of refrigerators for home-use was 35 millions two years ago and 42 millions last year?*

Interviewee: Yes. However, I might question whether the 7 million growth of last year could have been in a segment not served by your client.

Interviewer: *How do you know that?*

Interviewee: Well, we concluded that there are 160 million households and from our estimation we get that only 42/160 = 26% have a refrigerator. On the other hand you mentioned that they produce high-end which may signal that the growth is coming from the low income part of the society, for which your product may not be priced at a competitive level or even the product not designed for their needs.

Interviewer: *You are completely right. What we should do?*

Interviewee: There are several options.   Our client can try to use the extra capacity they have in the new plant to focus on building lower-end refrigerators, leveraging their supplier relationships, dealers, etc. However, we would need to consider how to brand these refrigerators so as to not detract from the quality associated with the higher end of the market. They can think about exporting the extra capacity to other countries where their product offering is competitive and there is market for growth, they can start offering financing for this particular segment…

Interviewer: *Fair enough, let's imagine that the marketing director came last night and proposed to reduce price by 20% to appeal to this segment, which he thinks will increase sales by 30%.   Should we support him?*

Interviewee: Is that all the information we have?

Interviewer: *Yes.*

Interviewee: Let me think. Lets denote P = Price, C = Cost of goods sold, Q = Quantity. The general formula to make this decision should be $P*Q - C*Q > 0$. In this case:

$$80\%*P*130\%*Q - C*130\%*Q > 0$$

$$104\%*P*Q - C*130\%*Q > 0$$

Break-even point at:
$$104\%*P*Q = C*130\%*Q$$

$$104\%*P = C*130\%$$

104%/130% = C/P

80% = C/P

COGS of 80% over price does not seem to be completely out of what we would expect in a manufacturing company. I would worry about COGS being just 25%, which will signal that reducing price by 20% is not a good idea to attain 30% more sales.

Interviewer: Thanks.

Case 5: Mexican Dishes

BACKGROUND

Firm: A.T. Kearney
Round: 2007 Summer, First
Content: Quantitative

CASE QUESTION

A friend of mine has asked me to invest in his company, which makes dishes for the Mexican market. He has mentioned that he is going to use my investment to purchase a new manufacturing machine that he expects will allow him to double production. Should I invest in his venture?

INTERVIEWER BRIEFING

Recommended approach: Rather than jumping directly to analyze in depth the market, the competition and/or the company's capabilities, it is recommended that you use a dialogue to seek out more information. When mentioning the themes you would like to cover explain your reasoning behind each one.

Key facts:
- 110 million people live in Mexico. Assume 100 million for sake of simplicity.
- Population growth can be approximated to be 1% per annum.
- Income distribution: 5% of population top, 45% middle class, 50% bottom.

EXAMPLE DIALOGUE

Interviewer: So, should I invest or not?

Interviewee: Ok, I would like to analyze three key areas that I expect will help me understand whether this is a good opportunity or not. I believe it is important to first analyze the market, focusing on its size, growth potential and trends in terms of product design, then understand who are my friend's key competitors and finally understand what this company can leverage from its existing operations once the new machine is in place.

Interviewer: Good idea. Let's focus on the market for a moment. How would you go about sizing it?

Interviewee: There are a number of ways to do so. We can do some research and talk to your potential partner to get some information. Alternatively, we can visit some of the

store or chains that sell that kind of product to build a market size from the bottoms up. Finally, we can estimate that number based on the population, etc.

Interviewer: Ok, let's do the estimation based on the population. In Mexico there are 100 million people. What else do you need?

Interviewee: Do you have the income distribution pyramid of Mexico? I believe that income will play a role because households with higher incomes may purchase higher-end dishes or may purchase different quantities than households at the other end of the income distribution. I would also like to get a sense of the replacement rate, if not given I can estimate…. And, whether there are any key substitutes that I can expect in the market in the next few years, to ensure that my estimates are fair.

Interviewer: Assume income distribution is 5% of population top, 45% middle class and 50% at the bottom. And, you can assume a 15% per year replacement rate.

Interviewee: Ok. Let me quickly use these numbers to analyze the size of the market. I will calculate first "the stock", which is the size of the market given by the replacement of dishes. Then I will calculate "the flow", which is the size of the new market.

Item	Quantity
Population	100,000,000
# per household	4
Households	25,000,000

Income	# of different Sets	Total # of sets	Total # of sets (replaced)
High	3	3,750,000	562,500
Medium	2	22,500,000	3,375,000
Low	1	12,500,000	1,875,000

Interviewer: But… Are you sure that we can address the whole market?

Interviewee: No, in fact this was only to calculate the full market size. I still wanted to ask you which part of the market this company targets, is it within one income class?

Interviewer: Okay, they target the medium segment, which by your calculations is of about 3.4 million sets per year, among medium income households.

Interviewee: Great. However, I would still want to understand the projected market growth. If the population growth at 1% per year we can assume that there are about 250 thousands (25 millions * 1%) new houses per year, which 45% are of medium segment and they have to equip themselves with 2 sets… So there is an extra 225 thousands more dish sets demanded per year and a replacement rate of 15% on these new dishes.   So, the market size is approximately 3.6 millions sets per year.

Item	Quantity
Population	100,000,000
Growth	1%
# per household	4
Households	250,000

Income	# of different Sets	Total # of sets (bought)
High	3	37,500
Medium	2	225,000
Low	1	125,000

Interviewer: On the ballpark, my estimation was that it was around 4 million.

Interviewee: Anyway, we are still missing other segments on the markets such as restaurants, hotels, offices, etc.

Interviewer (interrupts): Don't worry about that. Let's continue with this.

