DECODE and CONQUER

Answers to Product Management Interviews

LEWIS C. LIN

ALSO BY LEWIS C. LIN

Career

Be the Greatest Product Manager Ever

Interview Preparation

Case Interview Questions for Tech Companies

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Secrets of the Product Manager Interview

Negotiation

71 Brilliant Salary Negotiation Email Samples

This book is dedicated to my parents, sister, and wife. Thanks for supporting my passion for business and helping me push past my fears to embrace entrepreneurship.

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Introduction

Teaching is a passion of mine. With this book, I'm thrilled to share my knowledge of product management interviews. For nearly 10 years, I've helped job seekers land their dream jobs. During that period, I've taught clients the fundamentals of product management, design, business, technology, and face-to-face communication.

Over the years, clients have asked me for sample answers for case interview questions for the likes of Google, Amazon, Facebook, LinkedIn, and Microsoft. To my clients, you've inspired me to write this book. I hope you enjoy it.

This book focuses on sample answers. On the Internet, there is no shortage of tips and frameworks for how to answer these questions. But actual answers? That's rare. That's what you'll get here.

This book will help you understand why a question is asked and what distinguishes a good response from a bad response. I also provide advice on how to approach each question category.

Product management case interviews are tough. They combine interview questions from disparate disciplines, including project management, product design, software engineering, management consulting, and marketing.

The best way to prepare is to practice. This book will help you develop responses with the help of sample answers. You won't be caught off guard by unexpected interview questions. You will be able to analyze the differences in various responses and determine what's best for you. When the big interview day comes, with your newfound awareness and knowledge, your responses will be memorable and convincing.

The book isn't meant to give you a script to read from during an interview. Instead, the goal is to prepare you for whatever questions come your way. By working with this book, your responses will sound practiced, but not in the regurgitated way that interviewers can easily detect. This book will prepare you for any unique, employer-specific questions you may encounter.

For the sake of simplicity, I refer to hypothetical candidates as “he” and hypothetical interviewers as “she.”

There is no substitute for true, in-depth knowledge. That is the product manager’s burden. You must be an expert across many different fields. Over time, if you haven’t already, you should develop an intellectual curiosity for all product management disciplines – from design to business to technical. You’ll find that interview responses will come more naturally.

Your delivery is as important as what you say. Good product management candidates give answers that are impactful, influential, engaging, and precise. Ineffective candidates ramble at the same cadence as dull corporate jargon. It’s important to be crisp in your responses and avoid boring answers.

Good luck with your interviews. By challenging yourself and practicing, you won’t need it!

Lewis C. Lin

Chapter 1 Critiquing Design

Any good design critique includes a scorecard. It's an objective way to determine if a product passes or fails based on predetermined criteria.

Dieter Rams is a famous industrial designer who deeply influenced Apple's former design chief, Jony Ive. Rams has 10 design principles that govern his work. These principles serve as a starting point when evaluating a product or feature design.

Ten Principles of Good Design by Dieter Rams

Good design is:

1. **Innovative**
2. **Makes a product useful**
3. Aesthetic
4. **Understandable**
5. Unobtrusive
6. **Honest**
7. Long-lasting
8. Thorough down to the last detail
9. Environmentally friendly
10. As little design as possible

Of his 10 design principles, I've bolded the best ones to cite: innovative, useful, understandable, and honest.

Approach any product design critique by:

1. Revealing your design criteria, capping them at three.
2. Explaining how the product may or may not meet your criteria.
3. Offering specific evidence and contrasting with similar products.

Practice Questions

1. Do you like LinkedIn's endorsement feature?

2. Tell me about a product you like and use frequently. Why do you like it?
3. Tell me about a product that was designed poorly.

Answers

Do you like LinkedIn's endorsement feature?

CANDIDATE: When I evaluate whether I like a feature, I think about three design principles:

- Is it innovative?
- Is it useful?
- Is it honest?

I'll use those principles to evaluate LinkedIn's endorsement feature.

Since I don't recall the feature details, I will start by reviewing where the feature appears and how it works. The endorsement feature appears on different parts of the site.

