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Top Consulting Interview Prep

How many rollerblades in New York City? How much does the Empire State Building weigh?

What should you do next? Are there two dogs in the world with the same number of hairs?

Why do chickens wear red contact lenses? Why do consulting companies use case interviews? How can you sell peas on the Internet? How now brown cow?

How big is the U.S. Market for Band-Aids?

How many beer bottles are currently in circulation in the United States? Why are manhole covers round?

Management Consulting Association

Guidebook 2002

Cases
Industry Overview
Frameworks
Interview Guide
Classwork

Columbia Business School

Business Type Cases (full answers)

The client is an U.S.-based wine manufacturing firm looking to expand globally. They have retained us to advise them on the valuation of a South African based wine company that they are looking to acquire. Why don't you walk me through some of the things you would consider in advising the client?

I'd like to evaluate three broad areas – the client's strengths & weaknesses both financially and from a business standpoint, industry growth trends including a competitive assessment in the United States and finally evaluate the target's strengths and weaknesses before actually carrying out the valuation.

My objective is to evaluate the vulnerabilities– need for specialized inputs or labor, power of suppliers and buyers, threat of competitive attack, need for customer service, etc. – and variabilities – historical sales growth, profit margins and expected growth trends in the industry – that our client faces. This will be critical in undertaking the actual valuation.

- *OK, that sounds like a good overview. Why don't you tell me the various steps that you would take in the valuation?*

At this stage, I felt that the interviewer was probing for the mechanics of a valuation.

Well, once we have undertaken the variability and vulnerability assessment, we can identify both a realistic worst case EBIT growth and a target capital structure for the company and carry out a pro forma financial statement projection, for say, five or ten years out. Then, we add back non-cash items, changes in CapEx and working capital and compute free cash flows.

Once this is done, we can compute a weighted average cost of capital and discount the free cash and the terminal value, which can be computed with an assumption of stable growth at the end of our projection horizon.

- *How would you calculate the WACC for the South African target?*

I'd first identify the equivalent of the long-term Treasury bond here in the U.S. We can then look at the beta for the target and using a market risk premium of 4% or so to figure out the cost of equity. I'd probably also add a country risk premium for South Africa and a size-based premium based on the market cap of the target.

- *Interesting. How would you figure out the country risk premium?*

Ideally, if there is a dollar-denominated bond available in South Africa, I'd identify a bond of identical maturity here in the U.S. and the spread in yields between the two bonds would be the country risk premium for South Africa.

- *Somehow, I don't like using a country risk premium. It seems very arbitrary. I'm not convinced how or why such a premium is applied. But I agree theoreticians tend to recommend using something like this.*

At this stage, I was not going to argue with my interviewer. I vaguely agreed with him, but thankfully we were well out of time and he said he'd love to chat with me about this later. I found out through the course of the interview that I was being considered for the Corporate Finance & Strategy practice, though I had not explicitly expressed an interest in this practice.

The client is a division of an industrial chemicals firm. They are in the business of manufacturing fibers and have had sales of $1 billion. Their concern is that the sales have been declining steadily over the past five years. Their objective is to identify three to five new lines of business with total revenues of $300-500 million utilizing existing capacity in the fiber manufacturing facilities. They have come up with a new fiber that has very good absorbency, something like 10 times its weight, which is a breakthrough in the industry. The client is looking to enter the urban pet care market in the U.S. with this new high-absorbency fiber. They want to manufacture pet care pads, sort of diapers for pets in urban areas. The client would like us to evaluate the potential of this idea, which is where you come in.

I would explore the following areas and in the process hopefully glean insights to whether or not the pet care diaper sounds like an attractive option for our client. First, I'd like to learn more about the client. Then I'd like to understand the market potential, then assess competitive trends and finally focus on the particular product in question and the client's ability to execute with regard to bringing this product to market.

- *Sounds good.*

Can you tell me more about the client's strengths?

- *Well, they are an established industrial products manufacturer, their fibers are specifically used in the fashion apparel industry and for the manufacture of cigarette filters. They've had sales in the billion-dollar range, so they are reasonably big.*

Do we know how strong their brand is in the customer's mind? How strong are their marketing skills? The reason I ask is to understand whether or not our client is best suited to bring this product to market, if there is demand for it.

- *Their brand is pretty well known, but not necessarily directly by the end customer. They have not done any marketing in the traditional sense and have no advertising experience at all.*

Oh, I see. If they traditionally have not interacted directly with the customer, how does their value chain look like?

- *Good question. They deal largely with distributors, who in turn sell the products to retailers. The retailers handle the relationship with the end customers.*

Great. I'd like to modify my original framework slightly and explore this value chain a little further. How powerful are these intermediaries, and would the client want to continue to use them in bringing the pet sponge to market?

- *The client prefers to continue using the intermediaries. They are reluctant to try things that they are not necessarily experienced in. The intermediaries know this and consequently the distributors would demand a 50% markup while the retailers would require a 100% markup.*

Interesting! Why don't I move to the next area of my original framework, market potential? Do we have any research on the size of this market?

- *Not really but how would you go about sizing the market?*

Well, I'd try to get a sense for the size of the urban pet owner market. Let's assume that of the 100 million households, 40% or 40 million households are urban households. Of these, let's assume that 40% of the households, i.e., 16 million households, own pets. I'm considering only dogs and cats as relevant pets for the product. Let's further assume that each of these households has 1.5 pets. This results in about 24 million urban pets that are potential users of the sponge in question. I don't have a good idea how often these sponges would need to be replaced. I know my niece goes through 4 to 6 diapers per day. This is probably too high.

- *You're right. Remember these are high absorbency sponges, but its not clear how tolerant pet owners would be to the smell. ☺ Let's assume that they would want to replace the sponge every other day.*

OK, that would result in 24 million times about 180 sponges a year or 4.32 billion sponges annually. Wow, that seems like a pretty big number! With a 20% market share, our client should be able to sell – assuming that there is a customer need for it – about 800 million pads annually. Before I figure out the dollar value of this market, let me try to understand if there are any competitive products in the market, how they are priced and if indeed there is a demand for these products.

- *Well, there is no major national brand out there. Local pet stores tend to sell such pads for about 50 cents per pad. The demand is quite small and sales are restricted to the local stores.*

Is our client's proposed product any different from these local brands?

- *Not really. It has much higher absorbency – that's about it.*

Hmmm. I wonder how our client hopes to differentiate this product and market it to the customer. At any rate, let me assess the dollar revenue potential that this product is likely to generate. If the product is priced at the current market levels of 50 cents a sponge, the 100% retailer markup means that the distributor receives 25 cents and the 50% distributor markup would leave the client with only a little over 16 cents per sponge. With an ambitious annual sales estimate of 800 million pads, the revenue potential is about $128 million.

- *Is this good enough?*

Well, you did mention that the client is looking for 3 to 5 product ideas with $100 million revenue potential each. This product idea meets this metric, but its not even clear if there is a customer need for the product and I'm not convinced the client has the execution quotient to bring this product to market.

- *Okay. What else would you want to look at before you can make a final go/no go recommendation?*

I'd like to evaluate the costs involved with this product launch. One thing to make sure is to ensure the product makes a profit.

- *That would be a good thing. Anyway, looks like we are out of time…*

Coming out of this interview, I was amazed at how broad the issue was and how many details there were to keep in mind. The interviewer was quite helpful in guiding me along, but it is really easy to get off track. For example, I didn't quite make the $100 million per idea client requirement till the interviewer asked if my estimate of the revenue potential was good enough. With different assumptions, I could have come up with very different estimates. I guess there is not real right answer, eh?

The client is a large pharmaceutical firm with a market cap of $85 billion. They have about 4% market share and are currently enjoying a 34 P/E ratio. The industry average P/E is about 29. Over the next five years they are looking at a healthy growth in their EBIT margins. However, for three years thereafter, the EBIT margin growth is likely to stagnate when three of their blockbusters come off patent. Subsequently, blockbusters currently in the pipeline will hit the market and their EBIT margins are expected to healthy growth levels. The CFO of the firm us to help her figure out if the three-year plateau five years out is an issue she should be worried about and if so what external options she can pursue to fix it?

I had no real idea how to proceed. I didn't have a particularly good idea about the pharma industry. So there was no particular framework that came to mind. I was going for the "groping in the dark" approach!

Interesting. Broadly, I'd like to better understand our client's position in the industry, then explore competitive developments and projected trends and finally explore some possible external options.

But let me first try to get a better sense for our client and their strengths particularly financial. Can you offer some details?

- *Sure. Our client has about $10 billion in revenues, EBIT runs at about $3 billion. Gross margins are quite high at 80% and they are totally debt-free.*

I see. What has the client typically done when blockbusters have come out of patent? I believe over-the-counter versions are one route.

- *Quite right. They have taken the OTC approach and probably will with these blockbusters as well. But this is not a financially attractive option. As soon as the drug goes off patent, its price drops to 20% of its pre-OTC price. Margins are consequently totally squeezed. Anyway, is this EBIT margin plateau an issue?*

Oh, I most certainly believe so. You indicated that the client enjoys an above average P/E. So clearly they are doing something right. I'd expect that the market is also aware of this projected trend in EBIT margins and the price of the stock probably reflects an expectation that management will do something about the trend. I would therefore strongly caution against doing nothing.

- *So what would you recommend?*

You mentioned external options. Can you clarify what that means? Mergers, acquisitions, and so forth?

- *Yes.*

I see. Can you tell me more about the industry? Is there any consolidation happening? Are there potential merger or acquisition candidates that the client has in mind?

- *Well, consolidation is something that is always happening at different levels. What do you think of a merger of equals?*

I'd say this is something we can explore if in fact there are similar trends in the industry and there is a threat of us being left behind or "overpowered." If not, then there is the anti-competitive aspect to worry about. Also I'd be concerned about post-merger integration issues. Does the client have experience with mergers and managing post-merger issues?

- *Let's assume that they don't. What types of things would advise the client to look out for?*

There are a few things they should absolutely ensure they do. First, they have make sure that any target will offer operational efficiencies that can be exploited. Then, they have to ensure that they retain and reward management talent appropriately. This talent will be key from an execution perspective and if the client wants to extract all the efficiencies of the merger, retention of management is key. Rewarding management and key officers and tying incentives to performance is therefore critical. Finally, there has to be a very clear vision articulated and tangible, measurable goals established. This is also critical.

- *That's good. What other external options come to mind?*

I'm not very familiar with the pharmaceutical industry and am not sure if there is something unique to this industry. There is nothing in particular that jumps out in my mind.

- *Are you familiar with the software industry?*

Yes, sort of.

- *Are you aware of the notion of licensing?*

Oh yes!

- *Licensing is something that is fairly common the pharma industry. The client can take advantage of their marketing prowess and brand image in the market to license potential blockbusters that much smaller firms or firms without their clout are currently developing and that will hit the market during the three years in question. This way they can generate sales to grow their EBIT margins.*

Got it.

Leaving this interview, I felt as though I had blown the interview for not having come up with the licensing option. In retrospect I probably did a reasonable job. My biggest take-away is that I should have sought clarity on what the interviewer meant by "external options." He wasn't particularly forthcoming with information throughout the interview and preferred to let me talk and think out loud. I should have pressed him for a laundry list of what would constitute "external options." I think it's perfectly alright to ask such a question and then analyze the relative merits and demerits of each option before making a recommendation.

The client is a regional retail bank. Recently, it has begun facing threats from Internet-based financial services firms and other non-traditional firms. Deposits are declining and the bank has approached us with a strategy to grow the bottom line. Walk me through some of the issues that you consider and work streams you would set up in coming up with some recommendations.

I'd like to structure the analysis along three broad areas, which would also form the work streams. I would like to better understand the client's strengths, particularly their brand equity, customer reach and their history. Then I'd like to evaluate competitive trends, products and services offered and the value proposition that these competitive firms offer. Finally, I'd like to design the capabilities that the client will have to establish in order to grow their bottom line.

- *OK. Where would you like to start?*

Could you tell me more about our client, particularly about their customers, brand and history?

- *Sure. The client is a well-established bank based in New England. They have about 3 million customers and an acquisitions strategy that has been reasonably successful. They offer a slew of products including deposits/savings accounts, small investments, credit cards and mortgages. However, they have been laggards in eBanking.*

Do we know how their customers perceive their brand?

- *Well, they are a reputed and established firm. They are known for trust and security. They have chosen to remain a regional bank and consequently customers are quite loyal.*

I see. I'm particularly intrigued by the fact that they are laggards in eBanking, which segues nicely into the next area I'd like to explore – competition. Can you tell me more about the competitive threats they are facing?

- *Competition has intensified both from traditional firms, particularly other regional banks and also from new, non-traditional firms. As you've probably guessed, Internet-based firms are able to offer a better perceived value proposition to customers and the client feels that there is a strong threat of losing loyal customers.*

I think I have a good feel for the client's competencies as well as the emerging competitive threats. Do we know if the client is looking for new product ideas?

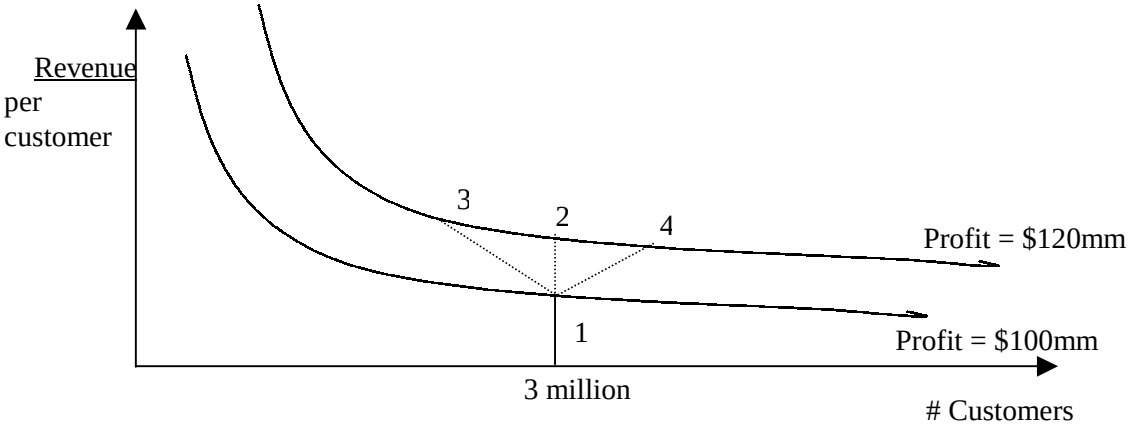
- *Well, that would surely be one area to explore. It's not clear if that is the primary focus of the client. How would you help the client identify how to prioritize the various options?*

I'm sure this is not totally comprehensive, but I'd identify the major product lines the client offers customers. For sake of argument, let's look at three products/services – banking products like savings accounts, brokerage services and say, retirement accounts. For each of these products/services, I'd then identify the different channels available – branches, the Internet, etc. For each of these channels, I'd undertake an analysis of value versus convenience. This would

help segment the various products/services that the client can offer into various levels of service quality and value proposition.

- *That's interesting. What next?*

With an approach I just described, I'd like to move to the final area that I wanted to discuss – capabilities. If we rank-ordered the client's customers by revenue they contribute and plot a chart of revenue per customer and the number of customers, the chart would probably look something like this. I'm not entirely sure if the curvature is exactly as shown. Let's assume this is illustrative for purposes of discussion.



If the client currently makes $100 million in profit, with 3 million customers, they are at point 1 on this chart. Their objective is to move to points 2, 3 or 4 at a higher level of profit, say $120 million. Now, point 2 represents increasing the revenue per customer without bringing in more customers. We can think of this strategy as increasing the number of relationships or products/services that the client has with its existing customer base – a customer loyalty enhancing strategy. Point 3 represents an attritive strategy – eliminate unprofitable customers from its base so that the number of customers goes down, while revenue per customer goes up. This is a cherry-picking strategy. Point 4 represents an acquisitive strategy where the client increases its customer base while simultaneously increasing the relationships or products/services with its customers. Each of these strategies will result in the bottom line increasing, but the choice of the strategy will be based on the clients core competencies and the competitive assessment we have undertaken, along with a consideration of how the industry is likely to evolve in the future.

- *This is great. So if you were in a meeting with the bank's CEO, what would your recommended course of action be?*

Based on our discussion, my preference is to recommend the strategy that leads to point 4 – grow the customer base as well as deepen the relationships with the customers to enhance loyalty. This will probably be most successful in the long run. I must admit that this recommendation is based on our 20-minute discussion and wonder if there are other areas I haven't explored.

- *The point of this exercise is not to come up with a right answer. You did a good job.*

Thanks.

I'm sure you know that the campaign for the Presidential elections is currently underway. Both Bush and Gore have proposed a instituting a change to the retirement benefits policy for all employees whereby every employee makes a contribution ranging from $500 to $2000, depending on who wins, to a retirement account and the savings grows tax free till the employee retires. We have been approached by a client that runs a large mutual fund to help answer two questions they have: Is this a big opportunity? What are the various possibilities and challenges they would face?

I'd like to explore three broad areas in helping answer the first question – the dynamics of the mutual fund industry, incremental savings entering the mutual fund market and finally regulatory or exogenous factors affecting the mutual fund industry as a result of changes to existing policy.

First, can you tell me more about the size and dynamics of the mutual fund industry?