Interviewee: Okay, so now, we have to think whether it is convenient for you to enter the partnership. To do so I would like to do a break-even analysis of buying the machine and figure out the amount of sets that we have to sell…

[The interviewer interrupts again, since time is running low. Remember to practice good time management in interviews and take cues from the interviewer]

Interviewer: Assume that we have already done so and we figure out that we have to produce at capacity (150,000 sets per year). We don't have much time. What would your recommendation be?

Interviewee: So, given that the offer was to take the money to double production it means that you will go from 150,000 to 300,000. As this estimate represents less than 10% of the available market, his proposal at first glance seems feasible. However, I would want to know our current share versus those of our competitors in this segment. If a competitor already had 70% of the market, I might be more cautious about entering into this venture. Furthermore, if I had more time I would focus on what can be leverage from the current cost structure to assure it is a profitable proposition.

Case 6: Centralized Distribution

BACKGROUND

Firm: A.T. Kearney
Round: 2007 Summer, First
Content: Qualitative

CASE QUESTION

I was on the golf course the other day with a friend of mine who owns a chain of supermarkets and he posed a question that is still on my mind. His question was, why should he continue to centralize his company's sourcing rather than split it to procurement and distribution at the individual store level?

INTERVIEWER BRIEFING

Recommended approach: This is a pure conceptual case in which you have to come up with a number of reasons to go one why or the other. Be creative in the way you think about it, the case is open ended, but look for guidance from the interviewer if you start to go too far a field.

Key facts:
▪ N/A

EXAMPLE DIALOGUE

Interviewee: Let me take some time to think about how to go over this problem.

Interviewer: Sure, take your time. […] So, why should he centralize sourcing and distribution?

Interviewee: In order to come with an answer I would like to go over the pros and cons of centralizing and then weight them in order to come with an answer.

Interviewer: Fine with me.

Interviewee:

Pros	Cons
▪ Ability to "squeeze" suppliers by aggregating demand ▪ Flexibility to change what to deliver to individual stores based on daily/weekly demand changes ▪ Economies of scale in warehouse size, operation, etc. ▪ Reduce cost of warehouse by having it in a low cost area and not in the store, which I assume is a high cost area ▪ Local people (at the store level) are not trained to negotiate. Having them at the store level is an extra cost ▪ Etc.	▪ Local people can understand better the necessities (e.g.: because of format, size, place) for some (niche) categories ▪ If distributed directly to the store the cost of distribution is paid by the supplier ▪ There may be some products that are not bought at the centralized (HQ) level because of limited size order. Managing at the store level make it viable ▪ Etc.

Interviewer: All good reasons… but I have talked to my friend about many of those things and he keeps telling me that there may be something else. What could it be?

Interviewee: So, we have covered most things and we are still not finding the reason…

Interviewer: Yes.

Interviewee: Looking at the ideas that I put in the pros vs. cons comparison, it could be similar to the notion of some products not being bought at the HQ because of some quantities asked for an individual store. What if the supplier refuses to ship to individual stores because of limited volume? He may not have the trucks to do so in such a small volume or he may be unwilling to do so because is not profitable to do in that way.

Interviewer: You got to the point. After a couple of hours in the golf course with my friend I came to the same conclusion, which later he validated with his team as the main reason.

Case 7: Health Care in Canada

BACKGROUND

Firm: McKinsey and Company
Round: 2007 Summer, First
Content: Qualitative and quantitative

CASE QUESTION

Our client is a Canadian pharmaceutical company. Their first drug has just been approved by what is equivalent to the United States' FDA and is an asthma treatment. The client has hired McKinsey to help them assess what is the right price for this new treatment and they will also need McKinsey's help with completing an application to the government for price approval. The second step is necessary because, as you may know, Canada's government subsidizes healthcare costs and we will discuss this in greater detail later in the case.

INTERVIEWER BRIEFING

Interviewees should consider what information will be necessary to address this case and ask for data as they see fit.

- Research and Development costs for this drug are estimated to be $5 billion.
- Beyond R&D, marketing is the largest cost for a pharmaceutical. The interviewer, however, will ask the interviewee to assume that marketing costs are $0 and there are no variable costs.
- There are three segments to this market:
  1. **Basic** – 2% of the population – have a periodic asthma attack, use 1 inhaler/month
  2. **Serious** – 2% of the population – use 1 inhaler/week
  3. **Acute** – 1% of the population – use 1 inhaler/week, but attack sometimes results in hospitalization and death.
- The client's new treatment is classified as preventative. It is a pill that must be taken every day.
- Regular inhalers cost $10 each. This is the common treatment for asthma.
- Acute patients that result in hospitalization spend 1 night/year in the hospital at $1000 and the rate of death is 1%.

EXAMPLE DIALOGUE

Interviewer: First, let's discuss the possible ways of framing the client's first question – how should it price this new drug?

Interviewee: Well, there are three different methods I can think of:
- Cost based pricing – set the drug price at cost and add a percentage markup
- Value based pricing – set it at what customers are willing to pay
- Determine Minimum and Maximum prices

Interviewer: Great, now, go through the steps to solve this problem and provide a price to the client.

Interviewee: Okay, so let's try cost based pricing. I would assume that the company has both fixed costs and variable costs. Have we gathered any information from the client about its cost structure?

Interviewer: Well, what do you think would be its largest costs?

Interviewee: Given what I know about the pharma industry and the extensive R&D for drugs, I would guess Research and Development.

Interviewer: Good, R&D costs are $5 billion. What would you guess are some other key categories of costs?

Interviewee: Marketing is usually a big cost.

