

Here this is my “best practice” example of this particular case. Again, I had difficulty finding someone who could answer this case as effectively as I wanted to demonstrate in this particular example. I ended up interviewing myself, and so I will play both the role of candidate, as well as interviewer, and you’ll see me jump back and forth between them.

One thing I’ll mention too is that when I interview myself, I actually do interview myself. I literally...it’s really weird. I have the questions that I ask as the interviewer, and then I have a blank piece of paper as a candidate. Obviously, since I wrote the case, I know what the answer is, but I haven’t memorized, for example, all the math, and I don’t have the answer key in front of me when I actually do the real math. So when I’m doing the math as the candidate, for example, I’m actually doing the math. I’m not reading from an answer guide, and so I’m forced to think about how to do it. So you get a more realistic sense of that, so when I ask myself, “Can you repeat the question,” I literally half forgot, I wanted to double-check – I’m just demonstrating the habits that I’m so used to that I want you to be accustomed to too.

So you might sense that sometimes I add little comments here and there as a candidate, and it’s because I truly am thinking like that, and putting myself in that position. So with that, let’s go ahead and look at this particular example. This would be what I consider to be the “best practices” example for this particular case. Let’s go ahead and get started.

Interviewer: The following case is regarding a company that is your client that is in the carwash business. They are based in the United States, they have 100 locations, and currently, they are based near residential neighborhoods.

These locations feature a carwash process that involves the customer vacuuming the interior of their own car, pulling the car up to a washing area, an attendant then takes over and washes some of the more difficult-to-reach places on the car manually, and then a machine washes the remainder of the car. That is how the service works.

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The client’s primary objective is to grow its profits, and as a part of that effort, the company is considering a major technology investment to upgrade its car washing facilities, or car washing system to new equipment. This is the part that washes the exterior of the car. Their objective is to use this to increase their capacity to wash more cars per day, and to do so at a lower cost.

The first question in this case is in determining whether or not the client should pursue this particular investment. What are the important factors to consider?

Candidate: Let me make sure I understand the client's situation. They are a carwash company with 100 locations based in the United States. It sounds like it is a consumer-oriented business. The service involves some sort of capacity for the consumer to clean the interior of their car with the company's equipment. Then the exterior of the car is the core part of the service, where employees and machine-based cleaning systems clean the exterior of the car.

If I understand correctly, the objective is to grow the company's profits, and the client is considering a decision in investing in this technology, I guess with the intention of increasing their capacity, and to clean those cars more cost efficiently.

Did I understand that correctly, or did I misunderstand anything in particular?

<p>You'll notice here, even though I wrote the case, I'm still confirming the facts and confirming the client's objectives. Ultimately, it's a good habit, and for me old habits – and even good habits that happen to be old – die hard, and so I'm still doing that, and would encourage you to do it too. Again, a lot of people miss— fortunately, most people actually get this part right, but a couple basically get a little sloppy and skip this, and I definitely recommend not doing that.</p>
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Interviewer: No, that is exactly right.

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Candidate: Great, so in response to your question regarding which factors are important, would it be okay if I take a few minutes to gather my thoughts?

Interviewer: Sure, no problem, take your time.

Candidate: Given the client's situation, I'm going to start with a hypothesis that investing in this technology makes sense, because it would increase capacity, and reduce costs in the operation of this business.

The key factors I would want to look at to test this hypothesis is: I would want to look at the two components of profitability, which are revenues and costs. I've drawn an issue tree here; the two components I'm looking at the highest level are revenues and costs.

Since the argument seems to be primarily that this is a cost-savings type of opportunity, or capacity-increasing type opportunity, it sounds like most of the issues are on the cost side, so I'll probably look at cost first. The two sections within cost that I would look at are fixed and variable.

It sounds like this is really a shifting of cost, so because the technology requires investment, I would anticipate the fixed costs would go up. In particular, some sort of machinery cost would go up, and my assumption that I want to validate is that variable costs or operating costs for the machinery would somehow be less expensive, and therefore we would make up the savings that way.

So the hypothesis here is that the fixed cost increase will be outweighed by the decrease in the variable costs.

Then on the revenue side (if necessary), I would look at quantity in terms of the volume, as well as prices, and in particular, if this technology somehow changes the carwash experience, such that it provides some sort of advantage to the customers, and an advantage for the client over its competitors, then it could potentially impact pricing or volume.

I don't know if this would make the carwash faster, cleaner, more thorough somehow, or if this would basically duplicate the existing experience in such a way that this is only a cost savings. So I would look at the costs first, and then come back and circle back on the revenues, if I determine there were some qualitative factors that made that worth looking at.

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Notice here in this statement that I explain what data and information I want to see and analyze, and very importantly, why I want it. I do so in a very concise way. Basically, that whole process between stating my hypothesis and stating the logical argument I'm going to use to test the hypothesis – that whole statement took me about three minutes. And when I compare that to transcripts of some of the other candidates I've interviewed, sometimes it takes 15 to 20 minutes to do that with some of the candidates I've been interviewing. That's *way* too long. In this format, I would estimate that you probably have between five to seven minutes to state your hypothesis, state your structure, and to justify your structure, including some for the interviewer to ask you some questions.

What happened was: in the other interviews, because I'm using them as a teaching example and not just an interview, I would ask these candidates follow-up questions to pull out of them their answers, thinking that maybe they had these thoughts they neglected to share. In practice, what would happen is the interviewer would say at the 6- or 7-minute mark, "Great, let's move on." They will literally cut you off in mid-sentence in some cases. If you are pretty close, and need another 10-30 seconds to finish your thought, they probably will let you do that. But if you are off the mark, they won't have the time to ask you follow-up questions to help you get to the right answer; they will just cut you off. So just realize that that could happen, and so you want to make sure you have the right

answer and state it concisely, and state it proactively, because that way you don't waste time having the interviewer ask you questions that you should have already anticipated and answered, without the interviewer actually opening their mouth at all.