- *Sure. As you may be familiar, mutual fund companies solicit investments from individuals, retirement accounts of various firms, etc. They then invest these monies to create and manage a well-diversified portfolio for a management fee. From the investors' perspective, the creation of such a portfolio minimizes the risk.*

Got it. How big is this industry?

- *There are, of course, a large number of players. The total assets under management itself could run in the trillions of dollars, so this is a very large industry.*

Do we have a sense for how much new money enters the industry? I ask since this will directly help determine if the proposed policy change will be a big opportunity for the industry or not.

- *I see what you mean. Based on our internal studies and analysis, last year about $170 billion was new money or additions to assets under management in the mutual fund industry.*

OK, let me now move to sizing the incremental savings that is likely to enter the investment pool of dollars. I'm going to make some assumptions, please stop me if any of them are outrageous or unrealistic. My objective is to size the employed population of the United States. Let's assume that individuals between the ages of 20 and 60 are eligible to be employed. If the life expectancy in the U.S. is, say, 80, and if the population is uniformly distributed by age. I know this is a big assumption, but for sake of this discussion, let's make it noting that in a real-life engagement, we should be able to get a fairly accurate estimate of individuals in this age range from any number of databases.

- *OK, that sounds fine for now.*

So, about half the US population, or about 125 million, is eligible to be employed. I'm going to assume that the labor force, that is people that are actually employed is about 80% of this number. We are basically excluding homemakers, students, etc. who would be in the 20 to 60 age

range. So we are looking at a labor force of 100 million. Figuring that the unemployment rate in the U.S. is running at about 5%, the actual number of people employed is about 95 million.

- *Why don't we just ignore the unemployment rate for now and assume a round number of 100 million?*

Oh, this would make life easy. You indicated a range of $500 to $2000 for retirement account contributions. Would these be recurring annual contributions?

- *Yes. Let's also assume that, since we don't know who's going to win, the contribution would be $1000 on average.*

Great. So the increase to the investable assets would be $100 million times $1000, or $100 billion. Wow, that sounds like a substantial increase, given that last year the new addition to assets under management was $170 billion! Are there any other regulatory issues or exogenous factors that would govern or restrict how these assets can be invested?

- *There are some stipulations, but let's not worry too much about them for now.*

Excellent, in that case, our response to the first question would surely be that this is a substantial opportunity for our client in aggregate.

- *I'd probably agree that this is a substantial opportunity in aggregate. But how would you go about determining if is this a profitable opportunity?*

I think I see where you are going. You mentioned our client charges some sort of management fee for services rendered. How much is this fee and what types of expenses does the client incur?

- *Good question. The client charges a 1% management fee on assets under management. Simplistically, let's assume that administrative expenses on these assets like mailing statements, etc. is about $10 annually, while other operating expenses add up to about 10basis points.*

Interesting. On every $1000 invested then, we make $10 in revenues but have $10 plus $1 or $11 in expenses. That doesn't look profitable.

- *No, it does not, does it? Would you still think that this still a substantial opportunity?*

Well, it doesn't seem that way. Hmmm…Let me take a couple of seconds to think through this.

- *Sure.*

Ah, I think I see what may be happening. What happens in the second year when the assets grow based on the return earned? If we assume the $1000 grows to, say $1200, our revenues now look like $12 but expenses are only $11.20. We begin to make a profit. If we know how long a customer keeps the investment, we can present value the cash flows to figure out a lifetime customer value to the client. Then there's the new $1000 that the customer would invest the

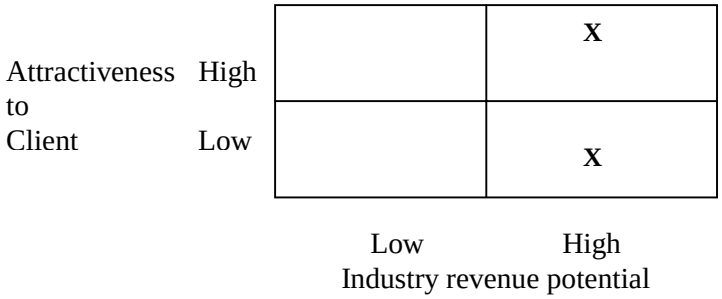
second year. So it does appear to be profitable, though I'm not sure how it compares to profits currently.

- *Bingo! It is a profitable business. Right now, the size of each customer's account is pretty substantial. It tends to run on the order of tens of thousands, so that the profit margin is much more attractive. We seem to be running out of time. Can you quickly summarize for me what opportunities and challenges the client faces, given our analysis so far?*

Sure. There are a number of opportunities and along with it. Among the opportunities, the first is cross selling the mutual fund opportunity to customers of the brokerage and other services. This would result in enhancing customer loyalty and also increase switching costs, leading to higher customer retention. Second, emphasizing convenience, sort of the one-stop shop for financial-services idea, can enhance the client's value proposition to their customers. On the challenges front, the most critical is probably competition. If indeed $100 billion additional funds are likely to be invested, every financial services firm is going to want a slice of the pie, which only underscores the need to cross sell and increase customer loyalty. This is something the client is going to have deal with.

- *Great. Let's assume that you are riding down an elevator with the CEO of the client. And he wants to know what we think.*

I'd draw him a 2 by 2 matrix, with industry revenue potential on one axis and attractiveness of this opportunity to the client on the other.



I'd argue that the opportunity has a lot of potential for the entire industry. However, the attractiveness to the client needs further analysis. There are a number of interesting opportunities that this policy change presents, but also a few challenges that the client will have to overcome in order to reap the full benefits.

A matrix is always a good thing to draw; you already sound like a consultant! ☺

A liquor manufacturer that is 100 years old. Started with whisky. Now whisky accounts for less than 5% of sales. Multibillion dollar company.

Overall sales of whisky up 1% per year over last 20 years. Client's sales have tracked that. Last year, however, overall sales up 2%, while client's whisky sales down 15%.

Why? What should they do?

Did company do anything differently last year than it did in the previous 20 years?

- *Price has not changed. But, 5 guys, master blenders, implemented a new formula that reduces cost per bottle $0.25. There were no changes to packaging and no testing of new formula, but they assured management that there was no noticeable impact on taste. However, 20% of one customer segment, the "loyals," that constitutes 5% of all customers but 45% of sales, have noticed the change and are "extremely angry."*

.20 * .45 = .09

So, if angry loyals have stopped purchasing our whisky, sales will have decreased by 9% (since price has remained constant). But, before we can say that this was a harmful move for the company, we must look at the bottom line, profits.

- *Okay, the current contribution margin per bottle is $4.*

So, the margin before must have been $3.75, all other things equal.

Before: 100 * $3.75 = $375
After: 91 * $4 = $364

Therefore, the change in the formula has not only hurt sales, but also hurt profits.

But, the remaining 6% drop remains unaccounted for. Do we know if the market for whisky has changed in the last year? For example, I know that with the rise of cigar bars that whisky has become more hip recently. Is our client's whisky targeted to this customer segment?

- *Actually, it is not. The whisky market is divided into high end, middle segment, and low end whiskies. Our client competes in the middle segment. It turns out that at these whisky bars, people will buy high end whisky to drink straight, but are satisfied with low end whisky for mixed drinks. Last year sales in the high end and low end whisky segments grew, but sales in the middle segment declined. What does this table with market information tell you?*

Well, it looks like sales in the middle segment, where our client competes, declined by 4%. I am puzzled, though, 2% of decrease remains unaccounted for, assuming our market share has not declined. In terms of the competition, have they done anything that might have resulted in our loss of market share?

- *Maybe, what could they have done?*

They could have launched a new advertising campaign? No. They could have increased their penetration in retail distribution? No. Hmmm…. they could have lowered their price?

- *Bingo. In fact, our client's competitor lowered their price from $12 a bottle to $11 a bottle. If I told you that our client only had one competitor in the middle segment, taking a look at the table again, can you tell me how much their market share increased in percentage terms? Assume that our client had 50% and their competitor had 50% of the middle segment before last year.*

Okay. Well, let's assume that the total market 2 years ago was 100. We had 50 and they had 50. Last year, our sales decreased by 15% and the overall market decreased by 4% in size:

.15 * 50 = 7.5 decrease in our sales to 42.5

.04 * 100 = 4 decrease in market sales to 96

96 – 42.5 = 53.5 current sales for our competitor

So, they increased their sales by 7% in absolute terms. Their market share increased by 5.7% to 55.7%. Our client's market share dropped by 5.7% to 44.3%.

- *So what should the client do?*

The first thing they should do is change the formula back to appease the angry loyals.

- *How do let these people know that they have returned to the old formula? Remember, there was never any change in packaging, so this is not like Old Coke vs. New Coke.*

Well, you should do targeted marketing to these loyals to let them know. This might be difficult, but will be necessary in order to move the whisky upmarket, which is my next recommendation. Also, if the company wants to make their whisky a more premium product, they should not answer the price cut of its competitor with one of their own. Moreover, cutting price to regain market share would reduce profits even further:

Now: 42.5 * 4 = 170

After: (42.5 + (.02 * 50)) * 3 = 130.5

This is intuitive: we would be cutting out margin by 25% to achieve an approximately 2% increase in sales! The key for our client going forward, then, is better marketing, which makes the brand relevant in a changing market.

This case highlights that multiple things can happen at once to create problems for a company. When doing calculations, you can assume 100 to aid when looking at the effect of percentage changes in market share or quantity sold.

A client's company operates 1 passenger and 2 cargo ships in the Baltic sea, between Finland and Germany. The ships are old and need to be replaced. The choices before him are to continue with the same configuration, 1 passenger and 2 cargo ships, or to go in for 2 hybrid ships, which can handle both cargo and passengers.

First, I enquired about the current operating environment. Then I examined the costs and benefits of each option and also checked for potential showstoppers for operating the new hybrid ships.

- *The current market for shipping:*
  - *The market's lucrative. There's not much competition.*
  - *Passengers – Profits $1000 per person per round trip on average. Use the ships for recreation; people stay inside since it is in the Baltic after all. The cruise leaves every other evening at 6 PM and arrives at the other port at 6 AM, and heads back to the homeport at 6PM, again getting back at 6 AM.*
  - *Cargo – Profits $2000 per trailer unit for a round trip on average. The cargo ships leave daily, one from each port, at 6AM and reach at 6PM.*

How would the hybrid ships operate?

- *The hybrid ships would leave daily, one from each port, at 6 PM and reach at 6AM.*

At this point I asked about showstoppers: change in cargo loading time, passenger experience due to the presence of cargo, etc.

- *There would be no problems in changing the cargo loading time from 6 AM to 6 PM for the hybrid configuration. The cargo would be in the hold, and won't harm the passengers' experience, which is mostly indoors anyway, since the Baltic is a cold, cold place and no one wants to stay outdoors.*

Capacities?

- *The passenger ship has a capacity of 1000 people, though occupancy is 600. The cargo ship has a capacity of 120 trailer units, with utilization of 100.*

Growth potential?

- *The market's mature.*

Costs for buying /building, and operating the ships?

- *The operating costs are the same. The hybrid ships cost $250 million each to build, the passenger ship costs $200 million, and the cargo ship costs $100 million each.*

I asked for a few minutes to check the numbers.

- *You need some more information (heart sinking). The capacities for the new ship are as follows:*
    - *800 passengers, with occupancy of 500, and 100 trailer units, with utilization of 90 units.*

At this point I ran the numbers. I considered the profits in each case over a 2-day period.
In the old situation, there would be one round trip for passengers and 2 round trips for cargo, giving total profits of $1 million. In the new situation, there would be 2 round trips for passengers and 2 round trips for cargo, for a total profit of $1.36 million.
Thus, in the new situation results in ~$65 million extra profits annually. Given that the extra cost for the new configuration is $100 million, the client can easily recover his extra investment and increase the ROI.

- *Good. That's what we told our client and he made lots of money!*

Other points covered: In the new situation the passenger cruise operation is more dependent on traffic from both ports. In the old situation it could depend on traffic from just one port. So if the economy in one country goes down, then the new operation is less profitable. However, given that the ships operate between Germany and Finland, and not with the ex-USSR states, the chances of an economy imploding are small.

Given that the actual problem was easy, I think the additional comments about dependence on economy and other such "soft" analysis helps. Feedback was that I cracked the case.……..

A publishing company has 2 divisions, one that prints SEC disclosures and the other that prints mutual funds' prospectus. In the first division, the shareholder communications are printed and sent to all the shareholders. It entered the mutual fund prospectus business 10 years back, and this has helped with revenue growth. It had revenue growth of 25% over 5 years and then 15% over the next 5 years. The CEO wants to know why the rate of growth has slowed and what he can do about it.

Could you give me some more information about the client's business? Does it produce content, maintain a distribution list, solicit firms directly, etc.?

- *The client's services are retained by Investment Banks. When a company needs to access the capital markets or make SEC disclosures, it is required by law to send the information to all its shareholders. The company uses an Investment Bank in order to access the markets, and the bank gives the information to the client, who prints it and hands it to the company, which in turn mails it to the shareholders. So the client does not produce content or maintain its own distribution lists.*

Ok, let me start by looking at the revenues. R = P*Q. Could you tell me a bit about the pricing in this market.

- *Prices have been constant.*

Prices have been constant… this indicates that the quantity of prospectus printed has declined. However, given the bull market, the overall number of investors has grown, which should have resulted in an increase in the number of prospectus printed. Could you tell me about the client's market share?

- *The market share has been constant.*

Then the other option is that companies are communicating to their shareholders in different ways. Have more firms started using the Internet to communicate with the shareholders, some service like ProxyVote.com?

- *Actually the case is in 1998, before online shareholder communication was possible. So ignore the effect of the Internet in this case.*

Ok, so no Internet effects… but the prices have gone down, which then means that the quantity of shareholder communications must have gone down. However, this doesn't seem reasonable since the number of investors has increased, and the number of stock, bond offerings etc. has also increased. Can you tell me about the quantity of shareholder prospectus booklets printed?

- *Your reasoning is correct; the number of booklets printed has gone up.*

The quantity has increased, the price has remained the same, but revenue growth has decreased this doesn't make sense. Could you show me the revenues for the 2 divisions?

- *Mutual Funds prospectus: $100 million in 1988, $300 million in 1993, $600 million in 1998.*
- *Shareholder communications: $500 million in 1988, $1 billion in 1993, $1.7 billion in 1998.*

Ok, so the decline in revenue growth is due to the shareholder communication division. Hmmmm…. Quantities have increased and prices have stayed constant….. How does the client charge customers?

- *The client charges them on a per page basis.*

A per page basis! This means that the number of pages in a prospectus have gone down.

- *Right.*

What could be the reasons behind it? You've mentioned that the client doesn't have any control over the content. Could the customers be reducing the amount to be printed to control costs?

- *Shareholder communication standards are mandated by the SEC, so the customers have to print what is required by the SEC.*

Then it looks like the SEC is the cause of the reduction in number of pages per prospectus.

- *Yes. In 1993 the SEC mandated the easy English usage rule, which forced companies to reduce all the legal jargon that was difficult to understand. So what options does the client have to raise revenue growth rates?*

R = P * Q. The options before the client are to raise prices or to raise the quantity printed. It could achieve the latter by gaining market share, increasing the number of pages, or by expanding into other lines of business.

- *Ok, examine the options for me.*

Before I do that I would like to find out a bit more about the competitive landscape. Does the client have any differentiator? What is their competition like?

- *There are 3-4 firms that offer the printing services. There is not much of a difference between them. Investment banks use one or the other's services for a while and then switch to another one if there is some personality clash. Prices are the same and so is the service.*

Ok, based on that information, let's take a look at the option of raising prices. The client's services are required when firms access capital markets, requiring shareholder communication. When firms access the capital markets, they hire Investment Banks, and I would guess that our client's costs are much less than those of Investment Banks. Is this true?

- *Yes, it is.*

Ok, then raising prices is a viable option. But I would like to check for competitive reaction. The Investment banks could choose a competing firm. However, you did mention that price usually doesn't come into the picture, so I feel that raising prices a bit is a viable option. The next one is to gain market share. Is there any way that our client can differentiate itself? Can it build a relationship with some Investment Banks and provide better service?

- *Not really, there are few options for doing so.*

Ok, so that rules out the market share option. What about printing more pages? While the content isn't under the client's control, it could play around with the font size, formatting to increase the number of pages.

- *No. Everything is mandated by the SEC, including the format.*

So that option is ruled out as well. So other than raising prices, the client can increase revenue growth rates by entering other markets, say the market for printing annual reports. It is similar to the mutual funds' prospectus market and can leverage its existing connections with forms, Investment Banks.

- *Ok. What about entering the publishing of something entirely different, like textbooks?*

That's also viable, though I feel that the annual report market might be closer to its competency, give it's mutual funds prospectus printing division.

- *Good.*

Should have been more structured, split up the 2 divisions from the beginning itself.

Your client is a major pharmaceutical company, which has been approached with the following business proposition. You have been asked to lay out how you client should evaluate the opportunity:
A small hospital in West Virginia has developed a total cardiovascular health program for its outpatient population. The program has been in place 3 years and has been highly successful in improving the cardiovascular health status of the patients as measured by several parameters. The hospital would like to "sell" this program to other hospitals for a fee, but could not undertake such a task on their own. Instead, the W. Virginia hospital would like to license the program to your client, and your client would market it to other hospitals.

Ok. I want to make sure I'm addressing the key issue here—the client wants me to develop a methodology for evaluating this opportunity to license a cardiovascular health program from this hospital and market it. The client doesn't want me to come up with a final Go/No Go answer.