Interviewer: Right. For this case, let's assume marketing is $0 and there are no variable costs. [Where possible, the interviewee could have tried to anticipate this chain of questions and suggested, without being asked, the key categories of costs that might be relevant].

Interviewee: Next I would want to size the Canadian market for this drug, assuming that we will only sell in Canada. To do this, the population of Canada is approximately 30 million people. We would now need to estimate the percentage that is asthmatics?

Interviewer: There are 3 segments to this market:

> *Basic – 2% of the population – have a periodic asthma attack, use 1 inhaler/month.*
> *Serious – 2% of the population – use 1 inhaler/week.*
> *Acute – 1% of the population – use 1 inhaler/week, but attack sometimes results in hospitalization and death.*
> *Also, the treatment is preventative. It is a pill that must be taken every day.*

Interviewee: Okay, so let's assume every segment will use this drug. 30 million * 5% = 1.5 million people. However, I would expect that there would be some barriers to switching and not all potential users will switch from inhalers.

Interviewer: Okay, so now how do you set the price?

Interviewee: I want to determine the price to break-even. For a pharma, I think 5 years is acceptable.

To break even in 5 years: 1.5 million * Revenue = 5 billion (R&D)
Revenue = $3,300

Use 350 days/year for simplicity, one pill every day over 5 years = 350*5= 1,750 pills

$3,300/1,750 pills = approximately $2/pill

Interviewer: So do you think this price should be the minimum or the maximum?

Interviewee: This is the minimum because it is the break-even price.

Interviewer: Okay, let's consider the second half of the question. As I mentioned, the Canadian government subsidized medical costs, let's for the sake of this case say that it pays back its citizens for medical treatments. How do you determine how to set the price so that the government will agree to pay it?

Interviewee: Assuming that the government is paying for the current treatment, I would want to know their current spend and determine what the difference is between that and the new drug. Do you know how much the government is currently paying patients for their inhalers?

Interviewer: The cost of inhalers is $10 each. Also, acute patients that result in hospitalization spend 1 night/year in the hospital at $1,000 and the rate of death is 1%.

Interviewee: So I want to determine how much the government is currently spending on inhalers.
Basic: $120/year (1 inhaler a month), 600,000 people, $72 million total
Serious: $520/year (1 inhaler a week), 600,000 people, $312 million total
Acute: $520/year (1 inhaler a week), 300,000 people, $156 million total

Total government is spending on inhalers: $540 million/year.

Now I want to determine how much government is spending on hospitalizations.

$1,000 * 300,000 people = $300 million/year

Total government spend = $540 million + $300 million = $840 million

Over five years: $840 million * 5 = $4.2 billion

So with the new drug, we calculated the break-even at five years to cover $5 billion in R&D. With inhalers, in five years, the government is spending $4.2 billion.

Interviewer: Good, so with this information, summarize for me the minimum and maximum price.

Interviewee: *Summarize results to interviewer and state what you think the minimum and maximum prices should be. Make sure to note that the new pill is a preventative measure, as opposed to the current method of using inhalers as treatment. A good summary will be structured and go back through the steps used in solving the case. At this point you can also bring in other parameters that may not have been discussed in the case such as the price on-patent versus off-patent, or the potential larger international market for this drug.*

Case 8: International Airline

BACKGROUND

Firm: Bain
Round: 2007 Summer, First
Content: Qualitative and quantitative

CASE QUESTION

Our client is a major international airline with flights to and from the Americas and Europe. The company already operates two daily flights from A to B, offering connections to C. The CEO has hired Bain to evaluate a new route. Should they create this new route from A to C?