Interviewer: You mentioned pricing as one potential factor in analyzing this decision. What in particular would you be looking for in pricing, and how might that impact your overall recommendation?

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Candidate: Let's see, given my hypothesis is that this opportunity is worth doing to increase capacity and save on costs, my hypothesis would be that if this provides the same cleaning experience as the current technology, then there is probably not a strong reason to change pricing that would be warranted.

What we would look for then – if that was true, if pricing was flat – then I would expect the cost savings to be substantial enough to justify the investment. On the flip side, if the technology does provide some sort of competitive advantage, then you could argue there might be a potential to increase the price – maybe offer a premium carwash, rather than the current one. That might provide a secondary benefit to the investment opportunity – not just an improvement in cost savings, but also an improvement in pricing power, which would impact on revenues.

Here in hindsight and reading the transcript on this, what I should have said and neglected to say, originally as a candidate, was that this might provide a secondary benefit to the investment opportunity, not just an improvement in cost savings, but also an improvement in pricing power, which could impact on revenues and profits. So I forgot to mention the phrase “and profits,” and I wanted to make sure I included that in this particular commentary.

Candidate: So the question here really is: is there one major benefit on the cost side, or are there two – cost and revenues associated with this particular investment opportunity?

Interviewer: Okay, that makes sense. Let me ask then, on the cost side, what do you think would be the major components of cost that you...I think you identified two categories, fixed and variable, what do you think would be the major components of cost for a business like this?

Candidate: On the fixed cost... I'm just trying to picture a carwash in my head. There clearly are the land and real estate costs, assuming they don't already own it. So that would certainly be one cost. The cost of all the equipment would be another cost.

The maintenance of the equipment I guess would be... yeah, let's argue it is a fixed cost, although it could be variable as well; and maybe ancillary overhead, insurance, and things along those lines.

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On the variable side, I'm thinking of the costs that increase as you have more carwashes. Electricity comes to mind, water, so those two utilities would be potentially important. Certainly labor, and if I recall from the description, there were some employees involved in the process, so that probably is a pretty big variable cost as well.

Interviewer: That seems to make sense. Of the costs you've mentioned, which one do you think would be the most important cost to analyze?

Candidate: Considering this is an investment, and presumably not an inexpensive investment, I would expect the machinery costs would go up, or perhaps the financing costs for the machinery, whether it is a lease or loan, would go up. So something would go up on the cost side – on the fixed cost side – to represent this new equipment, and so I think that would be pretty important to better understand on the fixed side.

Then on the variable, unless the water and power savings are enormous, my hypothesis would be that I hope to see some significant labor cost savings, or the same labor costs but a lot more capacity and a lot more throughputs through the machines. So that would be what I would be expecting to see there.

Overall, I would be expecting the increase in the cost of the new machinery would be relatively moderate, and hopefully the efficiency improvement on the variable costs, perhaps for labor, would be lower or if not lower, at least the capacity that you could wash would be higher, even if some of the variable costs were similar.

So I would be looking for some combination of either a capacity improvement, or labor cost savings improvement to outweigh the increase in the fixed costs.

In this particular statement, what I've done is I've identified to factors that I'm looking for that would justify my recommendation, and I explain the relationship between those factors.

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So what I've done here, it's a phrase I use (it's not industry phrase or anything like that), but I often use the phrase, "connecting the dots." Once you hear what I say, and I explain the linkages and relationship between these factors, it kind of makes sense. So, "to justify this investment, either I'm looking to

improve capacity or to reduce cost savings in such a way that these two benefits would outweigh whatever the incremental investment would be.” Once it’s that clear, it is a lot easier to grasp what I’m trying to accomplish.

The key thing is I not only identify the key factors, the relationship between the factors I’m considering, but I’m connecting the dots, and I did it *out loud*. I find a lot of candidates – this same thought will occur to them, and actually, a pretty high percentage of the candidates will have a thought very similar to this. But I find a minority will actually have either the habit or presence of mind to actually state it out loud, and state it out loud in a clear way that’s very easy to understand. So that’s the point I wanted to emphasize in this last particular set of sentences.

Again, I would encourage you to go back and re-listen to it and re-read it, just to look at the particular choice of words and to hopefully see that it’s clear, but also to better appreciate *why* it’s clear, so that you can replicate that process in your own interviews.

Interviewer: Let’s go ahead and look at Exhibits 1 and 2, and I would like you to look over those two exhibits with the following question in mind. What insights and conclusions can you draw from those two exhibits? Feel free to take a minute or two to look over that.

Candidate: Great, just give me a few seconds here to take a look. So just glancing at this, a couple of things jump out in no particular order. It looks like given the current technology has the capacity of about 100 cars per day, it looks like during the weekday, the client is severely under capacity, and that seems a little unusual. And weekends seems to be at capacity, or at least the revenues we’re seeing are at capacity, so it’s possible there might be more demand on the weekends that we’re just not getting.

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So this feels like it is a weekend type business -- that’s the first thing that comes to mind. It looks like the costs seem relatively fixed. I wonder if the labor costs could be variable; you can’t really tell from here. Real estate seems like it’s there, and actually the water and electricity is fixed, and that seems interesting as well.

It sounds like if you can’t really change the real estate costs or water and electricity, then your two potential changes in cost are in your labor costs and your equipment loan costs. It looks like right now, there aren’t any equipment loans costs, so it sounds like the equipment is already perhaps paid for. So that suggests that in theory that this is— at least on the equipment cost standpoint, there isn’t any. So this would suggest the current technology is more favorable in one respect, that there is no overhead for carrying it, which would suggest then

that any new technology that did have some sort of equipment cost would have to be even more efficient to offset that incremental equipment cost.