- *Correct.*

Do you mind if I take a few seconds to think a bit about the problem?

- *Sure. Go right ahead. We'll start when you're ready.*

I would present my methodology for evaluating as a series of very basic Yes/No questions. Of course to answer each question we'd have to go into more details, but I'd like to first lay out the broad framework.

- *OK. I think that's an excellent way to go about it.*

First, does this program actually work and can it be applied with similar success in other hospitals. Second, what is the potential NPV of this opportunity. And third, are there other opportunities available to your client that would create a greater return on their investment. If the answer to any of these key questions is no, then the client should not pursue this opportunity.

- *Very good. So why don't we go through each of the questions and what I'd like you to do is to address the key issues you'd consider.*

First of all, having had some experience with research on patients with cardiovascular disease, I know that study results are not always straightforward. For instance, I would want to know which parameters were improved—was quality of life improved, was overall survival rate improved? Also, I would be concerned that the results from the study on patients from this one hospital in W. Virginia could not be extrapolated to other patient populations in other settings.

- *So what would you recommend to the client based on these concerns.*

Since the client is a pharmaceutical company, I would guess that they have a fair number of scientists that could look more carefully at this one hospital's results and decide if the program could be successful if widely marketed.

- *That's fair. How about the next question, evaluating the NPV.*

Well, obviously we'd have to look at the cash flows each year. That's going to require some knowledge about the licensing agreement that would be place with the hospital.

- *I don't want to get into details regarding the agreements, or even specific numbers for revenue. Let's try to keep this discussion as "high-level" as possible. What would be the major sources of revenue for your client if they pursued this opportunity?*

The main source of revenue would be hospitals paying a fee for the rights to use this program, which conceivably could be on a subscription basis, per-patient, one-time… the possibilities are endless.
Also, one thing I didn't consider is that if the program calls for specific types of medications, such as ACE-inhibitors, beta-blockers that the client makes, this might present a major "cross-selling" opportunity and boost market share for specific pharmaceuticals.
On the down side, and perhaps I'm being a bit too cynical about pharmaceutical companies—if the client is more involved with drugs required during coronary by-pass surgery and this program was actually successful and kept people from needing by-pass surgery then the client would, in a sense, be cannibalizing its sales of coronary by-pass drug sales.

- *That is very cynical, indeed! Your client actually has some ACE-inhibitors on the market that very well could be incorporated into the program.*

Again, staying at a very high level, and looking at the costs—the licensing fee paid to the W. Virginia hospital would be a major cost, and again, it could be structured in countless ways. Beyond that, my client would incur costs to market the program to hospitals, so there would be a marketing expense. However, if there is a core competency that Pharmaceuticals have developed over the years it might actually be marketing so this would be right up the client's alley. In fact, if the client already has a strong hospital-based sales force they could very easily be used to sell this program.

- *Anything else you want to add to the NPV question?*

Yes—well two things really.
One, if the client were to get involved with a program like this that promotes health overall, I think it could have a very positive effect on consumer perception. Right now the pharmaceutical industry as a whole has been receiving very poor publicity for a variety of reasons, so any positive publicity for this company would be worth something—it may be difficult to quantify, but I think it would be significant enough to consider.
On the other hand, if the program is promoted and it turns out that patients begin doing much worse (for some reason that was over-looked earlier) in the long-run, there is the possibility of materially damaging the client's reputation as a company that delivers safe health care products. If the complications resulting from this program very serious, the client may have to consider the possibility of law suits and damage payments.

- *Should we discuss the final major question—What other opportunities does the client have?*

Sure. I think this is pretty straight forward. The client may have several other opportunities that it is considering at the moment. Some of these projects might have better returns, carry less risk, and perhaps fit better with the client's core business of selling drugs.

- *OK. That's fine.*

This was one of my smoother interviews. Because I have a background in health care it was very easy to discuss this pharmaceutical case. We went on to talk about the program for another 15 minutes, but not in a "case" format.

Our client is a major provider of long-distance telephone service in the United States. It owns a subsidiary that is a communications satellite company – in the business of launching satellites and then marketing (selling or leasing) the transponders on the satellite to companies or to phone service providers. The subsidiary has proposed a $400 million expansion involving new satellites, and the client would like to know whether this is a good investment or not. The satellite subsidiary has not been making a return on capital up to the parent company's standards, and the client is not even sure if it should be in this business – they may want to sell it. What do you tell them?

Okay, clearly the first question is whether or not to keep the business – before investing $400 million, you'd want to know if you were going to keep owning the subsidiary. So the first question I'd have would be to find out how profitable the company is and whether its profitability can be improved. This might include making the investment, but it might not.

- *Good. Let me tell you about their performance last year. They had $50 million in revenues, and $48 million in cost, for a profit before taxes of $2 million. The parent doesn't think that's a good return.*

Where did the revenues come from?

- *$40 million was from annual leases for 20 of the firm's 100 transponders; these do not include service charges. $10 million was from annual service charges on the 80 transponders used by customers outside the parent company, including both the 20 that are being leased out and 60 transponders that were sold before the satellite was launched – something that satellite companies frequently do to raise capital in the expensive development and launch phases of the business. 20 of the company's 100 transponders are used by the parent company (the client) for their phone service, and the subsidiary receives no revenue for that.*

Okay, well the first thing that comes to mind is that the subsidiary's revenues should include the value of the services provided for free to the parent company – because the parent will have to pay for them if the subsidiary is sold. So, the parent uses 20 transponders, which apparently have an annual value from leasing of $40 million. Then there's also the service charge on each transponder, which is $10 million/80. So that's a total value of $45 million in annual revenues that the subsidiary is providing the parent. So, in fact, the subsidiary's revenues should be more like $95 million. What about the subsidiary's costs?

(Note: I made a math error here, and didn't notice it until later. The service charge on each transponder is $125,000, and for 20 transponders it should have been $2.5 million, not the $5 million I said).

- *The costs include $28 million for tracking and otherwise operating the satellite, and $20 million that the parent company is charging the subsidiary each year for 5 years to cover the cost of a satellite that was destroyed upon launch a few years ago.*

What? Wasn't it insured?

- *Satellites are a very risky business – 1 in 7 of all new satellites fail when launched – and thus satellites are frequently insured for far less than their value because insurance is very expensive. In fact, there is a 10% chance of failure over five years for every satellite in operation.*

Wow. Okay, but the loss the subsidiary suffered when the satellite failed was a one-time loss that should not affect current income – it's a sunk cost, and should have been taken as a one-time charge rather than a recurring expense. It shouldn't even be considered when judging the subsidiary's profitability. Therefore, the subsidiary had revenues of $95 million on costs of $28 million – that's a very profitable subsidiary, and they should definitely keep it!

- *Good. That's exactly right. Let's jump ahead. Say we tell the client this, and our further analysis says that the $400 million investment will be as profitable as the subsidiary claims it will be. But the client still doesn't think they should be in this business, and that they think they want to sell. What factors should we consider?*

The first thing is that they'd be losing a lot of future revenue, even though they could get much of it in a sale of the subsidiary. However, there are other considerations. For example, the parent uses those 20 transponders – would they be able to get the same service if the subsidiary were separate? Do they need to keep the ability to expand their own satellite use if there are too few satellites to keep up with demand? Would they be able to get as good a price?

- *Well, assume that the satellite market is fairly commodified, and that they don't need to own a satellite company to protect their usage – they could get transponder leases for the same price from any number of providers with the same quality of service, and there's no shortage expected at all.*

Okay, then there's the question of whether it's a good idea to take the risk that a competitor might buy the firm. If the future of telecommunications is moving more towards cellular and satellite-type communications, then maybe they want to keep the subsidiary in case technology makes it important to own one in the future, or to deny that capability to the competition.

- *Fine. So you tell them all this, and it makes sense. But what if they still say that they want to sell the subsidiary. What could be promoting that?*

Hmm. Maybe they need capital for their core business, for the long-distance business, and they don't want to go to the markets. Maybe they just want to pare down the business to focus on their core competency, and they think that both companies can do better as separate entities rather than joined – like AT&T spun off Lucent.

- *Anything else.*

Can't think of anything.

- *That's good. The reason they still wanted to sell it despite its profitability was really that the long-distance business is a fairly steady business – the returns are small but low-risk.*

Satellites are very risky, and the parent company felt that their shareholders were too risk-averse to be comfortable with it. Essentially, they saw that they had a different risk/return profile from their subsidiary, and decided that the two weren't a good match.

(Leaving this interview, I realized how dumb I had been to miss the implications of the high-risk data that he had given me when discussing the subsidiary's finances. The lesson is not to discount anything the interviewer mentions – I latched onto the services the subsidiary provided to the parent, which was good, but did so to the exclusion of the more important risk factor. In fact, I realized that he had given me enough information to calculate the cost of the risk. This only compounded the fact that I had gotten the math wrong earlier. What it proves, though, is that some errors are okay, and that it's tough to judge how interviews go – it turns out that this interviewer recommended that I be hired!)

The client is a major pharmaceutical company. It has two new drugs in development, both of which are prescription treatment-type drugs (as opposed to preventative drugs) for osteoporosis, a disease that affects older women. The development period for new drugs is ten years, but the last three years – which involve testing – consume more than half of the cost. Thus, the client wants you to decide whether to test the two drugs, test one of the drugs, or to abandon the drugs altogether.

- *First, however, I'd like to ask you to think through two problems for me. One is, what is the size of the potential market for osteoporosis, and two, how do you think the markets for preventative drugs and treatment drugs differ?*

Okay, to begin with, let's estimate the size of the market for osteoporosis drugs. I'll assume that we're only looking at the United States for the moment, so the population of the U.S. is about 270 million, slightly more than half of which is women. So say there are 135 million women in the U.S. I think osteoporosis begins to be a concern in women over 50, so we need to figure out how many women are over fifty.

- *Just estimate broadly.*

Okay, well, my guess is that about 25% of the population is over 50, so that's about 35 million potential customers – and we should remember that as the population ages, more people will fall into this category, so potential customers will increase. Naturally, for a treatment drug, we would then need to get the rates of incidence (to find out what percentage of women in the correct age group actually develop osteoporosis) and whether that is trending up or down.

- *That's good, and it leads into the next question. How would the size of the market be different with a preventative drug?*

Well, the number of people willing to take a preventative drug would depend on several things. First, the randomness of the disease – I don't know much about osteoporosis, but if there's a clear high-risk group, and few others get the disease, then those people are likely to be customers but people outside the group are not. On the other hand, if the disease is really random in whom it strikes, then more people are at risk, but with a lower risk for each person. Thus, people would make their decisions based on the cost of preventing the disease balanced against the consequences of getting it. So, if there's a treatment available that minimizes the problems associated with getting the disease, then few people will take the prevention. On the other hand, if the disease is not treatable and has severe consequences, many people will want to take preventative measures. Then, it'll come down to very pragmatic factors – is the drug easy to take – I mean, is it a simple pill every morning or is it several pills a day with restrictions on diet, etc? Will it be covered by insurance? Are there side effects? If the side effects are severe, they will cancel out the benefits of preventing the disease!

- *So tell me what the differences would be in marketing a preventative drug versus a treatment drug, and what factors would affect the sales volumes of each.*

(Here I took a minute to sketch down some items in two columns).

Okay, I'd say the first difference is going to be in whom the target for advertising is. Patients already suffering from a disease will go to a doctor, so doctors will be the ones making choices among competing drugs. For a preventative drug, however, the patient will likely have more influence, because even if it's a prescription drug, they may or may not choose to take it, and they may find one drug more convenient than another and thus make a choice (while patients suffering a disease are likely to put up with inconvenience to make themselves feel better).

- *Okay, how would that change the marketing?*

Well, my guess is that doctors will respond most to effectiveness – because they will likely be more scientific and have done more of their own research (even if it's just talking to colleagues) about a drug than patients. So that's the most important thing to stress. Patients, however, will be less attuned to the science behind the medicine, and will also be very conscious of side effects, convenience, etc. So a treatment drug would be mainly advertised in medical publications and similar areas, with a stress on the effectiveness of the medication. A preventative drug, however, would likely be advertised more broadly, targeting the group that might be at risk for the disease, and stressing the awful consequences of getting the disease and how easy and safe it is to take the prevention.

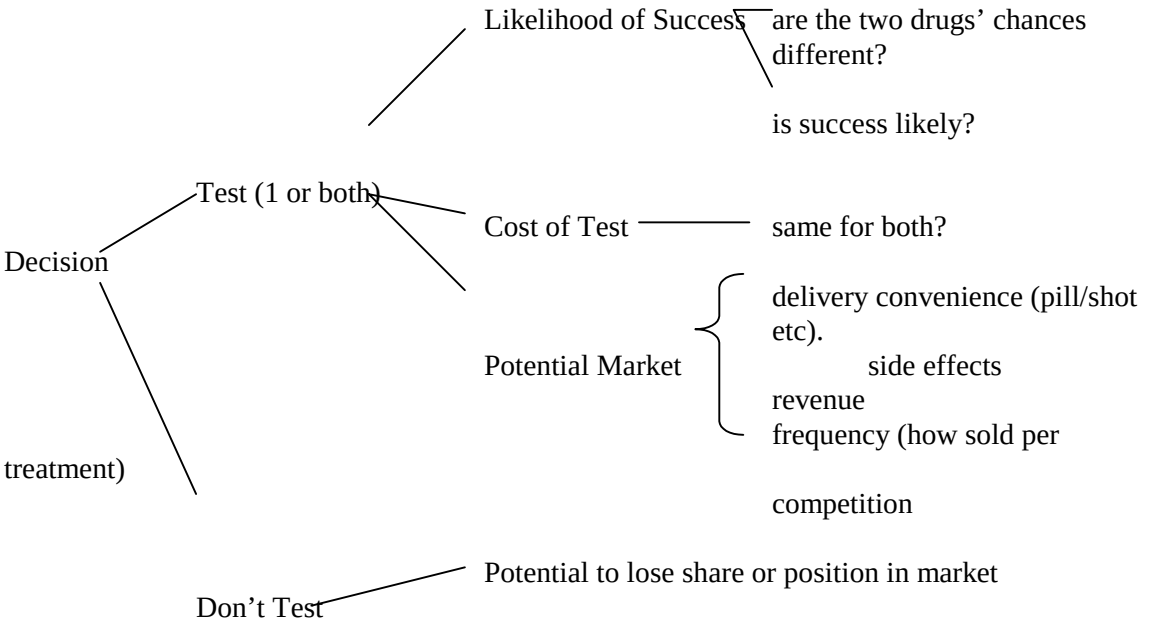
- *Okay, that's good. Let's talk about the client's problem. Should he spend the money to finish developing the two drugs?*

Are they treatment drugs or preventative drugs?

- *At the moment they're treatment drugs, although they could be preventative drugs in the future. The normal pattern is for drugs to come out as treatments, because longer testing is required to prove value as a preventative. So the drug will be released as a treatment and then the company would continue testing to see if it has value as a preventative. But consider the shorter-term possibilities as a treatment drug.*

(At this point, I drew the following McKinsey-style "issue tree." I basically then read it off to him).

Okay, first I'd look at the consequences of the two choices – to test or not to test. For the decision to test, I'd want to look at the likelihood of success, to find out whether success was likely in general and whether the two drugs had different chances of being successful. (Etc., etc. for the whole tree).



- *Okay, those are all important issues. Is there one thing you'd want to find out first?*

Yes, I'd want to find out about competition - are we the first company to develop a treatment for osteoporosis? If not, is our treatment significantly different?

- *That's a crucial question. No. In fact, both drugs we're producing are essentially the same as drugs our competitors already have out on the market?*

Are we producing generic drugs that will cost less?

- *No, we would not compete on price.*

Does anything else distinguish our drugs? More effective? Fewer side effects? Anything?

- *No.*

How well have the existing drugs done?

- *They've done very well. They're the dominant treatments of the disease.*

So we're just going to duplicate their drugs to enter the market?

- *Yes. Our drugs will work in essentially the same way as the existing drugs.*

Okay, so to be successful, we'd have to differentiate our product somehow, or maybe our size in the market would allow us to gain share just by entering the market – because of purchasing arrangements, brand name, etc.

- *No, the competitors are just as big as we are. How would you go about differentiating a product that nearly duplicates an existing product in the market?*

Well, one way would be advertising, so that you could potentially make patients ask for our drug over the others. Another way would be on cost, but we don't want to do that. We might have certain distribution channel advantages – contracts with hospitals, insurance companies, drugstores, etc, to exploit to help.

- *Anything else?*

Ummmm. (I think he was looking for a specific additional point, but I couldn't think of anything else. So he let me off the hook).

- *Well, that is okay. What would your recommendation be?*

It doesn't seem like it's worth investing all the money when there doesn't seem to be a clear way to steal share from the existing products. On the other hand, a big provider or drugs may not want to be left out of a particular market, for fear of losing other markets to a competitor with a full range of products.

- *That makes sense. What if I told you that we found out while doing our research that a small start-up company on the West Coast was developing a new type of treatment that would essentially make the existing treatment obsolete?*

What are its chances of being a technical success? And when would it come out?

- *We are fairly certain it will work if the firm can get financing to undertake the expensive last three years of development. We even know how the new drug works. They're about to begin that right now – so it'll be at least three years until it reaches market.*

Then, first of all, I'd probably cancel testing of the existing drugs immediately even the possibility that the drug will become obsolete adds to the problems of the crowded marketplace and makes it a bad investment. If we're fairly certain that the drug will succeed, it's unlikely they won't be able to find someone to finance the testing.