A

2

1 = 4,800 miles
2 = 3,800 miles
3 = 2,350 miles

1

C

3

B
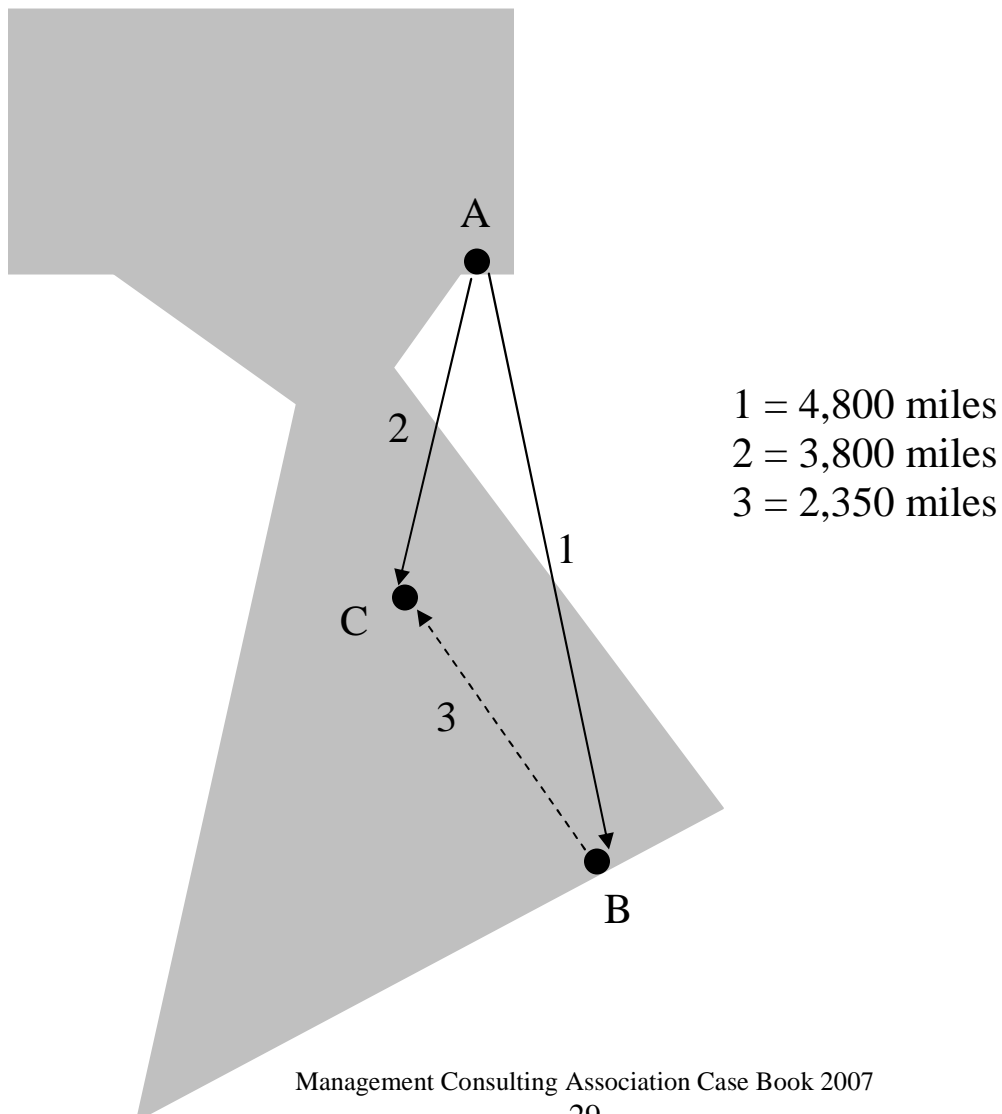
INTERVIEWER BRIEFING

Recommended approach: This is a typical Bain case. You can feel free to bring in your understanding of the airline industry as you see fit. This was a real case that the interviewer had worked on during his time at Bain. Take the time to structure your thoughts and discuss the case.

The interviewer was expecting the interviewee to structure a framework, which would look at the big picture that any MBA should have in mind about the airline industry. A strong candidate would have to arrive into final numbers as well as in a final conclusion. Some important elements were:
- First player in the market
- Cannibalization and complementary business
- Discuss trade-offs

Key facts:
o At this point there is no other airline flying from A to C, and there is only one competitor flying from A to B. B to C is a domestic route with one competitor
o Market grows with GDP
o 15% of passengers from A to B (or return) have C as the origin or final destination
o Current Load Factor in A to B is 80%
o Ticket price to fly from A to B or A to C is $600 one way
o Aircraft type:
   o Airbus 319 (120 seats) has a maximum fly range of 4,000 miles
   o Airbus 320 (165 seats) has a maximum fly range of 6,000 miles
   o Airbus 330 (240 seats) has a maximum fly range of 7,000 miles
o Costs:
   o Airbus 319 (120 seats) has a fixed cost of $41,000
   o Airbus 320 (165 seats) has a fixed cost of $62,000

EXAMPLE DIALOGUE

Interviewee: *[Summarize the case and work on a framework].* This case requires us to estimate the potential market size of route A-C, the growth opportunity, the competition as well as our client's resources. Also, any legal or governmental issue should be discussed.

Interviewer: OK. How would you estimate the market size (demand) for this route? What do you need to know? I have been working with this client for a long time and might have the needed information.

Interviewee: Although we could estimate the size of the market, it might be more reasonable to look at the current information the company has about the indirect route. I

would believe many passengers already fly from C to A by connecting flights in B, right? So I would like to find out the number of flights per day, number of passengers per flight and the percent of these passengers that actually have C as the origin or destination.

Interviewer: Very well thought. It is a smart decision to start more conservative. Our client currently flies twice a day from A to B and back. It currently operates Airbus 320 in this route, with 80% load factor. 15% of the passengers have C as the origin or destination. I can also tell you some aircraft limitations:
- *Airbus 319 (120 seats) has a maximum fly range of 4,000 miles*
- *Airbus 320 (165 seats) has a maximum fly range of 6,000 miles*
- *Airbus 330 (240 seats) has a maximum fly range of 7,000 miles*

Interviewee: This gives us $165 * 80\% = 132$ per flight or $132 * 2 = 264$ passengers/day (one way), of which 15% or 40 have C as the origin (and destination). We should have in mind that if the client offers the new route, it will reduce the load factor of the A-B route from 80% to 68%. Aside from our own cannibalization, I would expect that by offering this new route our client will be able to take customers from its competitors, right? Actually, does the client have any competition on its current routes?

Interviewer: There is only one competitor flying from A to B, but this competitor has a code-share agreement with a domestic airline that flies from B to C. From A to B the competitor flies an A330 (240 seats) daily with the same 80% load factor. Also, 15% of its passengers have C as the origin or final destination.

Interviewee: This gives us an additional $240 * 80\% * 15\% = 30$ passengers/day. Before we conclude that our client will be able to steal these customers from the competition, let's analyze the pricing points. Do you have any information of prices?

Interviewer: Both our client and the competitor charge $600/leg from A to B or A to C.

Interviewee: It is interesting to see that the passenger pays the same fare to fly from A to B (4,800 miles) and from A to C ($4,800 + 2,350 = 7,150$ miles). So basically we have the same price and potentially a faster trip. Unless we find any competitive advantage other than travel time, we could assume our client is able to steal customers from the competitor. I would also imagine that by entering into this route our client would have first-mover advantage and the competitor would not enter this route if they didn't think that it could steal share from our client.

Interviewer: This makes sense. Basically you have estimated a conservative demand. What else would you analyze?