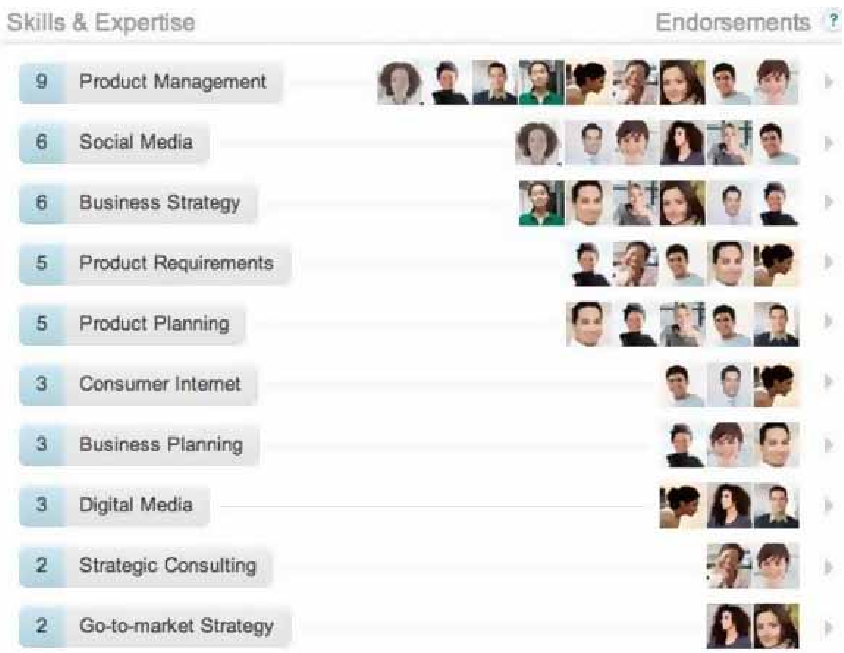
On your profile page

There's a pop-up at the top of the page asking you to endorse the skills of four people you know.

LinkedIn offers suggestions for endorsements. You can endorse each person individually, or you can easily endorse everyone by clicking a single button.

On someone else's profile page

There are suggestions for that person alone, not four different people. There are a few suggestions — with the ability to add or subtract endorsements. If the individual accepts them, suggested endorsements could be added to that person's profile with a single click of the yellow "Endorse" button.



All endorsements appear at the bottom of a user's profile page. On the left is the number of people who endorsed a skill. On the right are photos of those who gave the endorsement.

	Pros	Cons
Innovative	Is a clever way to get more profile data	May not produce quality data
Useful	Adds more information about the individual Identifies probable expertise areas	Has categories that don't include details or examples
Honest	Provides wisdom of the crowds	Lacks way to verify what is true

The feature is innovative despite its problems. It's a clever way to get more profile data with an easy one-click process. And the endorsee will feel compelled to return the favor to the endorser, creating a growing cycle of more endorsement data.

But the data quality is suspect. On one hand, LinkedIn doesn't allow strangers to endorse one another. But on the other hand, who knows if the endorser is qualified to evaluate a person's expertise?

The feature meets my usefulness criteria. LinkedIn wants people to find the site valuable and worth spending time on. Users are more likely to spend time on it if there's more data to peruse. The data also has two additional benefits to LinkedIn. First, LinkedIn can create new products based on rich data. Second, for a competitor to lure the LinkedIn user, it would take a lot of time to re-create all the value that already exists on LinkedIn.

The downside is that these endorsements don't include examples or details of a person's expertise. For example, if someone is endorsed as a web design expert, I'd like to see a link to his or her design portfolio.

The third and final criterion for me: is this feature honest? I have mixed feelings about that. On one hand, it leverages the wisdom of the crowds. On the other hand, there's heavy sampling bias. Friends are more likely to endorse each other than people with other types of, or no, relationships. Also, endorsed users might feel pressured to return the favor, possibly upvoting connections that shouldn't have been upvoted in the first place.

Key Takeaways

Establish your criteria upfront. It sets your interviewer's expectations. It also serves as an effective roadmap for the conversation.

Walk the user through the feature. This may seem unnecessary. However, most candidates overestimate their product knowledge. They assume they know how it works, only to be challenged by the interviewer later when the feature doesn't work that way. By methodically walking through the product before critiquing it, the candidate takes the opportunity to be on the same page as the interviewer before moving forward.