- *What would you tell the client to do?*

Well, he could do a few things. If there is a chance that the start-up will get delayed in bringing the new drug to market, we could use what we know to develop it ourselves and beat them to market. But they've got a seven-year head-start on us, if our development takes the standard ten-year period. We could try to hamper their development somehow – perhaps using our size in the market – but that wouldn't work for long anyway. They're a small company?

- *Yes.*

And the client is a large company with lots of resources?

- *Yes.*

Well, then maybe they should buy the start-up – that way, the start-up would get its capital, and the client would have a new drug that would trounce the competition in only three years.

- *Good. That's what we told them, and that's what they did.*

Your client is a book club, the type of club where you get 4 books free and are committed to buying 5 more books at retail price, which is usually less than at a bookstore. Also, there is a book of the month you get unless you return the monthly card. Their profits are going down. What do you do?

Well, to address profitability I would look at revenues and expenses. Under revenues we have price and quantity. Have the prices changed that you pay for the books or the prices you charge to customers?

- *No, both prices have remained stable.*

OK, then I would look at quantity sold. I would imagine that this is the problem. With all the competition in the industry, like Amazon.com, Barnes and Noble.com, traditional bookstores that have been expanding, adding coffee shops, etc, books on tape, libraries, etc. I would say that overall demand for books hasn't decreased, but that your demand has, is this correct?

- *Yes, that is correct. You are forgetting one competitor.*

Other clubs?

- *No, actually I am thinking of another.*

I am not sure.

- *Actually I am thinking of stores like Sam's Club and Wal-Mart. OK, what else would you look at?*

Well I would also look at expenses. I would say there are four main costs:

1. Actual cost of books
2. Acquisition cost of customer
3. Cost of keeping a customer
4. Shipping Costs

- *Good, except actually shipping costs are considered a revenue because they charge more to customers than they actually pay.*

OK, Well the other things are costs. You have said that the price of the books has not changed. What about the acquisition costs?

- *How do you think they acquire customers?*

Well, I joined a CD club similar to this and I often see ads for these types of clubs in magazines and newspapers. Has the price for these ads increased?

- *In a way, the actual price has not changed, but how do you think the prices may have changed?*

If fewer people are responding to the ads, then in a sense the ads are more expensive.

- *True, how would you calculate this?*

Well if the ad costs $10,000 and 10,000 people respond, then the acquisition cost is $1 per person. If now only 5,000 people respond, then the acquisition cost has increased to $2.00 per person.

- *Yes, and as a side note, how would you estimate the size of the book market in the US?*

There are 250 million people in the US. Taking out infants and illiterates I would narrow that number to 200 million. I would say on average each person buys 4 books per year. That would be 800 million books at say, $20 a piece, for a grand total of 16 billion per year.

- *OK, we are out of time.*

Your client is an American party-plan selling company, which sells power tools through hosted parties. Tupperware is the classic example of this type of selling. The company has a small core of full-time corporate marketing staff that recruits consultants, who are independent contractors. The consultants recruit hosts, who hold the parties. The hosts invite purchasers to their parties to buy the power tools. The hosts are compensated with a free gift and discounts on their purchases. The consultants get a percentage of their hosts' sales. In addition, the consultants can recruit up to four layers of other consultants and get a portion of their revenues. The company started eight years ago and has had explosive revenue growth. Recently the rate of growth has started to slow. (See graph below for their revenues.) The client has asked you two questions: what is the factor slowing growth, and how can they improve the situation?

I would examine the four levels of selling to see where the problem is: purchasers, hosts, consultants, and central marketing. Let's start with purchasers. For them I would ask whether the average frequency and size of purchase has changed.

- *Good. The purchaser behavior has not changed—on average they buy as much and as frequently as before.*

Okay—then it seems like the problem is that we aren't recruiting enough new purchasers. Let's look at the levels of purchaser recruitment. Are the hosts' behavior changed? Are they having as many parties with as many people as before?

- *Yes—nothing has changed there.*

How about the consultants? Are they recruiting as many hosts as before?

- *Yes—nothing has changed there.*

Okay—are the consultants recruiting as many other consultants as before?

- *No—the number of consultants being recruited has dropped, both with corporate marketing and via other consultants. Why do you think this might be?*

I could be because the consultants don't have much incentive to recruit other consultants beyond the first 2 layers. If each consultant gets 10% of the sales of the consultant's they recruit, then by the fourth layer, $1 in Consultant D's sales turns into $0.10 for C, a penny for B and a tenth of a penny of A—so A doesn't care if D does well or even exists. Perhaps we need to increase incentives for the consultants by giving them more of a stake in increasing sales.

- *Okay—but the incentive arrangement hasn't changed—during the history of explosive growth we had the same incentives in place. Why aren't they working any more?*

Hmm. (I'm stumped.) Well the key is to get new people—maybe the group of consultants that we have has just run out of new friends to recruit?

- *Yes—it turns out that they have basically used up all the raw material in their area. Almost everyone who is interested in doing a power-tool party recruiting have already participated. So now, what would you recommend?*

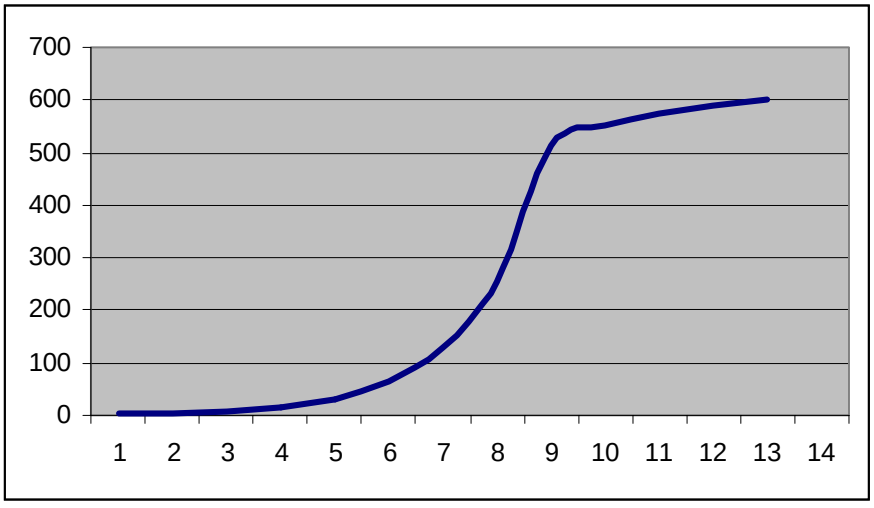
Well, they should try and spawn out into new populations. Maybe they should look at the map of their consultants and see if there are areas in the US that they haven't covered. Then if it looks like New Mexico, for instance, isn't well covered, they should either direct corporate marketing efforts in that area, and/or give extra incentives to consultants who recruit other consultants in the target area. You could look internationally.

- *What would you look for in international expansion?*

Well, I would look to see areas where DIY (do-it-yourself) was flourishing. For instance, I know that the UK has a very big, high-growth DIY market, and because of the common language, the UK is often less of a hassle to move into that other countries.

- *Yes. Let me tell you what happened with this company. It turned out that party-plan sales companies usually are based on fads, and so they grow and then burn out. The top-level employees then move onto another party-plan company selling another product. We proposed international expansion, and researched a few countries. It turns out that party-plan selling is illegal in China, but very common and accepted in Latin America.*

In retrospect I think that the compensation for the four levels of consultants was a red herring, and I fell for it. I should have been concentrating on things that had changed since their sales started leveling off.



Soybeans are a commodity. 70% of all soybeans are used for chicken and pig food. It is a very efficient source of energy. Another use for soybeans is splitting it up into soybean meal and soybean oil. 80% becomes the meal and 20% the oil. Many soybeans are grown in South America, but demand for the meal and oil is growing in Asia. I am trying to decide if I should process the soybeans into meal and oil in South America and ship to Asia, or if I should ship to Asia and do the processing there. What should I consider?

Well, you need to look at the cost differences between processing in the two places. I think the major costs would be

1. Labor
2. Overhead
3. Distribution once in Asia
4. Transportation

Would the labor costs be less in either of the two areas?

- *No, both areas have relatively cheap labor and much of the process is automated.*

I assume the overhead, i.e. factory, machinery, etc. would also be similar in the two areas?

- *Yes*

And would the distribution be different?

- *No, once the product is there, the distribution to the rest of the area would be the same.*

I must be missing something then, because if the whole soybean is used to make meal and oil, there wouldn't be any difference in the weight of the two products and no difference in shipping costs.

- *How would you verify that?*

I would call a shipper and get a quote.

- *OK, assume now I am the shipper.*

How much will you charge to transport soybeans from South America to Asia?

- *$10.00 a ton.*

OK, and how much will you charge to transport oil and meal?

- *Well oil travels in a different type of ship because it is liquid, and is $20 a ton. The meal is $10.00 a ton.*

Since 80% is meal and 20% is oil, the shipping cost would be $8.00 for the meal and $4.00 for the oil, for a total of $12.00 per ton. This is more expensive then shipping the beans so I would recommend shipping the soybeans and processing them in Asia.

- *Is this $2.00 significant?*

You mentioned that soybeans are a commodity. Usually in commodities small cost advantages can have dramatic results.

- *Maybe, how would you know if the $2.00 is significant?*

Well I would look at other costs, such as quality issues or intangible costs such as pleasing the government, etc. I would compare these other costs to the $2.00/ton.

- *OK, but what else is important to consider? Does the margin matter?*

Yes, I just assumed the margin is small because this is a commodity, but maybe this is not the case. If the profit on one ton of soybeans is $10.00, then the $2.00 savings is significant. If the profit is $1,000.00 then the $2.00 is probably not that important of a savings and the intangible or other costs would determine where you would want to process.

- *Good.*

A grocery chain in New England is considering offering an Internet delivery service (i.e., groceries can be ordered via the Internet and delivered directly to your home). Including the client, there are three main grocery chains in the area. One of them has already entered the Internet market. The only other grocery store currently offering Internet delivery service in the U.S. is a Midwest store. Should the client enter this market? If so, what issues would they face? If not, how should they protect their market share?

I would focus on three main factors: competitor's strategy, consumer demand, and the cost of running this service. I would decide whether to enter the market based on these findings.

First, let's look at the regional competitor already in the market. When did they begin their service and how successful have they been to date?

- *They began about 6 months ago and approximately 1% of their sales are from the Internet. However, they are forecasting that number to grow. Of course, we can't know for sure what will happen.*

Have your stores experienced any reduction in traffic over these last 6 months?

- *Well, perhaps a very small drop, but it's hard to say.*

Can you tell me about the competitor's pricing through the Internet; are prices the same or higher than those in the retail stores?

- *Actually, prices have been mixed with no noticeable trend. Honestly, I think they are still floundering to see if they can justify a premium.*

[I'm getting the hint to move on…] I see, so it seems that we can't be sure based upon the competitor how successful this project may be, nor can we accurately forecast what the competitor's strategy going forward will be. Why don't we move on to consumer demand. The competitor's sales of 1% via the Internet is small. This could be because the trend is just starting to pick up or consumers are just not interested. I think I would want to conduct a survey of the client's current customers to assess their level of interest in the service. This is instrumental to determine the market size as well as to assess the threat of cannibalization. Additionally, I would want to survey potential new customers as well.

- *That's interesting…how would you identify these people*

Perhaps we can obtain a listing of residents in proximity to each of our stores and cross reference them to credit cards used, "Price Club" membership, checks received, etc. In this way, we can determine who is not shopping at our stores and find out if they would use the Internet service. I would also use the survey to determine if consumers are willing to pay a premium for items purchased through the Internet to help with the pricing strategy. Based upon the responses, we can determine the potential market size figuring in cannibalization and pricing. Next, I would focus on the costs of running the service.

- *Good…what kind of costs do you think the client will incur?*

Well, there is the cost of the server and maintenance of it, delivery and "order processing" personnel, insurance for the delivery people and inventory warehousing costs. My main concern in cost is the inventory. The client needs to assure not only that the retail shelves are stocked, but now also that there is inventory for the delivery service. The problem becomes, where to store the inventory…

- *You're right, that's a big concern. We were thinking that the client could store inventory at each retail store, use the current warehouse distribution centers or build a warehouse specifically for the Internet service. What are your thoughts on these options?*

I think the answer to that depends on the time frame. If the client decides to move forward with the service, initially I think it would be wise to use the existing warehouse distribution centers, provided that they are strategically located so that groceries will reach consumers in a timely fashion and that they have additional capacity available. Building an additional warehouse is costly: the building itself, new personnel, training costs, etc. Unless there is a sustainable and sizable demand for the service, I don't think these costs can be justified. The client would be wise to use what they currently have, wait and see what the longer-term demand for the Internet service is (eliminate the "fad" buyers) and then determine if a new warehouse is actually needed. I don't like the idea of using retail stores because inventory storage merely takes away from retail selling space. In addition, retail stores probably don't have the capacity to store inventory for themselves and the Internet delivery service.

- *Hmmm….well, what should the client do?*

In sum, the client needs to determine the market potential, cannibalization and the cost of running the service. If there seems to be at least some demand and there is extra capacity in the distribution centers, I think the client should at least try the service for a little while. It won't be too costly for them and this way, if the trend does begin to pick up, the client is ready for it.

If the demand seems low or the client decides to not pursue the opportunity, they do need to be careful about protecting their market share. Perhaps they can do that by emphasizing the shopping experience at a retail store. They can run commercials showing that it is more pleasant to roam the aisles in search of your favorite foods, rather than trying to recall what you like by staring at a computer screen. They can also use the surveys to determine if there is anything about their current retail stores that can be improved to keep the customer in the store, such as music, cleanliness, staff, etc. In this way, the client can meet the consumers needs in the retail store and entice them to stay.

- *Well, that's a great analysis…we actually did this case and took a very similar approach.*

Our client is a major pharmaceutical company based in the U.S. with international reach. They are known in the industry for their cancer drugs. Recently, the company has experienced a decline in sales growth and is considering a new business opportunity. The U.S. market has many private companies that focus solely on cancer care. The client wants to own and operate a chain of private cancer care centers in China. These would be "out patient" type centers where patients could come in for treatments; long and short-term stays are possible. How would you evaluate the attractiveness of this opportunity?

I would evaluate the market for such a center in China: demand, competition and regulation. I would also assess the profit potential of the opportunity and consider if the company can take advantage of its strong reputation.

To assess the demand for the cancer care center, we would need to determine the number of people in China with cancer.

- *How would you estimate that?*

Well, we can look at the number of people currently being treated through cancer care units of hospitals, private care, etc. Alternatively, we could estimate the percentage of the population with cancer by looking at affliction rates across various countries and then multiply by the total population of China.

- *Ok, let's say that this is a large number and it is growing…what next?*

Well, I want to look at the competitors in the market. You said the U.S. market already had a lot of cancer care centers; I'd want to find out who the major competitors are in China.

- *Actually, there are no cancer care centers like this currently in China; it would be a new concept. Who do you think the competitors would be for our client?*

I would assume hospitals, nursing homes, private nurses. Also, China has a history of treating ailments through herbs and other natural substances; these old world physicians are probably a major competitor.

- *You're right. When we worked on this project, we found that a significant number of patients were being treated under these methods. Let's say there is still room in the market for our client to enter despite this. What else would you look at?*

Well, then it comes down to the profitability of the centers. Profits are comprised of revenues and costs. Let's look first at the revenues, which are comprised of the number of treatments and the price per treatment. Since the center would focus strictly on cancer, I would assume the quality of the service would be better than the competition. [Interviewer nods yes]. Therefore, we could probably charge a premium for the treatments.

- *Oh? Do you think you can? Who is paying for the treatments?*

Hmm…you have a good point. Here in the US, the patient's healthcare plan covers the cost of the treatment. Can you tell me about China's medical care policies? Do healthcare companies insure consumers?

- *Actually, in China the government pays for all healthcare. In fact, the government has predetermined fees that it will pay for all kinds of treatments. They will not pay for more than that amount.*

I see. So our client cannot charge a premium and expect the government to cover the expenses. At the same time, since our client is providing premium service, I would expect that their costs are higher than those of hospitals, etc. Our client may not even be able to cover the cost of the care they want to provide through the predetermined rates. [Interview nods yes.] Ok, so now we have a different scenario. I think the client needs to assess if there is sufficient demand amongst the wealthier segments of the Chinese population for a cancer care center.

- *How would you determine the size of this new market?*

Well, I think we can first segment the population of China based upon income and focus in upon the top income levels. We can then apply the percentage of cancer incident to this number to estimate the number of potential cancer patients in the selected segments. Perhaps we can calculate the cost of serving each patient and fixed costs to determine a breakeven number of patients. We can compare this breakeven number with the total potential cancer patients to determine the market share the client needs before they can turn a profit. Hopefully, this market share is reasonable and the client can move forward.

- *Well, you've covered most of the points that we looked into. Great job! Our client actually did move forward with the opportunity and was very successful.*

Your client has developed a revolutionary product. It is a transporter machine that can take anyone (or anything) placed in it from NYC to London in 10 minutes. (This machine is similar to the contraption on Star Trek where the person is "beamed" to the location desired) How would you price one trip?

There are three things to consider: demand for the product, the client's cost and the alternatives available for transportation. Can you tell me about the size of this machine? I mean, can you only transport humans or can you also transport, say, an automobile?