Interviewee: We know the potential demand; although there is an expected growth in the industry let's see whether this route would be currently profitable. What do we know about the cost structure?

Interviewer: *The total fixed cost of operating A319 and A320 are $41,000/per flight and $62,000/per flight respectively. There are some variable costs, but they are marginal.*

Interviewee: Basically for route A-B the client must use an A320, but A319 is an option for route A-C. Let's analyze each route:
- Revenues from A to B: (165 * 80% * 85%) * 600 = $67,320
- Cost for A to B: $62,000
- Revenues from A to C: 70 * 600 = 42,000
- Cost for A to C: $41,000

I am assuming the client could use the A320 for the main route and A319 for the new route. As we can see, the former route will remain profitable (8%) and the new route will give a 2.5% margin.

Interviewer: *What is your conclusion?*

Interviewee: Taking into consideration that 2.5% margin is not a very bad number for the airline industry and that our assumption does not take into consideration an additional demand generated by the new faster route from C to A, the client should at least launch a trial of this new route. The former route, from A to B, will remain profitable.

Case 9: Seattle Newspaper

BACKGROUND

Firm: A.T. Kearney
Round: 2007, Summer
Content: Qualitative and quantitative

CASE QUESTION

Our client is a major media conglomerate, with radio stations, magazines and newspapers throughout the US. They have five major newspapers in five important metropolitan areas. Its oldest newspaper circulates in the Seattle metropolitan area. After 50 years of great profitability and steady market, early this year there was a strong decrease in market share and price.

The CEO has hired A.T. Kearney to help understand the new market dynamics and determine what strategy should be taken next. The CEO is also expecting us to provide advice on whether he should increase prices. How would you go about addressing this question?

INTERVIEWER BRIEFING

Recommended approach: This is a typical case for which one single framework won't be enough. The interviewer was expecting you to look at the big picture and then start thinking about the profitability issue – both cost and revenue – and asking for specific information. A strong candidate would have to arrive at the following set of conclusions:
- The new competitor targets a total different market from our client; this signals that there is an additional market that our client could consider exploring.
- The new sales price is below the cost per paper; however, our client should look at the potential for advertising revenues. These should subsidize the uncovered cost of each paper.

Key facts:
- Market Share: for over 50 years this Seattle newspaper had split the market (50-50) with a strong, but independent local newspaper. The two are well recognized for their news quality.
- Earlier this year, another newspaper entered the market, building a 50% market share in less than nine months and leaving the two former newspapers with 25% market share each. Although the two major newspapers had dropped their prices to match the new entrant's, this has not been enough to recapture the loss in market share. The new

competitor is recognized as providing lower quality news than the former two players.

- Newspapers generate revenues from sales of papers as well as advertisements.
- There is a high fixed cost to operating a news paper, which might be classified as sunk cost.
- None of the players offer subscriptions.

	Before		After		
	Client	Old Competitor	Client	Old Competitor	New Competitor
Price	$1	$1	$0.50	$0.50	$0.50
Daily Sales Volume (units)	2,000	2,000	2,500	2,500	5,000
Market Share	50%	50%	25%	25%	50%
Daily Ads ($)	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 0
Pages/day (units	40	40	40	40	20
Cost/page ($)	$0.01	$0.01	$0.01	$0.01	$0.01
Delivery Cost (% of price)	40%	40%	40%	40%	40%

EXAMPLE DIALOGUE

Interviewee: I'd like to understand a few things first in order to evaluate this market, especially what, if anything, has changed from last year. To this end, I'd like to explore the current market demand for newspapers in Seattle. Then, I'd like to understand the competitive landscape. Third, I'd like to discuss any changes to our client's management or internal processes. Finally, since we're dealing with a profitability issue here, I'd like to explore both the revenue and the cost side of the business.

Interviewer: That was a long list of things. Where should we start?

Interviewee: You said that there had been a decline in our client's market share, so let's take a look at the competitive landscape. How has the market share of its competitors changed?

Interviewer: For over 50 years this Seattle newspaper has split the market with a strong but independent local newspaper. The two are well recognized by their news quality.

Interviewee: Do they still split the market?

Interviewer: *Early this year, another newspaper entered the market, capturing 50% of the market in less than nine months and leaving the two former newspapers with 25% market share each. Why do you think that this happened, what factors are at play?*

Interviewee: The new competitor must be offering either a better product or a lower price point. What do we know about the volumes and prices?

Interviewer: *These are the numbers. What do you think?*

	Before		After		
	Client	Old Competitor	Client	Old Competitor	New Competitor
Price	$1	$1	$0.50	$0.50	$0.50
Daily Sales Volume (units)	2,000	2,000	2,500	2,500	5,000

Interviewee: Interesting, actually our client and the former competitor have increased sales volume with the entrance of a new competitor. I would imagine the new competitor is offering a different product or targeting a different market niche.

Interviewer: *That is correct. Although our client has dropped its price to match the new entrant's – and the other major competitor is always following it – this has not been enough to recapture the loss in market share. The new entrant is recognized for offering a lower quality newspaper. So, how would you explain that?*

[Interviewee should have noted the change in price and identified that this may be why there has been an increase in demand]

Interviewee: Well, there are some reasons that I can think of that might explain this phenomenon:
- After the two major newspapers dropped their prices to match the lower price of the new entrant, some of their readers could afford purchasing the two papers.
- Alternatively, potential newspaper readers who could not afford the $1 newspaper can now purchase newspapers at 50 cents.
- The new competitor captured a new market niche, one that demands lower quality news.

Sales revenue was 2,000*1 = $2,000 but now it is 2,500*0.5 = $1,250. This represents a 37.5% decline in newspaper sales. I don't think that a newspaper would have such a high profit margin as to cover this decline, lets look at Profits = Revenue – Cost. To do this I need to understand the per newspaper costs.