Tell me about a product you like and use frequently. Why do you like it?

CANDIDATE: My favorite product is my iPhone. When I think about why it's my favorite, it comes down to three key design questions:

- How useful is it?
- How innovative is it?
- Is it easy to use and understand?

In terms of utility, there's no other device that I use as much as my iPhone. It's a personal communication device that allows me to browse the web and listen to music. Excluding eating and breathing, it meets or helps meet most of my life needs, including getting stuff done and connecting with friends and family.

It's a very innovative product. Before the iPhone, the BlackBerry dominated. BlackBerries were effective for email, but they were ineffective when browsing the web. And there were few apps. Remember checking sports scores on a WAP-enabled (wireless application protocol) ESPN site? It seems archaic compared with what we have now. We've come a long way, and the iPhone gets most of the credit for starting the revolution.

Finally, the product is easy to use and understand. There are few buttons — just the ones that are critical and obvious: on/off, ringer mute, and volume controls. Perhaps the only non-obvious button is the home button, but fortunately, that button is easy to figure out.

Navigation is simple. Just use your finger. And it fits cleanly with pre-existing mental models. You scroll through pictures as if you're flipping through a photo album.

To recap, I like the iPhone because it meets my three criteria for great products. It’s useful, innovative, and easy to understand.

Key Takeaways

Use evidence. Always justify your assertions.

Details matter. Vivid language, such as the names of people, makes your response more credible and memorable.

Tell me about a product that was designed poorly.

CANDIDATE: When I think about a product that was designed poorly, I think of Apple's hockey-puck mouse from the iMac. There are three reasons:

First, it didn't work well. The round shape made it hard to orient. Without looking at the mouse, you couldn't tell if you were holding it right side up, upside down, or sideways. The mouse could have used some tactile cues to help you determine its orientation.

Second, the design was excessive. The blue accents on the left and right did not deliver additional function. They could be misconstrued for buttons.

Third, the round shape was unique but not useful. Holding the mouse was just awkward.

Key Takeaways

Choose unique products. Make your responses stand out by choosing a unique product. Avoid commonly mentioned products.

Be sensitive. Criticizing an Apple product might be appropriate at many companies. But it might not be appropriate at the company that designed it. Use discretion.

Chapter 2 Designing a Desktop Application

Product design questions are some of the most dreaded questions in the product management interview. Candidates tend to stumble in four areas when it comes to the product design interview.

Reasons Candidates Stumble

Starting. I can't tell you how many times I get that "Oh, no!" deer-in-the-headlights look.

Rambling. The candidate doesn't have a clue how to answer. He tries to improvise a solution as he is talking. It's painful for the listener.

Ending the response. Candidates find it uncomfortable to stop, unsure if the interviewer is satisfied with their answer.

Focusing on the solution only. Giving a solution without the appropriate customer context begs the question, "Why?" The listener doesn't know who the intended customer is or what problem the product solves. And it's not clear why this is the best solution, relative to other possibilities.

I created the CIRCLES Method™ to answer any design question. Use it for questions on how to design a new desktop, website, or mobile application. You can even use it to design new consumer products like a car, camera, or can opener.

The CIRCLES Method™ is a guideline for what makes a complete, thoughtful response to any design question. It's a memory aid that prevents us from forgetting a step in the answer.

In case you forget, remember that designers love circles. Therefore, the CIRCLES Method™ is perfect for design questions.

What Is the CIRCLES Method™?

C omprehend the Situation

I dentify the Customer

R eport the Customer's Needs

C ut, Through Prioritization

L ist Solutions

E valuate Trade-offs

S ummarize Your Recommendation

Comprehend the Situation

Keep three parts in mind when comprehending the situation:

- Context
- Goals and Metrics
- Constraints and Assumptions

Context

Not too long ago, I asked a candidate, "Pretend you are a Windows product manager. How would you improve it?" I stopped him 45 seconds into his response. He was rambling and using nonsense phrases like "Windows deepens customer empowerment."

I asked him, "Have you used Windows?" He sheepishly replied, "Never. I use a MacBook."

Sigh. If you don't know the product, speak up. It's not fair for you to have to discuss a product you don't know. It's like trying to perform open-heart surgery without knowing what a heart looks like.