- *It's rather large, but there are seats that are very spatiously laid out. Let's stick to humans and perhaps small packages.*

Ok, well, I would think that most of the demand for this product would come from human usage and not from the packages. Because of technology, documents can be faxed, e-mailed, etc. which are also quick methods of transfer. Only larger packages or original documents needed in 10 minutes would comprise the demand on the package size. I'm going to focus on the human side.

- *That sounds reasonable. How would you assess demand from people?*

Well, 10-minute travel time to London is very appealing; the only other alternatives are to take a regular air flight (7 hours) or to take the Concord (2 hours). Since the client's transportation machine is much quicker, I would imagine that we could charge at least some premium over either alternative. Therefore, we are probably looking strictly at the business traveler or very wealthy individuals. I would further narrow the business traveler market by assuming that only top executives would use this machine. I don't see many Wall Street analysts taking the Concord! To estimate this number, I would determine the number of top executives at all publicly traded companies and add to that executives at larger, privately held companies. For the wealthy, we can probably take the U.S. population and estimate the number of people in the top income brackets. Would you like me to go through these estimations?

- *No, let's say we've done that and now you have a total market size estimate. What do you want to do next?*

Well to develop a pricing strategy, we could use a number of methods. We could estimate the costs and then include a markup. Otherwise, we could take the price of an alternative product and determine the value of the extra benefits our client's machine offers. Of course with either method we need to recognize the tradeoff between price and the number of trips demanded, as well from an economics perspective the marginal cost and revenues.

- *Ok, I don't want to get into a quantitative discussion. Can you expand upon what the extra benefits of using the machine might be and how you assign a value to them?*

Sure! I guess the main benefit is the timesaving the traveler obtains by the using the machine. Additionally, perhaps the actual ride, seating, etc. are more comfortable.

- *Let's concentrate on the time. Tell me different way you would value an executive's time?*

Well, you could look at the total compensation vs. total hours worked to determine an "hourly" wage. Or, you could try to link the revenues of the business to the executive to determine how much revenue is generated by one hour of his/her time. [The interviewer is still waiting for more ideas] Hmmm…you can probably argue that the additional time can bring in new revenues as well, so use an estimate of how much more money can be generated with the extra time (new deals/contracts, etc)..

- *That sounds great – thanks.*

[This was definitely a case looking more for creativity and "out of the box" thinking more so than analytical skills. I have heard that during second rounds, BCG uses each of its interviews to test for a different critical skill. In this interview, it was testing creativity. The case part of the interview lasted less than 15 minutes]

Your client designs, manufactures, and markets a full line of bicycles. The company's sales and profits had been growing until three years ago when its profitability flattened and began declining. Why did this happen and how can the client fix the problem?

We'll start by examining elements of the profit equation:

Profit = (Price x Volume) – Costs

I'd like to assess whether revenues (price x volume), expenses, or both are the source of decreasing profits. Can you tell me how much revenues and expenses have been increasing or decreasing?

- *Revenues are growing roughly at the same rate as before the downturn. Expenses are increasing disproportionately, however.*

So we need to determine the source of increasing expenses. Are cost increases due to operating or administrative activities?

- *Administrative costs are growing, but operating costs appear to account for the bulk of increased expenses.*

Which components of operating costs – fixed or variable – are increasing?

- *Fixed costs are growing but variable costs appear to account for the bulk of increased expenses.*

Which components of variable cost – direct or indirect – have been increasing?

- *Both have been growing, bicycles have become more sophisticated, with better materials and components. However, the increasing cost per bike has been comparable to the growing price/revenue per bike. Indirect costs are increasing disproportionately.*

Which components of indirect variable costs are responsible – materials or labor?

- *Allocations of indirect materials are about the same (usage per bike has remained about the same). However, allocation of indirect labor appears to be the big problem.*

Why are indirect labor costs increasing? It must be that laborers are spending more time on activities not directly related to the manufacture of a bicycle (or maybe sitting idle more). Are there bottlenecks in the system? In other words, has work-in-progress inventory been increasing?

- *Yes it has. When you look at the factory floor, you see many bikes waiting around. What do you think the bottlenecks result from?*

It could be from capacity constraints.

- *No, it's not capacity related – there's plenty of throughput available. However, much time appears to be spent nowadays in setup-resetting paint booths, welding jigs, dies and presses, etc. Why do you think this has occurred?*

Increased setup time can result from either an increasing number of setups per bike or increasing time per setup. Has time per setup increased?

- *No, it has actually decreased as workforce has improved setup tools, jigs, etc. In addition, workforce turnover and labor relations are all fine.*

Then the problem must be the result of increased setups. That would make sense since you said earlier that bikes have been getting more sophisticated with better materials. There are probably more material options for bike buyers to choose from, forcing manufacturers to produce a greater of bike varieties. This would cause an increase in the number of manufacturing setups that were required.

- *That's correct. In addition, at the time of profit decline the industry was trending towards increased specialization in bicycles: touring/mountain/racing/hybrid/etc. This company had responded with rapidly proliferating product lines, leading to increased number of setups and lower volume per assembly run. What are some things the company can do to try to alleviate this problem?*

They could try to rationalize product lines, and try to increase shared components across model lines. Also, greater volume on each production run may yield better results.

- *Good job.*

NOTE: The key to this case is methodically dissecting the cost structure for the company, and knowing what the components of cost are (i.e. cost accounting).

There is a $250 million German company that makes diesel ship engines. They make 27 engines per year. They have 90% of the German market share. This past year they posted a loss of 30 million. The two questions I would like you to answer are:
1) what are the causes of the loss and 2) what are the options for this company.

Since this company posted a loss, one or both of the elements of profit – revenues or costs (Profit = Revenues - Costs) – must be to blame. Either revenues are down, or costs are up, or both. But, I won't be able to analyze the case without understanding the general business first, so I have some basic questions to start with:

Is the company operating at capacity?

- *Yes.*

What are the engines used for? Are they being replaced by other technology?

- *The engines power ships and are made based on blueprints supplied by a design house that the company pays a licensing cost to. The engines are not going to be replaced anytime soon, and are so similar that they are commodities.*

[A few more general questions revealed only non-relevant information about the company and the industry. Time to get specific.]

Let's start with Revenues. Have revenues decreased?

- *No.*

Has demand decreased?

- *No.*

Have prices gone down?

- *Not substantially.*

Hmmm. That sounds suspicious. Let's come back to that. Moving on… Costs. Have costs at the factory been increasing?

- *No. In fact this company has just built a new modern factory taking advantage of all the cost savings of better production processes and automation. Labor costs have in fact gone down as well.*

Hmmm. That's good – labor costs in Germany are very high, that was my next question. What is the cost structure of the company?

- *60% are materials, 20% labor, 10% something else (I can't read my notes), 5% licensing, and 5% other. So what are the causes of the loss?*

[Now, let's think. Quickly. Profits are down, but the Rev-Cost=Profit equation seems not to be yielding that much more info. Think 4 Cs. We've already learned about the company, costs and customers – no major changes there. So what's up with the competition?]

Has market share declined?

- *Yes. Market share used to be 100% of the German market.*

[Ha Ha!] Has this German company been benchmarked against its competition?

- *Yes it has.*

Do we know the cost structure of its competitors?

- *Yes we do. Competitors have 55% materials costs, and 5% less labor costs (See, we knew those labor costs would be important)*

[Now stop. Think about what you have. $250 million – costs = -$30 million. $280 million in costs, right? You can also figure out what the competitors' costs are. So you know how much profit margin they are making. (Use 100 as the revenues figure as a simplifying assumption (the costs are in percentages anyway). You can figure out that the profit of the other company is 18 million. Now, you know that labor is a cost factor. Yes, we visited it once, probe some more.] Can labor costs be reduced further?

- *Not really. The labor is in a union, and the company just negotiated a better deal for themselves, and it is extremely unlikely that labor costs can be reduced further.*

[Now the biggie: material costs.] Why are the competitors' material costs so much lower? What allows the competitor to gain a reduction in materials?

- *Volume discounts.*

How many engines does the competitor make a year?

- *150.*

[Ding Dong. 90% German market share with 27 engines. 10% market share – 150 engines] Where is the competitor located?

- *Korea.*

You now know that there is no way the German company can increase sales enough (within Germany) to stay in business, or reduce costs enough to stay in business or reduce prices. It looks grim.

So to answer the second question – choices. The company can either: build more capacity and try to sell engines outside Germany (in order to take cost advantages of higher volume), make another product, form a "buying consortium" with other companies that use the same materials in order to get the volume discount, or sell the company to a competitor.

[There may be other choices, but time was up. In retrospect, although this wasn't a glamorous case, it forced me to think quickly, crunch the numbers quickly to get a sense of the scope of the competition's edge, and think about the national and international situation of trade and competition.]

We just finished a post merger integration project between two mid-sized pharmaceutical companies. Each of them has broad product portfolios consisting of only branded or patented prescription drugs; neither company sells OTC drugs. The combined company's sales are the largest in the world, comprising 10% of the pharmaceutical drug market. All organizational aspects of the merger are complete (new positions have been assigned and assumed). The new Head of Development comes to us and asks if we can analyze the combined Development Portfolio. He is certain that some of the projects in Development can be eliminated; others he feels are blockbusters and should be fast tracked; others are middle of the road type products that may be successful and can continue through the normal development process. He wants our team to identify the appropriate product portfolio. FYI, here is what the development process looks like:

R&D ➔ Pre-clinical ➔ Clinical ➔ FDA Approval ➔ Launch

Each step in this process can take months or years to complete. Additionally, the number of products in each stage also decreases. For example, there may be 200 products in R&D, 75 in Pre-Clinical, 50 in Clinical, 20 in FDA approval and 5 in Launch.

To identify the ideal portfolio, I would analyze consumer demand, competition, and the expected profits and risk of each product in development.

First, I would identify what ailment the product is for and try to determine the total number of people facing this illness. I would determine the current market size for the illness and project it out to the appropriate number of year(s) the product requires before it can be launched. This will give us an understanding of the total market size for each product.

Next, I also want to look at what the competition is doing. In the pharmaceutical industry, being the "first" to offer a particular drug can give a company a competitive edge; once physicians begin to use a drug, I would assume it is more difficult to make them switch to a new drug unless it offered other benefits as well. Therefore, it is important to concentrate on what the client's competitors have in their development pipeline and their timeline of release relative to ours. I would also want to try to understand the potential reactions of competitors to our client's portfolio decisions.

- *Ok, let's say we've looked at the market size and the competitors, what's next?*

Well, we want to identify the profit potential of each of the products as well as their riskiness. Based upon the availability, reputation and pricing of competitive products, I would determine the market share our client could expect for each product. I would then make pricing assumptions based upon the costs incurred and competitors' prices to forecast revenue streams for each product.

- *What are the different costs involved?*

Well, there are all research, development and testing costs incurred prior to launch. Once a product is approved by the FDA for launch,…well, let's go through the value chain:

Approval ➔ Manufacturing Costs ➔ Sales & Marketing Expenses (training/education of physicians) ➔ Distribution ➔ Customer service

The costs for each product can then be subtracted from the revenue to determine profits for each year. Then, we must take the present value of the profit streams to determine the total profit potential, using an appropriate rate that considers the riskiness of the product.

- *Ok, let's say we've done all the research and have an enormous Excel spreadsheet that has total costs and revenues by product. What would you do? How do you make your decisions?*

Well, we can calculate profits as total revenues less costs. One missing factor to consider, as I mentioned earlier, is the riskiness of the product. I would speak with the scientists working on each product to determine the probability of the product actually being launched. Then, I would calculate the expected profit; that is, (Probability of success) * (Profit Potential) + (Probability of Failure) * (Potential Loss). The potential loss is the total of the costs incurred prior to launching the product. [I actually drew a decision tree here showing the two branches of failure or success. BCG loves graphs, charts, etc.!] I would then select the top expected profit products, considering competitive positioning and timelines as we discussed earlier.

Your client is the third largest toy manufacturer in Europe and has come to you because their sales have been stagnant or even declining during the last few years. Sales had been rising before. Why are sales like this? How can the client improve the situation? Which elements would you like to analyze?

[This candidate was applying for a position in Europe. U.S. applicants won't be expected to know population sizes of European countries, for example.]

(Ed. note: You will notice that in this case the candidate jumped immediately into asking questions rather than setting out in detail his method of approaching the case. Some firms recommend, however, that whenever appropriate you should first lay out your framework. The candidate got the job offer, nonetheless).

How has the industry growth been during the past few years?

- *The growth has been pretty flat.*

What is the client company selling?

- *They are currently the top 3 leaders in traditional toys, aimed at:*
  - *pre-school children (0 to 6 years);*
  - *girls toys;*
  - *boys toys.*

So what are the company's typical products?

- *The highest volume products are:*
  - *plastic toys*
  - *dolls*
  - *vehicles + action figures + games*

Does the client manufacture these toys themselves and if so where are the production facilities?

- *The client has its manufacturing done in Asia.*

Is the business profitable?

- *The client's profit margin is about 10-15%.*

I could already propose some possibilities the client could look into. The first one that comes to mind is that the client is not strong in the electronic game business, which has been the fastest growing segment over the last decade in the toy industry. The client should consider one of three options: either grow their electronics business themselves, or buy a company that already is specialized in electronic games, or else form a partnership with such a firm.

We would also need to investigate distribution issues in order to assess why sales are flat. How is their distribution strategy?

- *They have subsidiaries in the main European markets, responsible for sales in these markets. The sales force visits the distributors of the toys, which are mainly supermarkets and department stores on the one hand and toy shops on the other hand. The client has a good brand image in its markets. There is no problem in this respect.*

Let's look into the issue of the customers then.

- [At this point my friendly consultant thought it to be the ideal moment to present me with the following (hypothetical) situation:] *"Suppose you are in a meeting with this client and the question arises as to how large the toy market really is in Belgium? What would you say on the spot?"*

[Here my case turned into an estimation case.].

Let's say that we consider mainly (for this client) the market of 0-14 year old children. There are 10 million people in Belgium, which translates into about 3 million households if you take an average of 3 people per household. Not all households have children, and some have more than one, and so I guessed that there would be about 0.5 child on average in this age category per household, so 1.5 million children.

Then I looked at the gifts they receive and started to enumerate important occasions children at that age get presents from their parents: birthday, Christmas, beginning and end of school, and maybe one more occasion, which gives 5 in total. Then I said that each time the parents would spend 1,500 Belgian Franc (= 50$) on average. So this means that each child receives toys for an amount of about 7,500 BFR per year.

I then multiplied the 7,500 BFR with the 1.5 million children to find my estimate for the toy market in Belgium of about 11 billion BFR. This was within 10% of the real figure.

Our client is the association of New England ski resorts. It is 1985, and profitability of member resorts has been going down for two years. The association has hired us (1) to find out why and (2) to recommend what to do about it.

I would like to begin with the profitability equation to try to determine where the problem is, then drill down to look for its causes and figure out what to do about it. Let's begin with the revenue side. Has the average price of lift tickets gone down?

- *No.*

Has the number of skiers gone down?

- *Yes. It's plummeted over the last two years.*

Well that seems to be the problem, then, but before I go into the details I just want to check the cost side to make sure that nothing has changed there. Have fixed or variable costs gone up over the last two years?

- *No.*

Let's go back to the declining number of skiers. I think the first thing is to figure out why the number of skiers is going down, then make some suggestions about what to do about it. There could be demand-side or supply-side reasons why the number of skiers at New England resorts is going down. On the demand side, people could be skiing elsewhere; or they could be doing other kinds of recreation instead, like going to the Caribbean; or they could be cutting back on recreational activities. On the supply side, some external factor like two years of warm weather could be causing fewer people to ski.

- *The weather has been fine, so how would you determine why the number of skiers was going down?*

We could look at trends in ticket sales at ski resorts outside New England: if sales are going up elsewhere, then perhaps people who were going skiing in New England are now going to the Rockies or Europe; if sales are going down elsewhere, then it may signal that skiing is becoming less popular nationwide. Resorts themselves would probably not share this information with us, but there may be other organizations like our client that aggregate such information. To check any inferences that we made from these data, we would want to talk with people and ask them why they were no longer skiing in New England.

- *How would you find people who used to ski in New England but no longer do?*

Probably the easiest way is to rent mailing lists from ski magazines, focusing on subscribers who live in New England or New York, and do a telephone or mail survey. In the survey, I would ask people how often they ski in New England, how often they ski elsewhere, how often they do other recreational activities like go to the beach, and whether they had changed those habits over the last two years.

- *Good. Say you find out that skiing is as popular as ever, but that more people are now going out west instead of skiing in New England. What do you think could cause a shift like that?*

The four main costs of going on a ski vacation are equipment, transportation, lodging, and lift tickets. I would say that equipment, lodging, and lift tickets are more or less the same in the Rockies and in New England. But someone living in New York or New England will have to fly out west, which is a lot more expensive than driving up to Vermont. That suggests two possibilities: either a raging economy is making people feel wealthier, so they're willing to pay more and fly out west, or (more likely) airlines have cut their fares, meaning that people would be paying a smaller premium to go out west.

- *That's exactly what happened. What would you do about it?*

I would want to look at ways to drive the number of skiers or the revenue per skier back up, or drive costs down. We might be able to drive the number of skiers back up by reducing prices, offering regional passes, or offering additional services like a more comprehensive resort experience. Or we might be able to drive the revenue per skier up by increasing prices or adding on lodging, equipment sales, etc.

- *How important do you think the skiers will be to improving profitability at these resorts?*

I think they'll be very important, unless we can drive costs down substantially.