Interviewer: Ok.

	Before		**After**		
	Client	Old Competitor	Client	Old Competitor	New Competitor
Pages/day (units)	40	40	40	40	20
Cost/page ($)	$0.01	$0.01	$0.01	$0.01	$0.01
Delivery Cost * (% of price)	40%	40%	40%	40%	40%

* There is a cartel for distribution

Interviewee: Our client has 0.01*40 + 40%*0.50 = $0.60/paper in costs, which is greater than the sales price of 50 cents. The new competitor, on the other hand, has 20*0.01 + 40%*0.50 = $0.40/paper in costs, with a $0.10 margin over the variable cost per newspaper. Are there any fixed costs we should be considering or are these considered to be sunk costs? I would expect some heavy costs in this side.

Interviewer: Yes there are, but they are sunk. However, I can tell you that our client is still making a profit, despite the numbers that you just calculated. How would you explain that?

Interviewee: Besides paper sales, I would expect that a newspaper generates revenues from advertisements and online. We should also consider the balance between subscribers and newsstand sales. Do you have any information?

Interviewer: Yes. Neither our client nor its competitors offer subscriptions. They do not have online news either. Let me give you the ad revenues. Any thoughts?

	Before		**After**		
	Client	Old Competitor	Client	Old Competitor	New Competitor
Daily Ads ($)	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 0

Interviewee: Clearly the new competitor has not impacted the two former players' advertisement revenue. It has also not been able to generate any revenue with ads. How come? I also would want to consider that with the expanded customer base, why there has not been also an increase in advertising, since I would imagine advertisers pay per reader.

Interviewer: Usually companies split their budget of ads among the different means of communication that reach out to their target customers. So?

Interviewee: We can conclude that the new competitor has created a new market segment.

Interviewer: That is correct. So, you have a meeting with the CEO in five minutes, what would you recommend him to do? What will be your strategy?

Interviewee: I will tell him that he should raise the price, perhaps back to $1. Some reasons:
- The new competitor is not a direct competitor; it has created a new market niche of people who cannot afford to pay $1 and reads a totally different kind/quality of news.
- A price of $0.50 is not feasible in the long run for any of the players due to the high fixed cost.
- As our client already mitigates the high fixed cost, the CEO should think about creating a new product (newspaper) focused on this new market niche. The new product should be totally independent and oriented to this market. In the worst case scenario they would make money out of printing (5,000 * 0.10) but could certainly convince its advertisers to direct part of their budgets to the new product.

Case 10: Jumbo Jet

BACKGROUND

Firm: Booz Allen Hamilton
Round: 2007 Summer, First
Content: Qualitative and quantitative

CASE QUESTION

Our client is a large European airplane manufacturer that is developing a new jumbo jet, which will be able to hold up approximately 800-900 people. Parts for the plane are manufactured in multiple sites across Europe. They have provided us the following information on site production:

- Cockpits are produced in Northern Spain
- The fuselage is produced in Northern Germany
- Wings are produced in Northern England
- Landing Gears/Interior are produced in Southern France

The client has asked us to determine where it is most economical to assemble the plane.

INTERVIEWER BRIEFING

Candidate should form a structured approach to investigate the components that make up assembly, including costs and capabilities.

EXAMPLE DIALOGUE

Interviewee: Well, I would like to look into the specific costs incurred from the assembly process and also determine the capabilities for assembling the planes across different locations (labor skill and supply, etc.).

Interviewer: Ok, I like your approach. Let's focus on costs for now.

Interviewee: Great. I assume that the major costs of assembly would be transportation, labor, and PP&E. Also, I would think that there would be tax incentives to assembling in one country versus another.

Interviewer: Good. Let's focus on transportation and labor for now, as these are the most significant cost drivers. What are some of the areas that you might analyze for potential assembly locations?

Interviewee: I would look at the existing sites where our client manufactures parts, as well as other areas in the region that may have low cost propositions, such as Eastern European countries that may have cheaper labor costs than Western Europe.

Interviewer: *Let's take France as one location since it is the mid-point of the four manufacturing locations and compare it to the Czech Republic where labor is significantly less expensive than Western Europe.*

Interviewee: Well the location in France would incur less cost because the client would already have the landing gears and interior at the facility, and would have to transport the other three parts over a shorter distance. However, the labor costs in France would likely be significantly higher than those in the Czech Republic. Do we have any information about transportation and labor costs in each of these areas?

Interviewer: *Well, we have determined that labor accounts for about 70% of the total costs of assembly and transportation accounts for the other 30%. Disregard the other costs such as real estate, etc.*

Interviewee: Great. Well, since labor accounts for 70% of the cost, let's start there. Do we have any details about how much labor costs in the Czech Republic relative to France?

Interviewer: *Labor in France is 1.5 times higher than labor in the Czech Republic. What do you think that total transportation costs would be in France relative to the Czech Republic?*

Interviewee: Since these parts are so large, I would assume that a major part of transportation is actually packing and loading the pieces on a truck.

Interviewer: *You're right. In fact, the marginal cost of each extra mile transported is close to zero. The most significant cost incurred is labor costs associated with the loading of parts for transportation.*

Interviewee: I would assume that the landing gears and interior are fairly small and wouldn't incur as large expenses for loading/unloading compared to the wings or the fuselage.