I guess the last thing I noticed was that it doesn't appear that the business is very profitable. If I did my math right, I see we wash 400 cars in a week at \$10 a car, so it is \$4,000 in sales, and weekly costs seems to be around \$4,200. So what I'm seeing here is a \$200 loss per week.

So those are just some of the observations I noticed at first glance.

This last statement, I would encourage you to study this very carefully. Notice two things in particular – I have referred to specific facts, and I have made what hopefully I think are insightful commentaries (or at least that was the intention). In the transcript version of this particular example, I have underlined the sentences that I felt were “insightful.” Rather than just restating the facts, explaining what those facts mean, I think it is very much worthwhile (and I have done this in a couple of places, particularly for this particular case) underlining the insights, because there were a couple.

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So verbally, let me explain and point out some of the phrases I mentioned earlier that I felt were insightful, just so you get a feel for that. It is hard to make sense of this in my commentary. It's easier if you read the transcript and see the underlines, so that you get a sense of where that incremental additional value add is that I'm providing as the candidate – that is insightful and that interviewers notice. You'll notice it's just one logical step beyond the obvious facts. So it's very small, but it makes a big impact.

So early on, as a candidate, I said, “During the weekday, the client is severely under capacity, and that seems a little unusual.” So the facts clearly convey that, but I'm pointing out that this is something that is bothering me, and pointing out that it's something we want to pay more attention to.

I also say, “There might be more demand on the weekends that we're just not getting.” So we know here that the demand of customers that are buying is equal to our maximum capacity. What we don't know is: is that all the customers that have shown up, or did more customers show up but we couldn't handle it so they went away? That's unclear, so I make that point, indicating that there is a little bit of uncertainty there that we want to further explore at some point.

I then make the statement that says this feels like “a weekend type business.” Sometimes it's easier to label something, which makes it easier to grasp. So this is the business where it's really busy on the weekends, and not so busy during the week, and that implies certain things. It implies things like, “you're really slow during the weekdays, should you do something about it?” Or, “do you make all your money on the weekends, should you not focus on the weekdays, and make sure you really make a lot more on the weekends?” So I make that particular statement.

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Later on I mentioned— we talk about the equipment cost, and that under the current equipment and current situation, there is not a lot of loan costs or no loan costs. I make the observation that perhaps “the equipment is already paid for,” which is an observation derived from that information. Then I go on later to say, because the equipment is already paid for, that, “There is no overhead expenses for continuing to use the equipment, which would suggest that any new technology that did have some sort of equipment cost would have to be even more efficient to offset that incremental equipment cost because currently we have *no* costs.” So that is again taking that logical fact and going one small step further to point it out.

Now you could say that that seems pretty obvious, and maybe it is and maybe it doesn't. I would argue it is perhaps factually true, but perhaps not being emphasized enough. So much of what you do as a consultant is bring emphasis and bring focus on the things that make a big difference.

The final phrase I mention here that I define as insightful is, “It doesn't appear that this business is very profitable.” Then I went on to do the math to explain *why* it was not profitable. Again, that is an important observation and insight to make. The facts are there that supports this, but the words: “This business is not profitable” is not spelled out anywhere in the original exhibits. So what I do is I verbally spell that out here.

Interviewer: From a capacity standpoint, I'm curious, do you think this client has a capacity problem?

Candidate: I think they have potentially a capacity problem and potentially not. I think they have an under- *and* an over-capacity problem at the same time. Here is what I mean: on the weekends, they seem to be at capacity, so presumably there might be some incremental demand there that the client isn't getting because they can't handle the volume. But at the same time, they are only at 40% capacity during the weekdays, so my guess is the weekends are probably going to be a lot more profitable than the weekdays because one is at full capacity, and one is at low capacity.

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In a business with a very high fixed cost, you generally want to have as much of that capacity utilized, in order to maximize profitability. So I'm seeing sort of both situations on different days of the week happening for this client.

Interviewer: From your perspective, what implications does that have for the client, in the recommendation you would make?



Candidate: Let me go back to my premise. The objective is to increase profitability, and my original assumption was the business was already profitable, and we are trying to make it more profitable. But in fact, it looks like the business right now isn't profitable at all.

What it suggests is: any kind of costs savings, for it to be profitable, would have to be a pretty big savings. Not only do you have to cover the cost of the equipment, but you have to cover the fact that the business itself isn't profitable. So I would hope that that's a pretty efficient piece of equipment you're considering.

So that last sentence was another example of an insight. I stated it probably a little more casually than I would have done, if I had to do it all over again, but at least it expresses the sentiment, and shows the impact of the information we've discovered so far.

Candidate: So you want to make sure the cost savings would be pretty substantial. And I believe from my notes and my hypothesis that the rationale for the decision in the investment was to increase capacity. Assuming that is the case, it sounds like you potentially only have capacity problems two days out of the week, on the weekend. And five days out of seven, you don't, at least from what I can see.

So from that standpoint, I do start to doubt a little bit whether an investment in capacity makes the most sense, considering you don't have a capacity problem five days out of seven potentially. So those are sort of my initial impressions based on what I'm seeing so far.

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Here I reference specific facts in making my point. This is another insight, incidentally, "you don't have a capacity problem five days out of seven." So the fact that you mention five days out of seven and that there is no problem, is a slightly clearer way of looking at the situation. Now you can look at the facts and say that's true, but seeing it that clearly and concretely really, I think, brings the point home. Basically what I'm implying is: You do not have a capacity problem five days out of seven, so why are you bothering investing money into solving a problem that only exists two days out of seven? Why don't you fix the problem that appears five days out of seven, because it happens twice as often? Actually in hindsight, I probably should have said that, but that wasn't the thought that was crossing through my mind.