You're entitled to ask the interviewer clarifying questions. What can or should you ask the interviewer?

Here's a list:

- **What is it?**
- **Who is it for?**
- **Why do they need it?**
- When is it available?
- Where is it available?
- **How does it work?**

This list of questions is frequently called the "5 W's and H." To save time, the most critical questions are those in bold: what is it, who is it for, why do they need it, and how does it work? We'll call it the "3 W's and H."

If the interviewer refuses to answer your clarifying questions, assume based on what you know. Then, allow the interviewer an opportunity to correct you; she may think differently about who it is for or how the product works.

I also recommend that you pull up the website, mobile app, or application. A visual improves communication. And who knows, since we live in a world of rapid experimentation, the website you saw yesterday may have changed today. Or if you're talking about a product that the interviewer is working on, she may use a beta version internally, which differs from the public version you use. Avoid miscommunication; don't assume that you and the interviewer have the same mental model.

Goals and Metrics

Focus the discussion by clarifying the goals or metrics. Here's a checklist of possible goals:

- Revenue
- User acquisition
- User retention
- Market share
- Customer satisfaction
- Conversion rate
- Basket size

Constraints and Assumptions

There's an infamous interview question where an interviewer says, "Design a new airport." Most candidates dive into the question, describing an elaborate airport filled with runways, terminals, and mouth-watering food courts. Toward the end of the response, the interviewer deadpans, "You forgot to ask how much land you have for the airport. In this case, you only have enough land to fit a few helipads."

Don't make the same mistake. Inquire about constraints and other important assumptions. Here are some common ones:

- **Deadlines**. When do we have to achieve our goal?
- **Resources**. How much money, engineers, and other resources do we have to achieve the goal?
- **Scalability**. How many visitors are we expecting? What's the distribution of read vs. write operations? What kind of write operations are we expecting? Is it lightweight like text updates, or is it substantial like a video upload?
- **Platform**. Is it for web, iOS, or other?
- **Geography**. Which country or region is it for? Are there technology constraints such as limited device penetration or slow, inconsistent Internet access? Are there regulatory constraints?

Identify the Customer

Start the second step of the CIRCLES Method™ by listing potential customer personas. Here are some examples:

- Food lovers
- Soccer moms
- College students
- Small business owners

Time is limited, so focus on one. Your interviewer expects amazing, not mediocre, product ideas. Focusing on a single persona not only saves time but also prevents you from proposing a magical, all-in-one device that does everything for everyone. Often, all-in-ones aren't good or credible.

The interviewer may not be familiar with your chosen persona; help her comprehend whom you are talking about. A 2 x 2 matrix is a powerful way to visualize it.

Kat, the traveling reader

Behaviors

- Goes on vacations with books
- Travels four times a year
- Carries four books per trip

Demographics

- 55-year-old, single female
- Lives in Hoquiam, Washington
- Income: $70,000 USD

Needs and Goals

- Discover new books
- Discuss books with others
- Write a book one day

Photo credit: Joe Crawford

Report the Customer's Needs

The third step of the CIRCLES Method™ is reporting the customer's needs. You can also call them user needs, user requirements, use cases, user stories, or pain points. In modern product development, the user story format is a popular way to capture user needs. A user story conveys what the end user wants to do in everyday language, but it does not describe how the solution works. Here's the user story template:

As a <role>, I want <goal/desire> so that <benefit>.

Here are two examples based on our persona, Kat, our traveling reader:

Discover new books

As a traveling reader, I want to get recommendations so that I read books that are either well-written or good examples of my favorite genres.

Write a book

As a traveling reader, I want to write 500 words a day so that I can publish my memoir.

User stories have become popular because they are concise, complete, and casual. In a single sentence, we understand the user, his or her needs, and the intended benefit.

Cut, Through Prioritization

Looking at our "discover new books" and "write a book" user stories above, they each scream for a different solution. During the interview, you don't have time to talk through all use cases. Just pick one.

Hence, step four of the CIRCLES Method™ is to cut, through prioritization. Your decision is an opportunity to showcase your ability to prioritize, assess trade-offs, and make decisions.