Interviewer: *You're right. In fact, the interior and the gears are the easiest to pack of all the four parts and the fuselage is the hardest (most expensive). What would you recommend to our client?*

Interviewee: Well, I would recommend they assemble the plane in the Czech Republic. Since labor accounts for 70% of the total cost, and the labor in Czech Republic is about 35% less expensive than France, the client would save a significant amount of money,

assuming that the skill level is constant across the two locations. Additionally, the transportation costs would not be lower in France since the majority of transportation expense is incurred by loading/unloading the parts and the interior/gears are the easiest to pack. It might be worthwhile to analyze Germany as a potential assembly location because the fuselage represents a significant portion of our transportation costs. The transportation savings may balance out the higher cost of labor in Germany (as compared to Eastern Europe).

Interviewer: Excellent. One last question – our client knows the demand will be 200 planes per year and they are trying to determine how large an assembly facility they should build. How would you go about figuring this out?

[Candidate should ask for this data]
  - *It takes 9 months to assemble one plane*
  - *One plane requires a space of about 300 ft x 300 ft*

Interviewee: Well, we know that it takes .75 of a year to produce one plane, so we need space to produce 150 planes in the facility (200 x .75). Also, one plane requires 90,000 sq. ft. of space. So the total facility would need to be 150 planes x 90,000 sq. ft. per plane = 13.5M sq. ft.

The interviewee will now be asked to summarize high level findings and make a recommendation to the client regarding where it should produce and assemble planes and the requirements for this operation.

Case 11: Telecom

BACKGROUND

Firm: Booz Allen Hamilton
Round: 2007 Summer, Second
Content: Qualitative and quantitative

CASE QUESTION

Our client is a telecommunications infrastructure manufacturer and they have hired us to help determine if they have any excess manufacturing capacity. If there is any excess capacity, our client would like Booz Allen Hamilton to suggest a course of action to ensure they are profitable and efficient.

The client currently has plants in both Minnesota and Mexico, close to the Texas border. The plants manufacture similar products and the facilities are about the same size. The company expanded capacity by replicating their first plant (using it as a template for others).

INTERVIEWER BREIFING

Candidate should formulate a logical structure (internal vs. external factors, supply/demand, etc.) and then determine if the client has excess capacity or not. Interviewer does not offer the necessary data and so the interviewee should ask directed questions to extract the following data:
- Each plant operates an 8am – 5pm shift
- Demand is flat or declining
- Client has a relatively high market share of 80%
- Customers are phone companies and there are high switching costs
- Our client recently acquired a competitor and there are very few players in the market.
- The client is not highly concerned about new entrants because the industry growth is flat or declining, this is not an attractive market.

EXAMPLE DIALOGUE

Interviewee: I would start by looking into the company's manufacturing process to determine if they are experiencing low utilization rates compared to the overall capacity of production.

Interviewer: The company operates an 8-5 shift and is running at fairly close to 100% utilization rate. However, they have considered shifting to multiple shifts in each plant and running a 22-hour workday. What do you think the overall demand capacity looks like in this particular industry?

Interviewee: I would assume that it is either flat or declining because the US telecom market is relatively saturated, with little new customer growth.

Interviewer: Yes, that's correct.

Interviewee: Ok, well, I would now like to investigate the overall market and determine where our client sits in the industry. Do we have any information about their market share?

Interviewer: They have a relatively high market share of 80%.

Interviewee: Who are they supplying the products to? Consumers, business customers, or phone companies?

Interviewer: They are a telecom infrastructure manufacturer so their direct clients are the phone companies.

Interviewee: Does our client have any reason to believe that the market share could change dramatically? What are the switching costs in this industry?

Interviewer: There are very high switching costs in the industry. Also, our client recently acquired a competitor so they are not anticipating any big declines in market share. There are also only a few competitors in the industry with little threat of new entrants due to the flat or declining growth.

Interviewee: Given the overall macro trends in this industry as well as their specific manufacturing set-up, I believe that our client does have excess capacity?

Interviewer: Why?

Interviewee: Well, the industry is declining and there is less demand for these products over time. Also, opportunities exist to streamline their manufacturing operations with more shifts per plant across less overall plants.

Interviewer: Ok. What should they do?

Interviewee: They could close some existing plants, or they could generate revenues from manufacturing products for competitors (or for companies with similar products).

Interviewer: Looking at the first option, how would you determine which plants to close?

Interviewee: I would look at the overall cost per unit at each plant and determine which would result in the most efficient overall location. Costs could be classified into major subsets such as labor, distribution (from Mexico vs. Minnesota). I would also want to know if quality of product differs across any of the plants. Finally, it would be valuable to analyze whether our client could change their plant size and configuration to generate further efficiencies.

Interviewer: Good. Quality is fairly consistent across all of the plants and they are not looking into plant reconfiguration at this point. Labor costs are the most significant contribution to cost per unit. Given that, what do you recommend?

Interviewee: I recommend our client closes the Minnesota plants and increases overall utilization of the plants in Mexico by adding shifts.

Interviewer: What are the major risks/concerns of this recommendation?

Interviewee:
- Negative PR resulting from closing US plants
- Scalability issues (can the Mexican plants quickly increase capacity?)
- Quality issues stemming from increased production
- Reliance on one location/region for all manufacturing

Case 12: Mining in Brazil

BACKGROUND

Firm: BCG
Round: 2007 Summer, Second
Content: Qualitative and quantitative

CASE QUESTION

Our client is a US industrial conglomerate, with major investments in South America, India and China. One of these investments is a mining operation in Brazil. At this mining operation, our client produces only one metal, which is considered to be an international commodity product. This metal has hundreds of applications. In Brazil there are only two other producers.