So sometimes bringing these points home makes a really big difference. What I find is: when I make an insightful comment, I find, particularly amongst candidates and the students that I teach, that the majority of people will not find

the remarks surprising, meaning: they will have noticed the exact same facts I did that led me to make that insightful comment. But the difference is: it didn't occur to them to say it out loud, or if they said it out loud, it wasn't as clear as it could be.

This is an important distinction. It's not that they didn't see the point. It's like the majority of folks notice the exact same thing that I noticed, and again, the very subtle difference is they never bothered saying it out loud, or didn't do a good job saying it out loud. And of the two, I find the bigger problem is that it just doesn't occur to people to say it out loud. "Oh yeah, I did notice that," "Yeah, I did think that was a little unusual," and "Yeah, that did bother me a little bit." Great, but you don't get points for *thinking* these thoughts! You get points for saying your thoughts out loud. So that's a very important thing.

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By the way, I got some emails from PhD grad students who – that was their big takeaway, in looking at some of the mock interviews and recordings I've done, that they didn't realize that they had to say these things out loud, or that you *could*, or to role model someone saying it out loud so you have some context for how you're actually supposed to do it. Sometimes it can feel a little awkward to answer a question that perhaps wasn't asked, but is the more important question, which happens all the time with clients. So that point is very important, and I want to make sure you're aware of the importance of communicating what you're thinking in a concise way, and not just thinking about it silently, because you can't get an offer thinking about it silently; you have to say it out loud.

Interviewer: Great, what I would like you to do now is refer to Exhibit 3, and I would like you to take a look at that, those two scenarios. The question I want to ask is: assuming the number of carwashes per week remains the same, the question is: should the client invest in the technology?

Candidate: Okay, let me take a look at this, and see if I can answer that question. Would it be okay if I took a few moments to take a look at the exhibits, and gather my thoughts?

Interviewer: Sure, no problem.

Candidate: Great. I'm sorry, can you repeat the question you wanted me to answer again?

Interviewer: No problem. Assuming the number of carwashes sold per week doesn't change, should the client invest in the technology?

Candidate: Okay great, let's take a look at that. The question is: should they invest in the technology? You would want to know, basically, which scenario is more profitable. We're looking at profits of the current technology versus the profit of

the new technology, and to understand the profit of the current technology – that is a function of revenues minus costs.

And revenues are a function of...let's see, we said the quantity doesn't change. Are we to assume there is no price change as well?

Interviewer: Assume the price remains the same.

Candidate: Okay great, so revenues is equal to price times the quantity and...

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I just stated something very important that I want to point out – it was very subtle. You'll notice in my last comment that I stated specifically that "revenues equals price times the quantity." What I'm doing here is: I'm stating what I call a "word-based math formula" before I state the numerical math formula and do math computations. It is an extra step, but it is a step that I think is very worthwhile doing for two reasons.

One is: if you state the verbal equation, the word-based equation you're going to use – and write it down, very important write it down – then you're less likely to be confused as you do lots of computations.

Secondly, from a communications standpoint, when you explain verbally with words the formula you're about to use, before you actually do the math, it's easier for the interviewer or the client to follow your logic, your approach, and then ultimately the numbers. If you just start jumping into numbers, it's very hard for someone else to follow: what are you thinking?

The reason for that is: sometimes in certain computations, you can calculate them a couple of different ways, and they are all mathematically correct. If you just start going to numbers, it's very hard for someone else to follow which way you're using. If you use words first, we get the conceptual approach you're trying to use, we can agree or disagree, and then we can just watch your numbers to make sure you get it accurate or not. So that is a habit again. It's worth stating verbally, and it's worth writing down the word-based formula.

So what I would literally do in my notes – I would write the phrase "revenues equals price times quantity," and then underneath it, I would write the words "revenue equals" in this particular case "\$10," which is the "price times quantity," which is "\$400." Then on the next line, I would write, "revenue equals \$4,000." So you see that at any stage of the math computation, I'm not skipping steps, I'm starting with the word formula first, and it's a few extra words and phrases to write on the piece of paper, but I find it's worth the extra effort, because it totally eliminates confusion, particularly with a problem that has multiple parts. By the time you solve the fifth part, it is easy to forget what your answers were on the first couple parts – in fact, what was even the *question* in the first part. So having those detailed notes, I think helps quite a bit.

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Candidate: ... the price is \$10 and the quantity is 400 carwashes per week, which means the revenue equals \$4,000.

On the cost side, under the current technology, we're looking at total daily costs of about \$600, and total weekly costs of \$4,200, and those seem relatively fixed, so we will subtract the \$4,000 from the \$4,200, and we'll see the current profitability is a loss of \$200 per week.

Profit with new technology is also equal to revenues minus costs. Revenues would be the same, because price and quantity are the same, so that is \$4,000 in sales. The costs here are \$4,550, and so there is also a weekly loss, but this one is much bigger, at \$550 per week.

So based on this, it seems like keeping the current technology, I was going to say is "more profitable," but "less unprofitable" would probably be more accurate. With the current technology, you are only losing \$200 a week, but with the new technology, we're losing \$5,500 a week, and why is that happening?

You're definitely saving on labor costs by \$150 per day, but the equipment cost is \$200 per day for the first five years. So at least in the first five years, the labor savings is smaller than the equipment costs. Really it sounds like so far, you'd have to wait at least five years for that situation to reverse itself.

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And it looks like here you have more capacity with the new technology – 50% more capacity – but looking back at our demand, you only potentially have a capacity problem maybe on the weekends, and five days out of the week you don't.