- *What do you think the cost structure of a ski mountain is like?*

I would guess that it is almost all fixed costs: the mountain, lifts, ski patrol, snowmaking, etc.—you have to have to pay for all that whether you have 20,000 or 2,000 skiers in a day. So variable costs will be a very small portion of the total.

- *True. Can you think of any other ways to recover those fixed costs?*

Uh…

- *Right now you're only spreading your fixed costs over three or four months of the year, when people are skiing. What about the rest of the year?*

Aha! This must have been when ski resorts started building golf courses, water slides, and so forth, so that they could get some revenue during the summer months as well.

- *Exactly.*

Business Type Cases (abbreviated answers)

A large food conglomerate (such as a Nabisco or Kraft) has a small plant in Maine that produces apple juice from one specific type of apple which is grown locally. The apple juice is premium priced and positioned. The company bought the plant from a local farmer cooperative a few years back with the hopes that the company could increase the plant's capacity through better management. The plant is currently operating at full capacity. There was an accident at the plant recently where a worker broke his leg. This incident prompted a review by OSHA (the govt. review agency in charge of occupational safety). OSHA has informed the company that an additional $2 million investment is needed to bring the plant up to current safety standards. You have been hired by the company to help it decide what it should do. Specifically, you need to provide your client with a list of options and then identify the one that you recommend.

Additional information provided (if interviewee asks probing questions):

- *The apple juice product is breaking even for the company.*
- *There are several other premium apple juice brands. The competition is stiff.*
- *There is a raw material constraint (there is a limited number of this specific kind of apple which is grown each year).*
- *The demand for the apple juice is strong. Consumer demand is only limited by the availability of supply. The strength of the demand stems from the uniqueness of the product (that special kind of apple).*
- *Producing a concentrate for the juice will not work for this plant (too costly to convert machinery and this specific kind of apple does not lend well to such a use). In other words, you cannot grow more apples or stretch more out of the current supply.*
- *The company's competitive advantage is its marketing expertise and distribution system.*

One Approach:

After asking several questions to get more information, I outlined the following options: 1) get out/ sell, 2) status quo approach (invest minimum necessary to meet govt. standards/do nothing), 3) gung-ho approach (invest above minimum level in both the facility and the human resources). It is important to list all possible options in an effort to be thorough, rather than to just identify one or two of the more viable alternatives. Then, I identified the stakeholders in this decision (the farmers, customers, company, local community, U.S. govt. regulators, and competitors) and discussed the advantages and disadvantages of each option for each of the stakeholders. In this question, the company is also asking itself, 'what is my internal rate of return?' (or are my funds put to a better use elsewhere in the organization). With this question in mind (and the fact that there is a resource constraint and the product is just breaking even), the company should get out/sell the plant. However, this option also has public relations implications (layoffs, bad PR because of the accident, news could leak that the company didn't have the best safety standards, etc.). The best option is to sell the plant to the farm cooperative or work out some joint-partnership agreement with them.

The Official Approach:

There are three main options:

1) walk away (shut down the plant or sell it)
2) invest more money into the plant
3) arrange a partnership agreement with the local farmer's cooperative who originally sold the plant to your client which would place the plant operations in the hands of the farmers while the company would market and distribute the apple juice. This is the approach that should be recommended to the client.

Additional note from the student:
This case is very unique. It serves a good purpose – which is to get the student to answer the question that is directly being asked ("what are my options, etc.?") and, to use the biggest consulting cliché of all, to "think out of the box," rather than fall into a safe case framework. The successful individual will probe for more relevant information and assess the situation by developing his or her own framework that is unique to the question at hand. The traditional frameworks serve as a good starting point, but don't be locked into them.

You are the manager of a food concessions operation at a stadium. You have 100 employees who can each sell ONLY ONE of the two products you offer: Coke or Sprite. Having done careful market-demand studies, you know with a VERY high degree of certainty that the salespeople you assign will create daily revenues according to the following schedule: The first person you assign to sell Coke will produce revenues of $100, the second $99, the third $98, and so forth. The first person you assign to sell Sprite will produce revenues of $90, the second $88, the third $86, and so forth. How many people do you allocate to sell each soft drink to maximize expected daily revenues?

One Approach:

This case tests your ability on your feet to think analytically using mathematical patterns. I think the best way to approach this case is to make a simple two column table on a piece of paper and list the expected returns for each soft drink:

Coke	Sprite	
100	90	
99	88	
98	86	
97	84	
96	82	etc…

Then, simply start asking yourself, 'Who will produce the most revenues?' Each time you ask yourself this, put a number (representing the # of the salesperson-- 1-100) next to the figure in the table that it represents. For example, the first time I ask the question, I would put a '1' to the left of the '100' figure in the Coke column; the second time, I would put a '2' to the left of the '99' figure in the Coke column.

First the easy part: The first 10 salespeople would be assigned to Coke since all of them would produce more revenues than any of the Sprite. Now it gets interesting. The 11th salesperson would be assigned to Sprite (producing $90); the 12th and 13th would be assigned to Coke (producing $89 and $88, respectively); the 14th would be assigned to Sprite (producing $88); the 15th and 16th to Coke, etc.

See the pattern? Every third of the remaining 90 salespeople would be assigned to Sprite, and the rest to Coke. 90/3 = 30. So, 30 people would be assigned to sell Sprite and the rest (70) would sell Coke (100 - 30 = 70). The trick with this kind of case is to recognize a pattern and apply an appropriate formula (i.e. knowing every third person is assigned to Sprite and dividing that by the remaining salespeople). If this kind of thing comes easy to you and you can do it in your head, good for you. If you can't, don't panic! Use pen and paper and realize it visually. I was given about 10 minutes to solve the problem, which is actually plenty of time to spin out the problem on paper enough to see the pattern.

We were asked by a diversified manufacturing client to help turn around the steam boiler hose division. This boiler hose division provides boiler hoses for both external customers and the client's boiler division. How would you structure an analysis at restoring profitability? Where do you expect to save costs?

Background information on the client and industry includes:
- Boiler hoses are sold both with original equipment and as replacements.
- There has been increasing price pressure in the industry.
- The client is third of eight industry participants.

Additional information provided (if interviewee asks probing questions):

- *Last year P & L showed (as percent of sales):*

Raw Material	*70%*
Labor	*20%*
Distributed Overhead	*10%*
SG&A	*15%*
Profit	*(15%)*

- *Raw material is a commodity petrochemical.*
- *At least two of the other companies in the industry are making moderate profits.*

Baseline Approach: (avoid getting bogged down in the following areas)
- Drop the product line (not possible because hoses are necessary for boiler sales)
- Raw material prices (they are the same for all competitors)
- Allocation of overhead (no savings and provides little potential)
- SG&A (standard industry fee paid for independent installers)

Better Approaches: (move beyond the previous answers & incorporate the following)
- Scale economies (client is big enough to achieve scale production)
- Production technology (client has a modern plant)
- Labor costs (wage rate and productivity are average for the industry)
- Raw material purchasing practices (materials are purchased through long term contracts based on spot market minus a discount).

The Best Approach: (these, following a logical progression, stumble upon the answer)
The product has been over-designed, requiring excess raw material. The answer should consider the following organizational implications:

- How is our product engineering operation wired into the marketplace? (There is little contact between the engineering and marketing/sales organizations).
- What kind of feedback are we receiving from our sales force? (Customers are delighted with our hoses, but don't require all of the product features).
- Are there other areas in the company where similar problems exist?

Two companies are the only competitors in an industry and produce exactly the same product. Your client was the pioneer in the industry and has controlled 70% of the market for many years. Their competitor has always followed price changes initiated by your client. Recently though, the competitor has aggressively lowered prices 15% and has cut into your client's market share reducing it to 60%. Your client's profit margins are only 14%, so they are hesitant to match the price cut, but they are afraid that they will continue to lose share if they don't.

Assume that there is no threat of new competitors entering the market and that there are no substitute products. All inputs are commodities and are readily available. The end-users are sophisticated and make their purchasing decisions based mostly on price. How has the competitor managed to cut prices so dramatically and still make money and what would you advise your client to do?

Additional information provided (if interviewee asks probing questions):

- *Industry growth has historically been 5% per year, but has flattened out completely in the last year.*
- *There are many buyers and the price of this product is a negligible input cost for them.*
- *Your client and its competitor both are financially strong divisions of larger unrelated companies.*
- *Raw materials make up 50% of the total cost of producing this product. All other costs are fixed.*
- *Both competitors use essentially the same process and have very similar cost structures.*
- *Capacity can only be modified in large increments and the competitor brought on a new line 6 months ago.*

One Approach:

This case is all about capacity utilization with some game theory and defies most frameworks. Trying to apply Porter's five forces or an equivalent model will lead to series of "no, that's not an issue" comments. Don't get caught up trying to figure out what the product is - it doesn't matter! It cannot be differentiated.

Market size is constant and market share for your client fell from 70% to 60%, so output fell by about 14%. Since 50% of the total cost is variable, 50% must be fixed. A 14% drop in volume would therefore equate to a (14% x 50%) = 7% increase in average unit cost for your client (fixed unit costs increase!). Although specific cost data for the competitor is unknown, the increase in volume they have experienced has reduced their unit cost in much the same way. When the competitor increased market share from 30% to 40%, his volume increased by 33%. If we assume that the competitor has a similar

variable cost component of 50%, then their average unit costs would have gone down by approximately (33% x 50%) =16.5% as they spread their fixed costs over a larger volume.

The competitor had an overcapacity problem and figured that they could make more money with higher volume by cutting prices. The 16.5% cost reduction offset the 15% price cut they incurred and their volume increased 33% so they came out way ahead. The rest of the solution is in game theory. Advise your client to match the competitor's price and follow their price changes to show them that they cannot undercut your price. Aggressively try to regain customers who were recently lost by offering extra inducements to try to get back lost market share. Since your client is larger, they have a slight cost advantage and can fare better in a price war. Once the competitor is made to understand this, advise your client to incrementally raise prices and make sure the competitor follows. Since there are many buyers and the product cost is only a small contributor to their overall costs, it is unlikely that they will respond negatively to the price increases.

My current phone bill is about $100 a month, what do you expect it to be in five years?

Additional information provided (if interviewee asks probing questions):

- *The subject is not currently married, nor does he have children.*
- *The subject is likely to be married in five years.*
- *The subject does not currently have a home office.*

One Approach:

There are two parts of the calculation, the usage and the rates. Thus, usage will likely double. In addition, there is a possibility that the subject will have a home office in five years.

The phone bill is made up of a flat rate for local charges (given as $30), plus variable long-distance charges of $70. Given competition in phone service both are likely to go down, with long distance going down more because it has more competitive pressures and is less influenced by high tax rates. Do the estimates and come up with a number. Do separate estimates for the home-office possibility and either use the probability of having a home office to estimate an expected total phone bill or give two separate answers depending on the scenarios.

The consultant gave a follow-up question: what is the confidence level for the estimate? You can say conservatively that phone rates are certainly not heading UP over the next five years so the conservative estimate would use current pricing. Also the home office scenario really influences usage.

A wealthy gentleman has recently discovered that a piece of land he is holding is extremely valuable. He wants to know what he should do with it.

Additional information provided (if interviewee asks probing questions):

- *The man does not want to be actively involved in any business opportunity.*
- *The land is adjacent to a new booming suburb, further from the urban area.*
- *There are no roads directly from the city to this piece of land and only local roads to the suburb.*
- *The land is currently vacant.*

One Approach:

The first step was to clarify objectives. I was given little information so I tried to understand the client's perspective. It was through my questioning of how much effort he wanted to put into running a potential business that I learned the client wanted a hands-off solution.

I then wanted to learn more about the land itself. I asked him to draw me a map, to describe the type of land it was (swamp, farm, etc.), and if there had been any inquiries from potential purchasers. I learned of the property assessment he had done and that the land was suitable for construction.

I directed the conversation to other issues that made the land desirable or not - political, regulatory, accessibility, etc.

Given the recent rise in the land's value, I learned that there has been an exodus from the city to the suburb. The man has the following alternatives: He can sell the land, develop the land and rent or sell it, or he can wait and see what happens. Use a profitability analysis to learn the costs and price that would give the greatest present value. Issues to consider include the regulatory impact of building (i.e. zoning laws), the accessibility of the property, and the population growth of the area (are people still moving out of the city, are they migrating from elsewhere, etc.).

We did not get much further and he asked for a recommendation. I said to develop the land and rent the properties. I received no feedback.

American Express has faced strong competition from new credit cards entering the market. They are considering dropping the $50 annual fee. What are the "economics" of such a decision and should they drop the fee or not?

Additional Information (Assumed)

- *$50 annual fee multiplied by the number of members.*
- *To overcome this loss, they have to increase the revenues from consumer purchases (1% from the retailer).*
- *Is it likely that current cardholders will spend more per year if the annual fee is dropped No. They'd still have to pay off their balance every month.*
- *Therefore, the only way to increase revenues from consumer purchases is to increase the number of AMEX holders.*

One Approach:

- Structure Solution
  - Determine how American Express makes money.
  - Evaluate the pro's and con's of dropping the annual fee.
  - Make a recommendation.
- Make Estimations/ Assumptions
  - Number of current cardholders = 4% of the U.S. population (just a guess).
  - - 250MM x 4% = 10MM current cardholders
  - $50 x 10MM = $500MM annual loss by dropping the fee.
  - Current percentage revenue: 10MM members x $1,000 annual purchase (avg.)
  - [10MM x (1,000 x 1%)] = $100MM (Estimate of current percentage revenue)
- Answer the following key questions
  - Can we attract enough new members (without a fee) to offset a $500MM loss?
  - Each new member contributes $10 (1% of $1,000 annual purchase).
  - (500MM / $10) = 50MM new members are needed.
  - 50MM new members is equivalent to 20% of the population (gut check)

Assessment / Recommendation

- Based on these assumptions, increased membership equivalent to 20% of the population is probably not likely. Don't drop the fee.
- May want to consider varying the fee (sensitivity vs. new members).

A large Healthcare company has decided it is interested in substantially increasing the scale of its operations. Its goal is to double total sales and profits in less than two years. As a consultant brought in to assist them, what would you do?

Additional Information (Needed):

- *What are the specific objective (quantifiable) advantages to pursuing and achieving this goal?*
- *What is the current scope of operations?*
- *In what areas of healthcare does the company do business? What is the current market share in these areas?*
- *What plans has the company already considered / is already considering?*
- *What is the competitive nature of the industry?*
- *What would be the effect on sales and profits of reducing prices/margins?*
- *What potential is there for expansion by acquisition? Do they have the financial capability? Do potential targets exist? Can they get financing?*
- *What will be the reaction of the competitors to this expansion?*
- *What is their financial condition?*
- *What will be the reaction of the customers?*
- *What are the relevant current and anticipated government regulations?*

One Approach:

A business can increase its profits (ROI) by increasing sales, increasing prices, or cutting costs. If the company's margins are consistent with the industry norms, it is unlikely that increasing prices or cutting costs are likely to provide a means to double sales and profits, particularly if the company operates in a moderately competitive environment.

The situation leaves only sales increases. Sales increases are achieved by:

- Selling more of the current products to current customers
- Selling new products to the current customers
- Selling current products to new customers
- Selling new products to new customers

The suitability of each of these options depends on the particular environment. In the particular example of this case, it turned out that the company could achieve its goals only by selling new products to new customers via some form of diversification.

Next, you should consider the potential for increasing sales by means of diversification through acquisition or joint venture. The relative benefits of each will depend on financial resources as well as the existence of suitable targets or partners.

Your client runs a national chain of mall-based stores that specialize in athletic shoes (sneakers, cleats, etc.) and also carries sporting apparel (hats, t-shirts, etc.). There are two other mall-based athletic shoe retailers who are very similar to your client in terms of size, product mix and strategy. Your client informs you that profits are declining and wants you to determine why and recommend a strategy to deal with it.

Additional information provided (if interviewee asks probing questions):

- *Sales are down at all three mall-based retailers, but sneaker industry sales are up overall*
- *Costs have increased, but all increases have been passed along to consumers to maintain margins.*
- *Non-traditional competitors have emerged who offer lower prices but no service.*
- *Customers fit into two segments, "users" and "fashionites." "Users" represent 40% of sales and seek out durable products and knowledgeable salespeople. "Fashionites" comprise the remaining 60% and want to look good in the hottest new sneakers, but are more price conscious than the "users."*

One Approach:

Profits have decreased, so we use the profit equation, Profit = (Price-Costs) * Quantity. A simple 3 C's analysis will also help bring out the key issues - What are the **c**ompany's core strengths? Who is the real **c**ompetition and what are they doing differently? What **c**ustomer segments do we compete for and what are their unique needs?

Costs have gone up, but so has price, so margins are relatively unchanged. Profits have decreased, so quantity must have decreased also. Sneaker sales are up overall, but have decreased in the malls so the other distribution channels must be stealing share. The other distribution channels must be identified and analyzed in terms of their value propositions (price, selection and service). It turns out that discount stores offer lower prices, but little variety and no service. Mall stores offer good service but charge higher prices to cover their higher costs. The "users" depend on variety and quality service and have remained loyal to the mall-based stores. Discounters do stock the hottest shoes at lower prices, so they must be stealing market share among the more price conscious "fashionites" who don't care about service.