This prioritization step mimics the real-world development process. You'll have a big backlog of user stories, but you're limited by time, money, and labor. Which one do you do first?

User Story	Revenue	Customer Satisfaction	Ease of Implementation	Overall
Write a book	A	A	A	A
Discover new books	C	C	C	C

The prioritization matrix above helps product managers think about priorities in a structured way.

Real-world prioritization is not that different from the matrix above. That is, it's based on subjective criteria, weights, and grades. We accept subjectivity because it's better to have an imperfect process than no process at all.

A prioritization matrix forces the decision maker to think and articulate what's important. Is revenue more important? Or customer satisfaction? Ultimately, the true arbiter of go vs. no-go for a new feature should be an A/B test.

You're welcome to augment any prioritization matrix with additional criteria such as:

- Strategic importance
- Probability of success
- Work-around availability

If you're looking for a more memorable framework, Intercom's RICE method has a catchy acronym. RICE has four prioritization criteria:

- **R**each. How many people will be impacted?
- **I**mpact. What's the benefit of that user story from low to high?
- **C**onfidence. What's the probability of success?

- **E**ffort. How much time will it take?

Calculate the RICE score by using this formula:

$$\frac{Reach * Impact * Confidence}{Effort} = RICE\ score$$

Let's revisit our user stories using the RICE framework:

User Story	Reach	Impact	Confidence	Effort	RICE Score
Write a book	100,000 people	8 out of 10	50%	8 months	50,000 units of impact per month of effort
Discover new books	20,000 people	2 out of 10	20%	2 months	4,000 units of impact per month of effort

If you're looking for a more revenue-focused approach to prioritization, estimate the revenue impact and investment, measured in engineering effort. "Story size" is a metric to estimate the engineering effort necessary to complete a story. Then calculate an ROI-like metric, which I call revenue per point of effort.

User Story	Revenue impact	Story size	Revenue per point of effort	Priority
Write a book	$500,000	8	$62,500	1
Discover new books	$20,000	2	$10,000	2

Ultimately, every prioritization matrix or scorecard is based on ROI. That is, how much benefit do you get per unit of investment? There's no need to agonize over which is best. Pick one. The most important thing is to have a thoughtful way to justify your priorities.

List Solutions

Step five of the CIRCLES Method™ is to list solutions. Most candidates freeze when they don't have solutions in hand. Overcome the designer's block by using brainstorming frameworks. Here are my three favorites:

Reversal method. Reversing the situation helps uncover new possibilities.

Example: Create a new-car-buying experience.

Need: Buyers don't have time to travel to the car dealership.

Solution based on reversal: Dealership can deliver test drives to the buyer's home.

Attribute method. List all the product attributes. Mix and match to get interesting new combinations.

Example: Design a new laundry hamper.

Material	Shape	Finish	Position
Wicker	Square	***Natural***	Sits on the floor
Plastic	Cylinder	Painted	On the ceiling
Paper	***Rectangle***	Clear	On the wall
Metal	Hexagon	Luminous	Basement chute
Net material	Cube	Neon	***On the door***

Here's a solution based on the attributes above: I suggest we build a ***rectangular plastic*** hamper with a ***natural*** finish that can be mounted ***on the door***.

Why? Method. Challenge the status quo.

Example: Design a new coffee cup.

Start by challenging the status quo: Why should coffee cups have handles? Cups are too hot to hold directly.

Solution based on Why? Method: Create a coffee mug with an insulation layer.

I have two more tips when listing potential product solutions.

Tip #1: Think big

The typical candidate lists solutions that fall into one of two categories:

- *Me too ideas*. For example, "As the product manager for an ecommerce site, I would create a new feature that's similar to Amazon's product recommendation feature." Yawn.
- *Integration ideas*. For instance, "As the Google product manager, I would integrate YouTube with Android." Yawn.

Most employers are evaluating your creativity and vision. They're looking for product managers who can see future trends, both in technology and customer behavior. They expect those product managers to plot and execute plans that exploit those trends, for the company's benefit.