It sounds like here under the current demand, the current technology is less unattractive. We're investing in newer technology when we don't necessarily need it ... because we don't have as much demand. Right now, the labor cost savings do not outweigh the equipment cost savings.

In this last set of statements as well, there were a number of insightful comments. Again, I underlined them in the transcripts so you can see which points in particular I would consider insightful. Hopefully, it reflects clearer thinking. Let me mention a couple of the points verbally, so you can sort of be

attuned to that, and these are the additional statements that I find most candidates typically would notice and would agree with, but a lot of candidates would not have actually said it out loud, particularly in this concise way.

So there was a phrase here that said, “At least in the first five years, the labor savings is smaller than the increase in equipment costs. Really it sounds like so far, you have to wait at least five years for that situation to reverse itself.” So that’s an insightful way of describing the mathematic relationship I’m seeing in the data.

I also say here that, “you have more capacity with the new technology – 50% more capacity, in fact – but looking back at the demand, you only have a capacity problem on the weekends – two days out of the week – and five days out of the week, you don’t.” If I were saying it all over again, I would say that, “You’re solving a problem that doesn’t happen all that often. In fact, you have other problems that occur more frequently.” So that’s another way of making that same observation.

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Then this last phrase I mentioned was, “Right now, the labor savings do not outweigh the equipment cost savings.” That’s a pretty efficient use of one sentence, and that really explains why I make the particular recommendation that I do.

Again, if you can pay attention to these particular phrases and train yourself to notice them, and take the extra mental step of saying it out loud (which is actually the habit I’m trying to build and emphasize here), you’ll find your statements much more concise, and much more impactful.

Interviewer: Okay, that makes sense to me. Given that, should the client invest in this technology – if yes or not, how come?

Candidate: Based on what we’re seeing so far, it doesn’t make *any* sense to invest in this new technology; you’re better off keeping your current one. But it does beg the question – even the current technology is not profitable, so the bigger issue, I think, is not whether or not we should invest in technology, but rather: how do we get this business to be profitable or at least breakeven?

I think that would be a parallel question that comes to mind.

Interviewer: Along those lines, let me give you a couple a scenarios that I would like you to do some computations for, to see if we can figure out what to do for this client.

Let’s assume prices increase by \$2, and volume drops by 10%. What is the weekly profit, with or without the new technology, and which one is more profitable and why?

Candidate: Let me make sure I got that right. We're saying that the price increases by \$2, and we have a 10% drop in volume. Is that right?

Interviewer: Yes, that's correct.

Candidate: And that applies under the current technology, as well as the new technology. In both cases, the price goes up by \$2 – from I think it was from \$10, to \$12 – and in both cases, the volume drops by 10%. Is that correct?

Interviewer: Yes, that's correct.

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Candidate: Okay, let's see if we can work through that math. We have the current technology versus the profit of the new technology. Profit of the current technology is revenues minus the costs, and in this case, revenues is a function of price times quantity, and we said the price is now \$12 and the quantity has declined. So we were doing 400 carwashes – we're now down 10%, so 90% remaining – and so that means it is \$12 times 10% less, and 10% less is 40 less than 400, or 0.9 times 400, so that's about 360 cars. So we're looking at a revenue of... we're doing  $360 \times 12$ ... we're looking at \$4,320 in revenue with the current technology.

Now when you subtract out the costs... and it looks like the cost structure assumptions really haven't changed. So \$4,320 in sales, minus \$4,200 in cost... so it equals a profit of \$120 per week.

And on the new technology, it is also revenues minus costs, and since revenue is a function of price times quantity, and since those are the same as in the prior scenario, a \$2 increase in price – so it is \$12 – times another 360. So our revenue really should be identical in this situation – so that is \$4,320, based on my prior calculations – minus a cost of \$4,550, which is a profit of... let's see here, that is \$230, I'm sorry a *loss* of \$230, I believe. Let me just double-check that. Yes, \$230.

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So if we increase the price by \$2 (20%), and drop the volume by 10%, suddenly the current technology *is* profitable, but the new technology remains unprofitable – but it is still better than under the old pricing.

Here I want to point out this last sentence, which I stated right after I solve the math problem. It is a summary statement, a little bit of a “mini-synthesis statement,” if you would. What I say is, “If we increase the price by \$2 and drop

the volume by 10%,” – what I’m doing here is restating the original question, the problem I was asked to solve – and then I’ll finish the rest of the statement, “under the current technology this change would be profitable, but with new technology, this particular pricing change would remain unprofitable, but less so than the under the original pricing scenario.”

What I’ve done here is re-summarized what this number means. Here is what most candidates say – most candidates will say, “That equals a loss of \$230,” and not say anything else. Now if I say, “That results in a loss of \$230,” what does it mean? Now when I make the statement that I just did, again no one disagrees with it because it is factually supported, but yet very few candidates will actually say that out loud. Again, it’s a subtle habit, but an important one I want you to get used to doing, hopefully replicating it in your own interviews.

Candidate: What is happening here, it sounds like, is: a price increase of \$2 is 20%, so we’re getting a 20% lift in revenue from the price increase, but we’re losing 10% of sales because of a volume drop. So it is a bigger impact on pricing, which is why under the current technology, it suddenly becomes profitable. And under the new technology, which is based on a capacity expansion, we’re actually shrinking the amount of capacity needed.

**00:38:08**

And on the new technology, looking back on Exhibit 3, we’re seeing again that we’re having to pay for the equipment cost, which is higher. And so with the drop in demand, or volume rather, then we’re seeing that it is still not very profitable.