Since the mall-based retailer depends on both segments to survive, it cannot cut back on service for the users. It can, however, manage its inventory more effectively to offer discounts on the fastest moving "hot" shoes. Since the "fashionites" are likely to be in the malls for other needs, they should be able to draw them back into the stores. Losses due to the discounts on these shoes can be offset by increased volume, rapid turnover and complementary sales on t-shirts and accessories once these customers are in the store. The prices do not need to match the discounters since the mall-based store benefits inherently from mall based traffic and can charge a slight premium for the convenience of location.

Major discount retailer with over 1300 pharmacies. Pharmacy operations have flat sales in growing industry. Profitability is very poor relative to industry. Chain has history of decentralized pricing and promotion for pharmaceuticals, leading to strong autonomy in field operations, as well as wildly inconsistent pricing. Customer pricing complaints and customer attrition is chronic. New head of pharmacy operations has engaged us to "solve" the pricing issue. How should we proceed?

One Approach:

Utilization of 3-C framework:

- *Who are the customers? How do they select a pharmacy? How important is price?* Customers are generally older, repeat, discount-sensitive shoppers (as opposed to convenience oriented shoppers). Customers may initially select a pharmacy on referral, location, or price and tend to build strong loyalty to pharmacy sue to personal relation with pharmacist and high switching costs (transfer of records, etc.…). Price tends to be a major factor. Particularly given nature of customer (usually pay in cash from fixed income) and trust relationship (Price fluctuations tend to be very bad). Inconsistent pricing on a give item may lead to price shipping, exposing all purchases to scrutiny and losing a customer.
- *How do we Price?* We generally recommend a standard mark-up from cost, with price matching to be determined by the pharmacist at the store. As mentioned before, this leads to wildly different pricing from store to store, as different pharmacists are vigilant to different degrees regarding optimal pricing strategies.
- *Who are competitors? How do competitors price?* Competitors come in three distinct groups: chain drug stores (Walgreen's, Duane Reed, etc.), independent pharmacies, and discount chains with pharmacy operations (Wal-Mart, Kmart). Client is in the "discount" group, but competition is fierce between groups.

Next step, Pricing study: Select a market basket of items in commonly dispensed quantities and call for prices from a selection of competitors' and our stores across the country. (Study finds that prices on high volume items are very erratic, from our prices at the higher end to well below cost at some discounters. Less common items display more consistent pricing across chains, with our prices more or less in line. The items with the most aggressive pricing are maintenance items that are taken for the rest of a patient's life like heart, diabetes, and cholesterol. They represent an unavoidable expense and customers are very sensitive to pricing on these items).

Solution: Test a pricing program where prices are set centrally for a number of stores in different markets. In this test, set prices very aggressively for items identified as key items, and try to make up margins on non-key items. Monitor results, adapt and roll out if volume and profits warrant.

The CEO of a large, diversified entertainment corporation has asked our team to examine the operations of a subsidiary of his corporation that manufactures video games. Specifically, he needs to know if he should approve a $200 million capital request for tripling the division's capacity. You are a member of the team assigned to this project. Assume you and I are at the first team meeting. What are the critical issues we should plan to examine to determine if the industry is an attractive one for the CEO to continue to invest and why?
[This case comes from an actual interviewer's guide]

Additional information provided (if interviewee asks probing questions):

- The division is the third largest manufacturer of hardware in the industry with ten percent market share. The top two producers have 40 and 35 percent market share. The remainder of the market is shared by small producers. The division sells to a broad range of consumers.
- The division's sales have increased rapidly over last year from a relatively small base. The current estimate is annual sales of 500,000 units. The current estimate of industry hardware sales is 5 million units annually. Industry growth has been strong over the last few months, although sales growth has slowed.
- The current sales price for the basic unit is $45. The division remains less than 20 percent of the parent company sales. The two top competitors develop, manufacture, and sell both hardware and -software. While our client makes and sells its own hardware, it only sells licensed software. The industry growth of software continues to increase.
- The division estimates that the current fully loaded cost is $30 per unit. Requested expansion should reduce the cost by 5 to 7 percent and triple production of the hardware units. The two top competitors are estimated to have a 10 to 15 percent cost advantage currently. The main costs are assembly, parts and labor.
- The division estimates much of initial target market (young families) has now purchased the video game hardware. No large new user segments have been identified
- Primary outlets of distribution are toy and electronics stores.
- The division currently exceeds corporate return requirements, however, margins have recently been falling.
- The hardware standards have been established by the industry leaders. The product features are constantly developed (e.g. new type of remote joystick) to appeal to segments of the market.

Baseline Approach: (the following must be addressed)

- *What is the future market potential?* The candidate needs to question the continuation of the growth of the industry overall. S/he might ask about the saturation of markets, competitive products (e.g. home computers), and declining "per capita" usage.
- *What is the competitive outlook?* The candidate should at least recognize the need to examine competitive dynamics. Issue areas might include concentration of market shams, control of retail channels, and the R&D capabilities (rate of new product introductions, etc.)
- *What will the price/volume relationships in the future? Issues of prices might need to be considered.*

Better Approach: (move beyond the previous answers & incorporate the following)

Market Potential

- Recognize that there is a relationship between market penetration and growth in new users which, when combined, yields an industry volume estimate.
- Address the shifting mix of product purchases, in this case from hardware (player unit) to software (video cassettes).
- Investigate buyer behavior in key segments, i.e., “fad” potential of product.

Software

- Recognize that the technology standards are set by the industry leaders. In this situation, the division, as a secondary player, will have to follow these standards. Recognize that different distribution needs may exist for different products (in this case hardware versus software).

Price/Volume Relationships

- Discuss the effect capacity additions can have on overall industry price/volume relationships and on industry price levels.

The Company’s Ability to Compete

- The candidate should ask what the expansion is designed to do.
- The candidate should explore the cost position of the client division relative to that of the other competitors.
- The candidate should seek to understand the reasons for poor profit performance of the division.

You work at a large company, which has many divisions. Each division uses different brands of computers and software packages. As the new head of procurement at corporate headquarters, how would you go about convincing the divisions to adopt a common standard if you do not have the power or authority to force the change? What advantages would there be if there were a unified standard?

One Approach:

The obvious answer is that there would be cost savings from buying computers in bulk. Imagine each division needs 25 computers and each picks up the phone and calls around. Not much buying power. If you were instead representing the entire company and called around for quotes on 1,000 computers, you could probably get a much better price. This is a simple marketing concept: power of the buyer. This would also extend to software licenses, etc.

However, the better answer would then examine more closely the true cost of computer usage. While there would indeed be savings from buying in larger numbers, the majority of cost associated with a computer appears after you open the box. Just think back when you bought your computer for Columbia - in addition to the actual computer you had to buy software, cables, PC-cards, etc. And imagine if you had to pay $$$ each time you visited the computer desk. And don't forget all the training costs associated with teaching people how to use their computers, etc.

In a large corporation, the major cost associated with computers is probably from tech support. A $5k laptop is nothing compared to the annual salary of a tech support guy. In this hypothetical company, apparently each division has its own help desk. Corporate could consolidate these help desks and save money that way. If you remember queuing theory from Operations, you could argue you would need fewer tech support people since each could now help any employee.

So if the division agreed to follow a unified standard they would receive substantial benefits. They would spend less on the hardware and software because of increased buying power. They would also save money from not having to support their own help desks. In addition to cost savings, they would probably also receive quicker and better computer support.

EXTRA: What my interviewer seemed to really like is that I used as a framework the computer situation at my previous employer. I worked at a large firm and my division had its own computer policy. The other divisions in the company used Compaqs and Win95. However, my division wanted to use IBM Thinkpads. The compromise was that we would use Compaqs and OS/2. The rumor was that the golfing buddy of our division president was high up in IBM. We had our own help desk, which had to develop special applications that would work in OS/2, etc. The line was always busy between 9 am and 1 PM since that was when we needed to place in trades (and therefore use our computers). And after 1 PM the help desk usually just sat around. For a framework I just used the above points in reference to what was going on at my old firm.

Hammerjack is a regional chain of "local hardware stores" located in numerous neighborhood strip malls and shopping centers. They had enjoyed excellent performance for the past 15 years but have experienced declining profits in the past two years. They are concerned about their profitability and have hired you to explain their situation and provide recommendations to get them back on track.

Additional information provided (if interviewee asks probing questions):

- *CGS – no change*
- *Overall sales – down*
- *Lease of space – no change*
- *Number of customers – down slightly*
- *SG&A, Overhead – no change*
- *Dollar amount of purchases – down heavily*
- *Franchise costs – no change*
- *All other drivers – no change*

One Approach:

- Start by analyzing drivers of profitability: Profit = Revenue – Costs and reviewing competitive issues
- Make the following assumptions:
    - Losing customers and based on the heavy decrease in dollar amount purchased, we are losing high spending customers. (There must be substantially different customer segments)
    - Losing customers and dollar revenue because Home Depot and other huge "warehouse" hardware stores have entered Hammerjack regional locations.
        - Lower prices due to buying power (economies of scale).
        - Provide additional services such as training courses, information, tips.
        - Stealing contractors due to substantially lower costs and stealing DIYs due to price and help.

- Derive the following 3 target segments (as follows):

	Maintenance People	Do It Yourselfers	Contractors
# of visits	*1*	*10*	*100*
$$ spent/visit	*$100*	*$1,000*	*$10,000*
# of people/segment	*100M*	*10M*	*10,000*

- Based on this information, you determine which segments are most valuable to Hammerjack.

	Maintenance People	Do It Yourselfers	Contractors
Total Segment Worth	10 Billion	100 Billion	10 Billion

- You determine that the "Do It Yourselfers" (DIYs) are the most important category.

Maintenance segment is still loyal because they only shop once a year and for a lower dollar amount. We probably can't keep the contractor due to price. How do we keep the DIYs?

Potential Solutions:

- Offer the training courses with an emphasis on the local knowledge of the neighborhood.
- Anticipate the products needed by DIYs and offer competitive prices on those items.
- Acquire or align with other local chains to gain buying power.

Estimation Cases

Suppose you are flying on a plane with the CEO from Exxon and you want to sell a consulting engagement. He has just left to use the lavatory and you have about five minutes to estimate his yearly revenues from personal automobile gasoline sales in the U.S. (excluding commercial trucks, boats, etc.) How would you go about coming up with this estimate?

1. Assume the population of the U.S. is 250 million.
2. Estimated number of people per household is 2.5, making 100 million households.
3. Estimated number of cars per household is 1, which gives 100 million cars in the U.S.
4. Assume each car gets filled up once per week (or 50 times per year to use simple numbers)
5. Assume the average fill-up is 10 gallons. 50 X 10 is 500 gallons per car.
6. Total gallons sold is 500 X 100 million = 50 billion.
7. If average price is $1.25, total revenue from U.S. automobiles is $62.5 billion.
8. Estimated market share of Exxon is 20% [the interviewer asked me why and I explained that I believed the market was basically an oligopoly with a few players dominating the market. This type of market typically has market share of the dominating competitors of around 20%].
9. Calculated total revenues for Exxon from the U.S. household automobile market, therefore, is $12.5 billion.

How many beer bottles are currently in circulation in the US?

First I decided to figure out the annual beer consumption to get at annual consumption of bottles. I estimated the population of U.S. as 250M, took out children who don't consume beer (approximately 10%, which gave me the number of 225M). Then I divided it into men and women as they have different consumption patterns – men probably consume more. I estimated the number of men and women to be approximately equal at 125M and 125M. Then I estimated that men probably drink 2 bottles a week on average, making it approximately 100 bottles a year per person (heavy beer drinkers and men not drinking beer will average out), giving a total of 12.5B. Women probably drink 2 bottles a month making it a total of 3B yearly. The total yearly consumption is 15.5B.

This is where the trick was because my interviewer was not satisfied with a yearly number, he wanted to have a current circulation number. I used the concept of velocity to come up with the number: yearly consumption = current circulation * some velocity (# times the bottle goes through the economy). I estimated the velocity to be around 70 assuming an average 5-day purchasing cycle. Thus the current circulation of beer bottles equals approximately 220M bottles.

I have an odd hobby (odd because this interviewer was male) of knitting. I knit about 10 sweaters per year. I am looking into this as a business opportunity and want you to estimate the size of the hand knitting yarn market.

First I would look at all the places that sell hand-knitted sweaters and …

- *Actually, most of the hand knit sweaters sold in stores are produced abroad and the yarn they use is produced abroad. I am more concerned with the high quality hand knitting yarn sold in the U.S. for "hobby" type knitting.*

OK, then I would try to estimate how many people knit or I could look at how many stores sell knitting yarn.

- *Good, there are 3,000 specialty stores that sell knitting yarn. Also some bigger stores, like Wal-Mart, sell a small selection of lower quality yarn.*

OK, then I would take a sample of these stores and estimate their sales of yarn and then extrapolate that over the remaining stores. I would try to sample stores that are of typical size and revenues.

- *OK, I have data on 3 stores. The first is in Rhode Island and has $100,000 in annual revenues. The second store is in Austin Texas in the owner's garage. Its revenues are $40,000. The third store is in Massachusetts and has revenues of $170,000.*

I don't know if these three are typical and is not a large enough sample to base the system on. Hmmmmm . . . . . I guess if each store stays in business it must be making money. Maybe I can look at what it would take for each store to stay in business.

- *Good, what expenses would a store like this have?*

Rent, Labor, Advertising, and the cost of the products.

- *The mark-up on knitting supplies is about 100%, although with sale items it averages around 60%. Of the expenses, the variable costs make up about 50% of expenses. What would be your estimates for an average size store's expenses?*

Since these knitting shops are probably not in malls, and one was even in a garage, I would say the rent is fairly low, say $500 per month. There are probably just a few workers that aren't too well paid. Maybe they are making $30,000 a year.

- *Do you know what minimum wage is?*

OK, so maybe they make $15,000 a year. Advertising would consist of just local ads in papers and maybe a knitting magazine. I would guess that to be about $2,000 a year. The sum of these

costs is $38,000 per year. If this is 50% of expenses, then the total costs would be $76,000. So with their 60% markup it would be….

- *For simplicity just base your initial estimates on break-even.*

OK, then 3,000 stores that sell $76,000 annually, it comes to $228 million. Wow that is bigger than I thought it would be.

- *Actually the knitting yarn market is about $350 million. Do you know why your numbers are understated?*

Well, actually I would say that my number is somewhat overstated because there are other supplies, such as knitting needles, patterns, etc that would be part of the sales. But I also realize it is understated because we assumed break-even and I am sure most of these stores turn a profit or they would not stay in business. Also, we only counted the sales at the specialty stores. I ignored the sales at the Wal-Mart type stores.

- *Good.*

How many people fly in and out of LaGuardia every day?

My first attempt at this was to begin with the number of airlines that fly into/ out of LGA. I then proceeded to try to figure out how many cities these airlines fly to from LGA. This was nearly impossible to determine realistically. I asked to try again and the interviewer said "good idea."

I looked at the problem again and realized it was a capacity problem. No two planes could be on a runway at a given time and most likely had to be spaced by a few minutes for safety reasons. With this assumption, I continued to break the day into peak (7am-10am, 3pm-8pm), midpeak (10am-3pm) and off peak times (8pm-11pm). I assumed no flights in the middle of the night. I further assumed planes are spaced 5 minutes apart at peak hours, 10 minutes at midpeak and 15 minutes apart during off peak times.

Capacity assumptions assumed 100% at peak, 75% at mid peak, and 50% at off peak. With an average plane holding 200 people, it would be (200 people/plane x 12 planes/hr x 8hrs) + (150 x 6 x 5) + (100 x 4 x 3) = 24,900 people.

With 2 runways, LaGuardia has roughly 50,000 people flying in and out every day.

The feedback I got was good (moved onto the next round of interviews). The interviewer told me he was looking for me to break the problem into peak and off peak times. To be even better you could give an answer for weekdays and weekends (peak times shift).

How many gallons of ice cream are sold in the U.S. each year?

Ice cream can be sold through retailers and restaurants. First, let's analyze the retail sales. Assume that of 250 million people in the US, 80% like to eat ice cream. That makes 200 million possible consumers. Ice cream sales are likely to be somewhat seasonal especially in northern states, so assume an average selling season of eight months in the North and ten months in the South, for an average of nine months for the whole country. During the season, assume that people eat ice cream twice a month, and assume that the average serving is one pint. Since there are eight pints in a gallon, retail sales will be: 200 million people x 9 months x 2 servings per month x 1 pint / 8 pints per gallon = 450 million gallons.

Assume that 80% of the U.S. population frequents restaurants, and that they do so at a rate of twice per month on average. That makes 250 million people x 80% x 12 months per year x 2 visits per month = 4,800 million restaurant visits per month. Assume that 50% of these restaurants offer ice cream. That makes 4,800 million x 50% = 2,400 million possible purchases. Now assume that one out of ten times, the customer will order ice cream. That adds up to 2,400 million x 10% = 240 million purchases. Now assume that the average serving is half a pint. Since there are 16 half pints in a gallon, the total restaurant purchases come out to be 240 million purchases / 16 servings per gallon = 15 million gallons.

Total purchases of ice cream are 465 million gallons per year. Do a quick sanity check by dividing this number by 250 million people, which means that the average annual frozen yogurt consumption is 465/250 or a little less than 2 gallons per head of the population – that seems to be reasonable.

Are there two dogs in the world with the same number of hairs?

After a one-minute silence, the interviewer suggested that I divide the problem in 2 parts:

1. How many different possibilities are there for the number of hairs in a dog?
2. How many dogs are there in the world?

To find out the number of different possibilities of hair in a dog, I started by figuring out the hair-covered area of the smallest dog in the world and the largest dog in the world.