The CEO has hired BCG to help identify new opportunities for this business as well as understand the market dynamics. He wants to know whether he should divest the mining business or invest in an additional facility. This afternoon, the BCG team is going to meet with the CEO to discuss our initial hypotheses. We have been provided the following information to assist us:

Local Players	Plant capacity (tons)	Cost/ton	Sales	
			Local	Export
Client (A)	600,000	$450	600,000	-
Competitor B	4,500,000	$420	2,800,000	1,200,000
Competitor C	3,200,000	$420	2,000,000	700,000

The world-wide production (supply) of this product is estimated to be 100,000,000 tons. Furthermore, it is known that demand for this product is greater than current supply. As a commodity, the international price (export price) is $450/ton and the local price is $600/ton.

INTERVIEWER BRIEFING

Recommended approach: This is a typical BCG case. BCG often (i) uses real life cases, (ii) presents available data upfront in a table of during the case question, and (iii) drives the interview to be a conversation between the interviewer and the interviewee. Therefore, be sure to engage the interviewer as you approach the case.

The interviewer was expecting the interviewee to first provide a structure/framework, which would look at the big picture and then start hypothesizing. A strong candidate would:
- Discuss market dynamics (local and international and supply/demand).
- Discuss the expected competitive response to any action, e.g., a price war.
- Summarize all findings in a presentation format.

Key facts: All given beforehand, but the following would help in the discussion:
o An efficient plant should have a 1,000,000 ton capacity (but, not all plants are operating efficiently), however, from this information the interviewee should be able to assume that therefore competitors are operating more than one plant each.
o Market grows with GDP.
o There is a strong demand for this product internationally.
o The competitors are probably located away from the coast, adding transportation costs.

EXAMPLE DIALOGUE

Interviewee: *[Summarize the case and work on a framework]*. In this case it is important to look at the competition (specifically, understand the different cost structure of the 3 producers), estimate the market demand and discuss the international trade environment. We should also discuss the specifics of a metal commercialization.

Interviewer: OK. Where should we start?

Interviewee: Clearly, our client is running on full capacity, but its competitors appear to have some idle capacity. Furthermore, I note from the data provided that the competitors' cost structures allow them to sell in the international market while our client does not currently export any of the products. Our client would experience zero margin if it was to export since the international price is given at $450 which is equal to our client's cost of production. Nevertheless, the local price is considerably higher than the international price, so the producers would rather sell as much as possible in the local market. Given this information, I would hypothesize that there is not enough demand in the local market.
o Competitors would prefer to sell in the local market ($600/ton) instead of export ($450/ton)
o Competitors are running with idle capacity, but we know that demand exceeds current supply

Interviewer: That is correct. But what about the international market?

Interviewee: This is a good point. You did mention that there is a strong demand worldwide. Now we have to find out why the competitors are not selling their full capacity. We can think of many possible reasons. Geographical distance, transaction costs, transportation costs, export taxes, etc.

Interviewer: They all make sense, but as we see competitors are able to export some metal, right?

Interviewee: Competitors might have operations abroad so it makes easier to export to their international facilities. Or they might produce part of their capacity close to harbors. Considering that the international price is much lower than the local one, I would expect some barriers for international trade.

Interviewer: That is correct, Brazil does have some taxes for foreign products and producers struggle with transaction costs. Let's look at the cost structure. Why do you think there is a difference in costs?

Interviewee: I could consider geographic location, technology, economies of scale, supply chain synergies, etc.

Interviewer: You mentioned some important elements. Our client has only one location and the competitors have multiple plants, each in the countryside. Our client was the first player in this market, having built its facilities 10 years earlier than its competitors. The industry has realized that a plant must have a minimum of 1,000,000 capacity in order to be efficient.

Interviewee: But our client is still making a lot of money, right?

Interviewer: Yes, enough to convince the CEO to invest in a new production facility. This would be a $400M investment in year 0 for a capacity of 1,000,000 tons with a cost of $420/ton. How would you evaluate this investment if this new production would be traded in the international market? Would you recommend this investment?

Interviewee: Basically the margin will be $30/ton ($450-$420) * 1,000,000 equal to $30M per year. By using a 10% discount rate this investment will generate $300M in total. The $400M investment would not be worth it.

Interviewer: That is true. So, are you going to advise him not to make the investment?

Interviewee: I would advise him against it unless he is willing to engage in a price war.

Interviewer: That would be the minimum price he could go to turn this investment profitable?

Interviewee: We should be cautious because a lower price would impact the current profitability. The current margin is ($600 – $450) * 600,000 = $90M. For instance, if we drop the price to $513/ton we would be losing $52.5M [($600-$513) * 600,000] from the current 600,000 ton production but generating $93M [($513 - $420) * 1,000,000] from the new production, a net gain of $40.5M. With the 10% discount the minimum profit required from the new plant would be $40M ($400M*10%). Therefore, the minimum price would be $513.

Interviewer: But if you drop the price to $513/ton, what would the competitors' reaction be? Would they also increase production? Remember, they have idle capacity and you don't.

Interviewee: That is correct, but the competitor has a lot more to lose with a price reduction. In our client's case we found out that it would lose money as the margin of the current production drops. However, the client only sells 600,000 tons right now while the competitors sell 4,800,000 tons combined. They would probably reduce their production to avoid a higher price reduction.

Interviewer: Really? So you are recommending our client to invest $800M in a 2,000,000 tons capacity plant?

Interviewee: I haven't done the math but I guess this would be too risky. I would recommend our client to invest the $400M and see how the market reacts.

Interviewer: That is a fair recommendation; after all they will be playing a game with no real expected result.

The interviewee should now expect to summarize the findings from this discussion for the client, highlighting the approach and key recommendations.

THIS IS THE LAST PAGE
OF THE CASE BOOK