Here what I’m doing is identifying the primary driver or primary cause behind the numbers, and doing it qualitatively. I find that I actually do this quite a bit. I’m constantly bouncing back and forth between qualitative and quantitative. So if I’m asked to solve a quantitative problem, after I solve the quantitative problem, I will give a qualitative explanation of what I did, what it means and what I’ve discovered. If I am asked to solve a qualitative problem – “Conceptually you have these three factors, which one do you think would be most important?” My inclination is: after I answer or solve a qualitative issue, I will want to quantify the impact of my qualitative suggestion or my qualitative hypothesis. I find this is true of many consultants – they are just constantly bouncing back and forth qualitatively and quantitatively.

I think this comes from the fact that clients tend to whipsaw, and do one or the other pretty extremely. Some clients will be so obsessed with the numbers, they’ll forget what the numbers mean – so you have to bring qualitative context to the numbers. Other times, I’ll have clients who are having a qualitative debate –

“I think we should offer this product versus that product,” and they will have debates around their opinions, with no facts or quantitative analysis to settle the opinions.

So as consultants, we’re constantly in the middle – going back and forth between the two. So whenever you make a quantitative statement, think about: “Is there anything qualitatively I want to mention?” And whenever you make a qualitative statement, think about “Can I quantify this qualitative statement in any way?”

**00:39:58**

By the way, this is where sizing and estimation-type questions come from. So you would say things like, “Well, my hypothesis is: a price increase would make sense, and therefore that’s my hypothesis”. Then the estimation question would come in – “Let’s say you were able to do that, best-case scenario if you raised prices and didn’t lose any revenue or any volume, what is the most upside you can get? What is the least upside you can get?” And so constantly trying to quantify the qualitative, and trying to qualitatively describe the quantitative is a good technique to get into.

Interviewer: Okay, let me ask you another scenario. Let’s say that the client is able to decrease prices by \$1, and that the daily volume of carwashes sold increases by 30%, but only on days with sufficient capacity to process that additional volume. What is the weekly profit, and should the client invest in the technology – yes or no?

Candidate: Let me make sure I understand this. We’re saying that in this scenario, we’re reducing prices by \$1, and we are increasing volume by 30% -- only when there is capacity? Did I understand that correctly?

So here I’m restating the question I have been asked to make sure that I understand it, which I find quite ironic, considering I’m interviewing myself, but old habits die hard. A good habit is always to make sure you understand the question you’ve been asked, before you go about solving it. Particularly quantitative ones, because very slight changes in words can completely change the numerical meaning of the question, and ultimately the answer.

Interviewer: Yes.

Candidate: Okay, let’s figure out the profitability of the two scenarios. We have the current technology, and then we have the new technology. So current technology profit consists of revenues minus costs; and on the revenue side, prices go down by \$1, so revenue is a function of price times quantity. Price is \$9, times quantity, and the quantity – the volume goes up by 30%, but only if there is capacity available.

**00:42:14**



Let's take a look back at my chart here on Exhibit 1, and let's see.... on the weekday. 30% increase is...we have enough room there. On the weekends, we're already at capacity. So it's really an increase in volume only during the weekdays.

So quantity is basically a function of the weekdays... weekday quantity plus weekends – and so it is \$9, times the weekday quantity, is:  $40 \times 5 = 200$ . So that is 200 times 1.3, plus the weekend (remains the same at 200), and so that is \$9 times 200 times 1.3 – 30% would be 60, so 260 plus 200, so that's \$9 times 460... let me figure out what that is. So 460 times 9 – so if I'm not mistaken, that should be \$4,140... and so that's \$4,140 in revenue minus costs.

So under the current technology, the costs are \$4,200 per week, so the profit is: we're looking at a \$60 loss.

So let's compare that to the new technology. We want to know what the profitability is, which is a function of revenues minus cost, and we know the costs are \$4,550.

**00:43:53**

Revenues = price times the quantity. Price we know is \$9, and now we need to figure out what the quantity is. 30% increase in the volume is no problem in the weekdays, because we have ample capacity. Then on the weekends, we normally do 100 cars, but we have the ability to service...there could be a demand for 130, and with the new technology, we have enough capacity. Really it is the same increase across the board, under the new technology.

So that is 400 – the quantity is 400 cars per week, times 1.3 for a 30% increase, and so that is \$9 times 520 cars (400 times 1.3), so let's do the math on that one. That is 520 times 9, so it is \$4,680 in revenue, minus \$4,550 in costs, so this would be profitable. The profit would be \$130 per week.

So we're comparing a \$60 loss with the current technology, with \$130 profit on the new technology.

Under these conditions, it would make sense to go ahead and invest in the new technology. And compared even to our last scenario, \$130 in profit is still more attractive than the \$120 in profit under the old technology with the price increase.

So of all the scenarios, it looks like investing in the technology with this price drop would be the most profitable solution or scenario so far.

Interviewer: That seems to make sense. Let me ask, you indicated that the new technology makes sense under these conditions. What is really going on here? Why is the new technology suddenly more profitable, when before it wasn't?

**00:45:53**

Candidate: That's a great question – let's take a look. Going back to our assumptions, we were dropping the price by \$1, which is about 10%, and we're increasing quantity or volume by 30%, so in this case, there is more of a volume increase than a price decrease. And it looks like under the new technology – the new technology is more sensitive to volume changes than price changes. It looks like it is the general direction of the trend.

Under the current technology, the opposite is true. It looks like a price change has a bigger impact than the volume change. Let's see if that makes any sense. Yes, that does make sense, because the volume increase is muted or capped because under the current technology, once they are over 100 cars per day, they can't service it, and so they hit a ceiling on any revenue uplift from the volume. But the negative price impact is a very real one that impacts all the sales. So that makes sense on the current technology.