Approximate the body of a dog using geometrical figures: 1 cylinder for the body, four cylinders for the leg, 1 cylinder for the tail, 1 cylinder for the neck and 1 rectangular prism for the head.

For simplicity, the interviewer suggested that I used only the body area to calculate the number of hairs.

The area around a cylinder equals: π x diameter x length.

Each of the cylinders' two lids has an area of: π x radius^2.

Therefore, the total area of the cylinder equals:

π x diameter x length + 2 x π x (diameter/2)^2.

I assumed the smallest dog in the world to be a newborn Chihuahua with a length of 10 cm and a diameter of 3 cm. Thus, the area of the newborn Chihuahua is (the interviewer allowed me to use π=3) 103.5 cm^2.

For the largest dog in the world I used an adult Saint Bernard with a length of 150 cm and a diameter of 50 cm. The area in the Saint Bernard's body is, therefore, 26,250 cm^2.

Then I ran into the problem of estimating the number of hairs in a square centimeter of dog skin. The interviewer suggested that I use 100 hairs. I asked the interviewer whether I could assume that all dogs, regardless of age and race, have the same hair density. He encouraged that to keep the problem simple.

So, according to our assumptions, the newborn Chihuahua has a total of 10,350 hairs while the adult San Bernardo has 2.625 million hairs.

Therefore, there are 2.625 million – 10,350 possibilities for the number of hairs in a dog, which I approximated to 2.61 million possibilities.

Now it is time to find out the number of dogs in the world. I let the interviewer know that I would exclude stray or organization owned (for security, etc) dogs from my analysis because I believe that most dogs live in households. He let me go ahead with my assumption.

I estimated the world population at 6 billion people. I assumed the average household size to be 5 people. Thus, there are 1.2 billion households in the world. I assumed that the percentage of households with dogs in the world was 30% and that the average number of dogs per household with dogs was 2. Therefore, my calculation for the number of dogs in the world is 720 million.

I now had the answers to the two parts in which the interviewer suggested that I divide the question but did not know what to do with them. I asked the interviewer whether I could assume if the possibilities of hairs in a dog were evenly distributed. The interviewer suggested that the probability was the same for any number of hairs.

I therefore assumed that the number of dogs for each possibility of number of hairs was equal and divided the total number of dogs by the total number of hair possibilities.

The result (720 million dogs in the world / 2.61 million hair possibilities) is 275 dogs per hair number possibility. Therefore, I concluded that YES, there are two dogs with the same number of hair in the world. But what if the question was "are there <u>exactly</u> two?"

How many people have you interacted with over the last year?

Additional information provided (if interviewee asks probing questions):

- *Only count each unique person once (the interviewer complained that HBS students neglected this detail and came up with ridiculous answers like 13,000)*

One Approach:

Break into manageable subcategories and estimate them separately.

- CBS - almost 2,000 students, faculty and admin., assume I interact with 25%, so say 500.
- Social Settings - Events occur once or twice per week, more around the holidays, so say 100 events per year. The average number of people is on the order of 10 per event. Same people at different events, assume I see the average person 4 times. 100 events * 10 people / 4 times = 250 people. Maybe 50 of these people are also at CBS, so round down to 200 people.
- Everyday activities - dry cleaner, supermarket, favorite pizza place, post office, etc. I typically interact with a cashier and server, so assume 2 interactions per visit. Assume 3 errands or visits per day = 20 locations per week, average visit interval is once every two weeks, so there are 40 unique locations * 2 interactions = 80 people. Round up to 100 to account for my neighbors, doorman, my doctor, dentist, and other people I see over and over.
- Random meetings - people who stop you to ask for directions, people you talk to on the subway and people who attempt to steal your laptop or wallet - assume 2 people per week or 100 per yr.
- Other meetings - people you meet on vacation, at sporting events, shows, etc. Assume 50 people.

Total number of people in a year = 500 + 200 + 100 + 100 + 50 = approximately 1,000

How big is the U.S. market for Band-Aids? (the brand)

- Band-Aids are used to cover up minor cuts. Assume that Band-Aid holds 75% of the U.S. market for bandages. The market can be segmented into two main categories of users: kids 16 and under who tend to get cuts more often, and adults over 16 who are more careful.
- Assume that the average life of a person is 80 years, and the population is evenly distributed. That means that kids 16 and under represent 16/80 = 20% of the population.
- Assume that they get a cut once every two months on average. If the U.S. population is 250 million, 20% equals 50 million kids. Once every two months equals six times per year, for a total of 50 million x 6 cuts = 300 million bandages.
- Assume that it takes three days on average to cure a cut and bandages are replaced once a day. That makes for 900 million bandages.
- The adults represent 80% of the 250 million people in the country, or 200 million.
- Assume that they get a cut once every six months that lasts three days, with bandages being replaced every day. That is 2 cuts per year x 3 days per cut x 200 million people = 1,200 million bandages.
- The total number of bandages, then, is 900 + 1,200 = 2,100 million bandages.
- Assume there are approximately 20 bandages in a package, and a package sells for $2. The total size of the market expressed in dollars is therefore 2,100 million / 20 x $2 which is approximately $200 million.
- Band-Aid holds 75% of this market which is equal to $150 million

How many pairs of skis do you expect to sell in the U.S. market as an up-market new entrant?

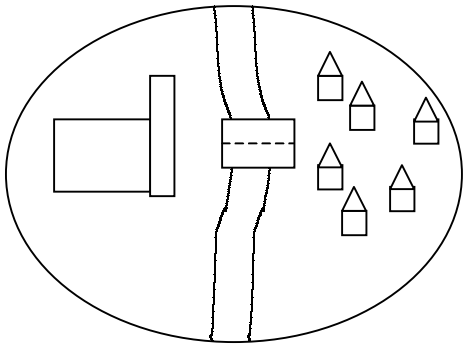
- Assume 250 million people in the U.S. 10% of those people ski which equals 25 million people.
- Assume a pair of skis lasts five years on average. This means that every year 1/5th of the skiing population buys a new pair of skis. That is 5 million pairs of skis per year.
- Now assume that 10% of the skiing population belongs to the "up-market" segment. Also assume that given the fanaticism and riches of this market segment, they replace their skis twice as often as the average person. That means that the market segment is 5 million x 10% x 2 = I million skis.
- Assume there are five major manufacturers in this segment at this time. That means that each sells 200,000 pairs of skis each year.
- Assume that as a new entrant, you will be able to attain 10% of the average sales volume in the first year. That is 10% x 200,000 pairs of skis = 20,000 pairs of skis.

Game Show and Creativity Cases

Picture a small town with a population of 10,000 people in rural Austria. A river divides the town. There is only one bridge with two lanes over this river and this is the only crossing point for several hundreds of kilometers. A factory stands on one side of the river and the entire population lives on the other side of the river.

The mayor of the village approaches you and tells you that the bridge presents a bottleneck to the village during rush hour when people are going to work (i.e. there are severe traffic jams). He wants you to solve the problem without spending a lot of money.

(The first thing I did was to draw a picture of the village.)



Just to make sure I understand this correctly, all villagers live on the right-hand side of the river, only the factory stands on the left-hand side of the river and only the villagers from the right-hand side work in this factory.

- Correct.

Is it possible to build another bridge?

- No. We want to keep this as cheap as possible.

Well, let's start out by identifying when these traffic jams occur. What time do the villagers go to work?

- There are two shifts; the first begins at 8am and the second starts at 9am. Each worker works 8 hours. Then they go home.

Okay. That implies that the traffic jams occur roughly between 7-9am, and 4-6pm. Do all men and women work at the factory?

- No. Only the men.

Assuming 20% of the population is children, we are left with 8,000 adults. Assuming that the gender split in a typical Austrian village is 45% men - 55% women, we are left with 3,600 men that commute over the bridge. Does anyone besides the men have a reason to cross the bridge?

- No.

This means that, given a constant travel rate amongst all the men, roughly 1,800 men pass over the bridge in one hour (3,600 men / 2 hours). This translates into 30 men per minute (1,800 men / 60 minutes) and if each drives one car, 30 cars per minute.

- Okay. So now that you know when and why the traffic jams occur, what suggestions do you have to solve this dilemma? And please be as creative as possible.

(I could tell that I was on the right track. This guy was mainly looking for how creative I could be.) Well, given that most men travel over and back at approximately the same time, the mayor could give incentives to those men that car-pooled. The city could build car-pooling meeting points. This would eliminate a lot of traffic on the bridge. For example, if 3 men car-pooled every day, only 600 cars as opposed to 1,800 would pass over the bridge per hour (10 cars versus 30 per minute).

- Good.

A second suggestion would be to open both lanes to traffic. Between 7-9am, all traffic traveling west to the factory would be allowed to use both lanes. The opposite would apply to the afternoon rush hour period from 4-6pm.

- Good.

A third suggestion would be to subsidize those commuters that walked, used motor scooters or bicycles to get to work.

- Good.

(I could tell that this guy still wasn't all too impressed. I sat there and thought for a moment about my personal life and what experiences I had witnessed. Then it hit me.) My final suggestion resembles something I saw in Santiago de Chile when I lived there. The city had a serious problem with smog and as a result restricted the use of motor vehicles on certain days. But instead of restricting everyone's use, the city gave motorists different colored license plates that could only be used on a specific day of the week. So for example, if your car had a red license plate, you could only drive the vehicle on Mondays, Wednesday and Fridays. If you had a green license plate, you could only drive on Tuesdays, Thursday and Saturdays.

- Excellent! I have never heard that answer before. Good job.

After the last comment, I left the interview with a good feeling. I was lucky that I realized early on that the interviewer was more interested in the creative solutions I could come up with rather than just generic ones.

You have two jars of wine: one of red wine and the other one of white wine. Each one is 100% pure. Now you take a glass and fill it with white wine and put it in the jar of red wine. You mix it and wait a couple of minutes. Then you take the glass and fill it in the jar which had originally 100% of red wine and put it in the jar with white wine. After doing this which jar is more pure with the original wine? (This is, is the jar which had originally 100% of red wine more "contaminated" with white wine or the other way?)

Intuitively the first thing that comes to my mind is that the white wine will be less contaminated with red wine since when you put back the glass of wine it will bring red and white wine…but on the other hand I also have to consider that what's not going back in the glass is staying…Can I change take a couple of minutes to think it?

- *Of course*

I have it now, the answer is the same.

- *That's correct, but how did you get it?*

Ok, there are two ways. First, assume hypothetically that when you take the glass back you are so lucky that you get all the white wine back. Therefore, all the white wine that contaminated the red wine is back on the white wine and we have the scenario of the beginning when they were both the same (100%). Now, lets think that we are less lucky and don't get a little part (lets say 1%) of the white wine. The glass will have 99% of white wine and 1% of red wine. Therefore, 1% of white wine stayed in the jar of red wine and 1% of red wine will end in the jar of white wine. So the final scenario is with both 99% pure. So, it will always be the same.

- *Very good, what's the other way you were thinking?*

Say it's not wine and its ten small balls, 10 red and 10 white. You take 3 white balls and put them with the red ones. Now you pick 3 balls from the 13 (10 red and 3 white) and it happens to be 2 red and 1 white. Both will finish with 10 balls: one will have 9 red and 1 white and the other one will have 9 white and 1 red.

- *Very good, lets go to another case.*

What is 78 times 82? (no paper permitted)

It's about 80 times 80, which is 6,400.

More precise answer [what he was looking for]: It's a binomial so you can solve it as (80+2)*(80-2) which simplifies to 80-squared minus 2-squared or 6,396.

How many handshakes will eight people have to exchange when they are leaving the room?

The first person will have to shake seven hands, the second person will shake six hands, the third will shake five hands...etc.

7 + 6 + 5 + 4 + 3 + 2 + 1 = 28

You have a board of 64 squares of equal size (8 squares by 8 squares). You eliminate two of the board's corners that are diagonally opposed to one another. You are given a limitless number of dominos, which are each composed of two squares (same size as those of the board). Can you fill the board with dominos so that each remaining square is covered? (you may not juxtapose dominos)

No. Think of the board as a chessboard. Think of each domino as a rectangle of one black square and one white square. If you eliminate two diagonally opposed corners of a chess board, these corners will be of the same color (either both will be white or both will be black). Since you are eliminating two squares of the same color, you are eliminating two halves of two dominos instead of eliminating two squares of different color that could have been covered by one domino.

There are two rooms: The Switch Room and the Bulb Room. In the Switch Room are three switches (1, 2, 3), all the switches are marked On and Off, and are originally in Off position. In the Bulb Room there are three light bulbs (A, B, C). You have to match the switches that turn on each light bulb. To do it, you start first in the Switch Room and do what ever you want with the three switches. Then you step into the Bulb Room and without going back to the Switch Room you have to figure out which switch controls which light bulb.

The problem is that there are three unknowns and only two equations. You need extra input. The solution is to turn on two lights, and turn one of them off after some time (let's say three minutes), and leave the third switch off, then you walk into the Bulb Room. There will be one light on which is controlled by the switch you left on. There will be two light bulbs off, but one of them will be warm (the extra input!), which is controlled by the switch left on for three minutes. The last light bulb, which will be cold, is controlled by the switch that you always left off.

You are in a room with two identical closed boxes. The boxes have identical tags that read "NPV of the contents of this box is one million dollars." What questions would you like to ask before you select one?

- What is the discount rate of each calculation?
- What is the time frame (and period length) of the two calculations?
- What is the range of possible outcomes of the two packages?
- What is the liquidity of each of the two packages?

Why are manholes round?

- So that the covers can't fall in the hole under any circumstances.
- So that the covers can be moved by rolling and no lifting is required.
- To provide the greatest opening area for the cost- and weight-limited material used.

Why are soft drink beverage cans cylindrical?

- So that consumers won't cut their hands on the sharp edges. The shape is more comfortable and ergonomical. To maximize the ratio of the container's volume to its surface area short of using a sphere. This delivers more liquid per ounce of aluminum (thus, more per $).
- A sphere would be impractical because it would not stack or stand up after it was opened. Spheres would also require more air space between cans if they were in a box, vending machine or truck - a fact that could increase shipping and packaging costs.
- So that they will roll predictably and in control on assembly lines and vending machines.
- Because this container shape requires the least machining, joining, and finishing steps in manufacturing and is therefore the least expensive to manufacture.
- Circular structures distribute internal pressure. Further, structures with comers could develop fractures due to high stress at the edges.

Tell me all ways, practical or not, which you could use to determine whether a light goes off in the refrigerator when you close the door?

- With the door open, press the button that makes the light go on and off.
- Drill a hole in the door so that you can see inside when the door is closed.
- Find out the mean time to failure for these bulbs, close the door, and open it after the expiration time to see if the light is burned out.
- Go to the production line and perform a statistically valid test (appropriate number of samples) to determine whether the light always goes off (by pressing the button, etc.).
- Hook up and extremely sensitive electrical measuring device to the power source to see if the energy level drops when the door closes.
- Hook wires to the socket and perform a similar test when the door is closed.
- Place a sensitive thermometer (chilled to the refrigerator's temperature before testing) near the light bulb and close the door.
- Place some light sensitive material in the refrigerator to see if it is activated.
- Pick-up the phone, dial the manufacturer and ask if the light goes off when you close the door.
- "If no one is in there to see the light go off, does it matter?"

Useful Facts & Conversions

You do not need to memorize all of these, but you should know the more basic ones such as the population of the United States (or wherever you will be applying for jobs) and how many feet in a mile.

POPULATIONS (2000)

- World 6.2 Billion
- Europe 730 Million
- Asia 3,700 Million
- United States 285 Million
- Canada 31 Million
- China 1,300 Million
- Select U.S. Cities:
  - New York City 8 Million
  - Los Angeles 3.8 Million
  - Chicago 2.9 Million

MEASUREMENTS

- **Distances**
  2.54 cm = 1 Inch
  12 inches = 1 Foot
  3 Feet = 1 Yard
  1 Mile = 5280 Feet = 1.61 Kilometers
- **Volume/Weight**
  1 cup = 8 ounces
  2 cups = 16 ounces = 1 pint (or 1 pound)
  4 cups = 2 pints = 1 quart
  4 quarts = 1 gallon
  2,000 pounds = 1 ton

- **Height/Depth**
  Sears Tower, built 1974 = 1,454 ft
  Empire State, built 1931 = 1,250 ft
  Mt. Everest = 29,028 feet.
  Greatest known depth = Pacific Ocean, Mariana Trench = 35,810 feet
  Ocean depth at deepest point is about 7 miles (remember 5,280 ft/mile)
- **Length**
  Earth's diameter = 8,000 miles
  The Nile is the longest river in the world at 4,145 miles.
  The Great Wall of China stretches over 1,400 miles and can be seen from the Moon.

FACTS AND FIGURES

World's busiest airport - Passengers

1.	ATLANTA	- 80 Million
2.	CHICAGO	- 72 Million
3.	LOS ANGELES	- 68 Million
4.	LONDON	- 64 Million
5.	DALLAS/FT WORTH	- 60 Million
20.	NEW YORK	-32 Million

Wall Street Journal average daily circulation = 1,795,448
USA Today = 1,418,477
NY Times = 1,110,562

Worldwide auto production = 48 Million
U.S. auto production = 20% = 10 Million
Japanese auto production = 14 Million
Europe auto production = 18 Million

75% of Earth is covered in water
97% of that water is salt water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