To help spur your thinking, consider the following big bets from tech industry leaders:

- In 2008, Google made a $4.6 billion bid for wireless spectrum. How did Google have the gravitas to make a multibillion-dollar bid when the company had no experience as a wireless operator? Google had guts. In the end, it was one of the biggest bluffs in business history. Google didn't win the bid, but they didn't want to. They got the FCC to adopt open-access rules that would force the winner to allow any Google device or application to connect to this new spectrum. That privilege was worth billions to Google. And they got it for free.
- That same year, Facebook launched Facebook Connect. Facebook encouraged developers to use Facebook as their sign-in service. Facebook positioned the feature as trustworthy and easy to use. Then developers could devote time that would have gone into building proprietary sign-up and sign-on systems for something else. And web and mobile applications would have access to a

> user's valuable Facebook data. But Facebook had the biggest win. Facebook Connect allowed Facebook to track user behavior around the web. They knew which websites a user visited and what mobile apps they used. They could use this data to build better products, and more importantly, deliver more targeted ads. Facebook makes billions from advertising. Better ad targeting can easily lead to a 500 percent increase in revenue.

Tip #2: Have at least 10 ideas

Great innovators know that the first idea is rarely the best. Why? Innovation is an iterative process. As you learn more about customer needs and competitive products, subsequent ideas will be more precise and focused. You'll also avoid ideas that have been tried and that failed.

At the interview, brainstorm at least 10 ideas. It's hard, but it'll be worth it. I've found that the first three ideas are usually unoriginal. As you push yourself, you'll find idea number seven or idea number 12 to be stirring and noteworthy.

If you come up with a large list of ideas, do not share them all. You don't have enough time. Just share the three most promising.

Evaluate Trade-offs

The sixth step of the CIRCLES Method™ is to evaluate the trade-offs of your top three solutions by discussing the pros and cons. If you'd like to be more organized and rigorous in your assessment, you can define trade-off criteria instead of pros and cons. Criteria could include customer satisfaction, implementation difficulty, and revenue potential.

By evaluating the trade-offs of each solution, you will come across as thoughtful and analytical. And you'll be perceived as objective.

You'll also protect yourself from being defensive. If you've taken the initiative to critique your solutions, the interviewer has fewer things to criticize. You'll also mentally prepare yourself for criticism by critiquing yourself.

Summarize Your Recommendation

The seventh step of the CIRCLES Method™ is to summarize your recommendation. This is an optional step; sometimes the interviewer is satisfied with a brainstorm and the pro and con analysis.

But others want to test your communication and decision-making skills. That is, can you present a 20- to 30-second summary of your product proposal? And can you make the hard decision to suggest just one solution?

Summarize with this four-step approach:

1. Tell the interviewer which product or feature you'd recommend.
2. Recap what it is and why it would be beneficial to the user and/or company.
3. Explain why you preferred this solution vs. others.
4. Note any next actions you'd take to explore this idea further.

Tip for Using the CIRCLES Method™

My clients often struggle with design questions because they're uncomfortable exploring customers' needs without a solution. If that's the case, it's okay to have a solution in mind and lead your CIRCLES Method™ discussion toward it.

It's important for you to exude confidence during the design discussion, and if this is what makes you feel better, fantastic. I also find that having a solution in mind can help constrain the realm of potential personas, needs, and solutions, which can improve the quality of your responses.

Eventually, I would love for you to embrace the great unknown and enjoy a design problem without having a solution in mind.

Practice Question

1. How would you improve Microsoft PowerPoint?

Answer

How would you improve Microsoft PowerPoint?

CANDIDATE: Here's how I would improve Microsoft PowerPoint:

The candidate writes the following on a whiteboard:

- *Goals and constraints*
- *User and use cases*
- *Prioritize use cases*
- *Brainstorm solutions*

CANDIDATE: First, I'd make sure I understand the goals and constraints; then, I'd explore the user and use cases; and last, I'd prioritize the use cases and focus on brainstorming solutions for the most urgent use case.

INTERVIEWER: Sounds good.

The candidate writes the following on a whiteboard:

- *Revenue*
- *Engagement*

CANDIDATE: We can consider different goals, such as increasing revenue and engagement. I have revenue in mind, but is there another goal that you prefer to discuss?