Then on the new technology, because there is more capacity in the technology, it can handle the increase in volume without constraint. And because most of the costs are fixed, they are closer to utilizing their full capacity, which is when things tend to be more profitable – when you have a high fixed cost, you're hoping for a very low variable cost.

So it sounds like it is using up *more* of that fixed cost capacity, which is why you're seeing that profitability there.

Interviewer: Okay, I think I understand your point. Let me ask you, stepping back for a second – in deciding whether or not to make this investment, what other factors might you want to consider before making a final recommendation?

Candidate: If I can take a few seconds to gather my thoughts?

Interviewer: Sure, no problem.

Candidate: Okay, I jotted down several other factors (I want to be really thorough) that it would be helpful to consider. The five broad areas are: competitors; customers; products; the nature of the investment; and, what I call the “day of the week problem.” So let me go through each of those.

**00:48:00**

In the interviewer-led case format, there is always going to be – not always, but often – a question that is designed to test your business acumen. Test your judgment. Test your common sense. Or stated differently, to ask you to brainstorm about something. In this particular situation, they are truly asking you for a range of ideas, the breadth of your thinking, and not actually asking you to test any of them. So first, realize that’s likely to happen; and second is: pay very close attention to how I answer the question. Most people, when they are asked to brainstorm a list of factors for whatever reason, they will just start naming lots of different factors. That can be acceptable, by the way.

The better way I recommend is doing the following, which is: indicating the number of categories of ideas you have. So there are three categories, or three types of answers I would like to give. Then stating the names and labels for each of the categories – and in this particular last example, I had five of them – and stating them by title. Then go through each category, and then list your ideas within each category.

In this particular case, I say, “There are five broad areas I would want to consider. The first is competitors; the second is customers; the third is products; the fourth is the investment; and, the fifth is the day of the week problem. Let me go through my ideas for *each* of these categories one at a time. First, from competitors...” then I say my thing. “Next, for customers...” and I give them my ideas. “Then, for products,” I say, “These are my ideas... then on the investment side, here are my other ideas... and finally, the day of the week problem, these are my final ideas.”

Most candidates will just list all ideas, not organized in any particular way. I find the better way to do it is to group your ideas into categories, label each category, count how many there are, and then start with the count of how many categories there are.

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Now this is more difficult, more challenging, because you have to think of the range of your answers, and rather than just speak out loud, you have to basically maintain quiet for a little bit longer, group them into their natural groupings – preferably if the groupings be at least somewhat MECE. It doesn’t have to be perfectly MECE, but if it has some element of that, it would be beneficial. Count how many categories you have, and then state the number of categories, the category names, and then the ideas from each category.

So the communication process is in the exact opposite order of the thinking process. When you think about these things, you typically think about all the ideas, and then you think about the categories, and you label the categories, and count up how many categories you have. So the very last step in the process – how many categories you have – is the first thing you want to say when you actually communicate it.

Again, not everyone thinks this way – some people actually do think in categories. Sometimes I do; other times I just think about of ideas and kind of infer the categories. So regardless of which way you do it from an articulation standpoint, it is: number of categories, the names of the categories, and then the ideas within each category. And have your categorization structure preferably be somewhat MECE – mutually exclusive and collectively exhaustive.

Candidate: From a competitors' standpoint, we still haven't figured out: do they have the same technology we currently have, or have they already moved to the new technology? If they've already moved to the new technology, that might indicate why the current business is unprofitable. It would be useful to know if the competitors are profitable under whichever technology they happen to be using. Finally, what would competitors do if we make this investment? Are they going to follow suit, and copy our cost structure? In which case, what we're really doing is: we have a temporary advantage, but that goes away. Or if this is a change that: we could have a permanent advantage, if you would, over our competitors. So that would be useful to know, whether it is a good decision in the medium and long run.

**00:51:51**

Second area – it was around customers. I'm curious which segment of the market we're appealing to – the technology we're going to have, is it more in line with what those customer segments want? Is there a different segment that we might be targeting instead that might value what we have to offer? I would be curious to know which segments they are, how big they are, and what kind of carwash experience they are looking for, compared to what we are able to offer now or in the future.

From a products standpoint, I would be interested in knowing if this technology creates a different carwash experience, or are we sort of replacing the existing capabilities, but in a more cost efficient manner? The reason that is important is: if we're just going to change the existing— if it is the same carwash, just cheaper, then really this is a cost savings play that has an impact on profitability on the cost side. But if we're changing the total carwash experience somehow – washing them faster; automating washing the interiors, not just the as the exteriors (something along those lines) – then we have a potential to grab either more market share and more volume, or potentially change pricing through a price increase.

So if we did know there was a different service experience, then we might be able to improve profitability from both sides of the table – both reducing costs as well as improving the revenue side.

And in terms of the investment, we didn't really get into the useful life span of the new technology. Does it last only five years? Is that why the loan is only for five years? Does it last 30 years? If it lasts 30 years, then it's even more in favor of making the investment. You're not as profitable in the short run, but you could potentially be very profitable in the 5- to 30-year timeframe.

So I think part of this depends on the client's ability to finance any kind of losses, although that certainly would not be my first preference. But it could change my answer if there was sufficient capital, and the useful life span of the equipment was sufficiently long.

Finally, the one issue I keep coming back to is what I call the "day of the week problem." What I noticed is that whether new technology or old technology, the demand in the middle of the week is really low. And we know there is some degree of price sensitivity – where you change prices, and then volume can fluctuate quite a bit.

**00:54:03**

One question I have in my mind is: is there any other way we can solve the "day of the week problem" first, before making such a large investment in technology? Can we have tiered pricing, a weekday special, that sort of thing? Or serve a different market segment during the week so we get all that excess capacity? That would be an issue worth exploring at some point, which would improve profitability of the core business, and then the technology would obviously improve even further when there is sufficient volume going through the entire system.

So those would be the five areas I would look at – competitors; customers; nature of the product; terms of the investment; as well as, trying to resolve the "day of the week issue."

Finally, in closing out this particular brainstorming exercise, notice the last sentence of my answer, which was, "So these will be the five areas I would look at – competitors; customers; nature of the product; terms of the investment; as well as, trying to resolve the 'day of the week issue.'" So that's what I call an "end point." So you opened with: "Here are my five categories, here is what I plan to cover," you brainstormed your ideas in these five categories, and then you say, "Guess what I just did? I basically covered these five categories." This is a technique I learned actually from a public speaking class in school many years ago, which is: tell them what you're going to tell them; tell them; and then tell them what you told them.

So Step 1 is to tell them what you're about to tell the audience; Step 2 is to actually tell them; and Step 3 is to tell them what you just told them. So it's a useful way to communicate because what it does, incidentally, is it shares the structure of your communication in advance of actually communicating the content. And at the end, you're reminding them of the structure that you just communicated to them. So if they get lost in the details, they can grasp onto the structure, and it makes it much easier for them to follow what you are about to say and what you just said.

**00:55:59**

Interviewer: Okay, great; that is very helpful. Let's say you're walking down the hallway, and the client runs into you in the hallway and asks, "What have you learned? And more importantly, what should we do about this business? Should we make this investment or not?" What would you say in response to that particular question?

Candidate: If I could take a few minutes to gather my thoughts, would that be all right?

Interviewer: Sure, no problem.

Candidate: I would recommend investing in the technology *if* we are extremely confident that we can influence the volume of carwashes sold per location and increase it.

This technology investment decision makes a lot of sense for three reasons. First off, out of all the different scenarios around pricing that we analyzed, we found that investing in the technology while driving more volume through the system was the most profitable scenario.

Second, assuming that the additional volume does materialize in real life, we find that this cost structure is more profitable, even within the first critical five years where we're paying the financing and equipment costs.

Third, after the loan is paid off (and assuming the life span of the technology lasts beyond that), after those first five years, the cost structure is extremely efficient and profitable. We have half the labor costs and no financing costs, and so the margins really do improve quite dramatically after the loan is paid off.

So for those three reasons: 1) the most profitable scenario; 2) profitable within the first five years; 3) profitable after the five years; we feel that investing in the technology makes sense, if we're confident that we can drive the additional volume increase.

Hopefully you're familiar with by now that this is my standard close. You state your conclusion, you state your three reasons, you explain each of your three reasons, and then you restate your conclusion and the three reasons that support it. So this is yet just another example of that.

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Candidate: So the big message here is that volume increase is really critical to making this investment in technology pay off. In terms of next steps, I would suggest two additional analyses. First off, I would definitely feel more confident in the decision if we had an opportunity to analyze price sensitivity further.

We analyzed three different price points and saw their impact on volume. Given this recommendation is so dependent on making sure that volume increase happens, I would feel a lot better if we could test multiple price points, tiered pricing, various combinations, to see how they would impact volume. So that is the first next step.

The second next step would be to better analyze and understand the life span of the technology. I think the first five years, there are some questions on whether the technology would be the most profitable, and it is very dependent on the volume. But after the five years, when that loan is paid off, the cost structure is definitively much more attractive than the current technology.

So if that technology lasts another 10 to 20 years, then over the long-term timeframe, I would say it is far more likely that this thing makes a lot of sense. If the technology only lasts five years, then you're really betting on making sure that quantity increase and that volume increase does happen in the first five years for that decision to make sense.

These last couple of paragraphs that I mentioned is what I call an "add on" to the standard close. I think it is something that is worth doing to get extra points, if you would, in your closing. What it is – it's an "open issues statement" that is added on to your standard close. You don't do it *instead* of your standard close, you still do the standard close and afterwards, you do this "add on" phrase. Basically what the "add on" phrase is: you identify the things that still make you uncomfortable about the conclusion you've just made, or the things that would improve the precision level or the accuracy or the confidence level of the recommendation you just made.

Again, the recommendation you make in a standard close is based on the available information. So what you answer in your "add on" close is: if you had any additional information, or if you had time to get additional information, what you would go get.

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This is a classic example of that, having to “add on” close. The key thing is to list the things you would consider, explain why they would be useful, and then to finish that off, just like I just did.

And from a practical standpoint, the reason this works, by the way, is because this is what partners do. The open issues – the question marks that still remain in your analysis – are the reasons why you justify having a second engagement with a client, or a follow on engagement, or Part 2, or the next phase. All these phrases are the phrases that— what happens is the associate and the engagement manager will say this in the presentation, and then behind closed doors, the partner will basically pitch them on, “You know those factors did make a lot of sense. Is this something you’re interested in pursuing, in getting greater clarity or certainty around these open issues?”

So partners especially like these “add on” things, because to them, these are excuses to have those sales conversations with clients to sell them more work. So when you notice these things and can point them out, it is something that is expected of a second- or third-year consultant. So when you use “add on” statements like this in addition to your standard close (not instead of), then what happens is: it seems like you’re a colleague, not a candidate, because you’re doing things only an advanced consultant would typically do. And if you don’t do it as a candidate, you probably can still get an offer, but when you *do* do it, it just sort of solidifies that you know what you’re doing. And the perception really is: “This person really clearly is a colleague that just happens to be in the recruiting process,” as opposed to: “They’re a candidate.”

Again, if you can do it— practice it, so that it’s very succinct and not long-winded. Again, you do it *after* your standard close, and add just a few more sentences to identify what else you would consider, and why you would consider looking at them.

Interviewer: Great, thank you. I appreciate your time, and thank you for helping out the client today.

**01:02:00**