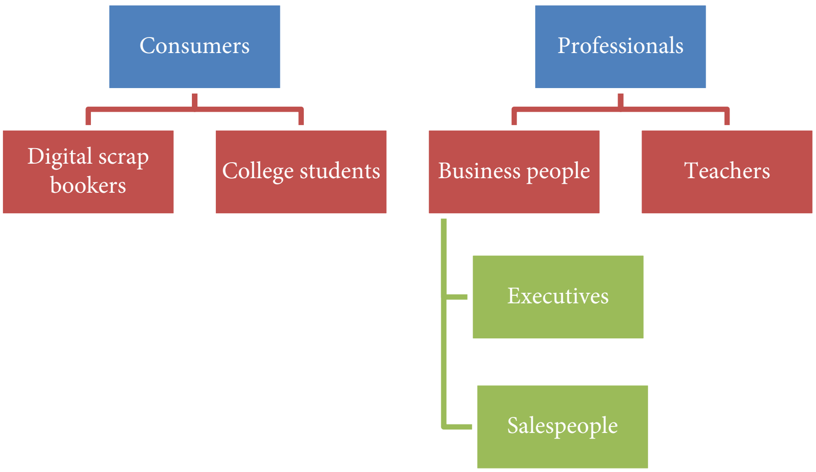
INTERVIEWER: I'd like you to focus on revenue.

CANDIDATE: Okay, let's focus on revenue. Is it fair to assume that we will increase revenue by selling a Microsoft PowerPoint add-on?

INTERVIEWER: Sure, this new product is going to be an add-on.

CANDIDATE: There are different personas we can consider. Just rattling a few off the top of my head…

The candidate draws the following on the whiteboard:



CANDIDATE: Which persona would you like to focus on?

INTERVIEWER: Salespeople.

CANDIDATE: Based on my understanding, salespeople use PowerPoint primarily for customer presentations. They want to win a business deal. When working on PowerPoint, here are the use cases that come to mind:

1. Need to figure out what to say
2. Need to figure out how to say it
3. Need to determine how to visually communicate that message

Of these different use cases, you can't solve the latter two without solving the first one. So, I feel the first one is most important. If you approve, I'll brainstorm solutions for that use case.

INTERVIEWER: Go ahead.

CANDIDATE: In response to the need to figure out what to say, there are a couple of ideas that come to mind:

- **Pitch Builder** would provide a guided process to build a pitch, using proven, compelling templates. There are salespeople who have the motivation to put together a good story, as long they can be guided through it. This is a concept first shared in *Switch* by Chip and Dan Heath.
- **Inspiration Gallery** would set up a gallery where individuals could submit their favorite, proven sales pitches. Contributors would establish their sales expertise and reputation by sharing proven pitches, and users would learn from others' best practices.
- **Expert Marketplace** would deliver a marketplace where users could find experts who could provide pitch-building advice.

INTERVIEWER: What's your recommendation?

CANDIDATE: Of these ideas, I prefer Pitch Builder. I believe in the power of templates, and a step-by-step story-building wizard is how professional presenters build effective PowerPoint presentations.

Key Takeaways

Show customer empathy. A big part of product sense is customer empathy. Some interviewers will ask you to explore customer needs deeply as a way of showcasing this skill.

Point out details. Product sense is also about noticing details that others miss. Use phrases like "here's where it gets interesting" or "here's an insight that most people miss" to underscore an important point.

Chapter 3 Designing a Webpage or Website

You can apply the same CIRCLES Method™ when asked to design a webpage or website.

Tip: Interview Visually

A product manager's job is to effectively communicate their ideas, and pictures often express ideas better than words.

Take this to heart. When critiquing a website or product, have visuals accessible and ready for display. When introducing an idea, be prepared to walk up to the whiteboard and sketch out wireframes. Standing up with a pen in hand, and leading an audience, even an audience of one, through a design critique or proposal appears authoritative. Hiring managers want product management candidates who radiate leadership.

If you want to impress an interviewer, redesign a webpage at home, using your favorite mockup tool, whether it's Balsamiq, Adobe Photoshop, or Microsoft PowerPoint. Bring copies of your visuals. At the beginning of the interview, subtly introduce your redesign. You can say, "When I was preparing for today's discussion, I couldn't help but redesign your profile page. (Share your visuals.) We can talk about my redesign during the interview if you'd like."

This tactic will absolutely melt hearts. It stands out. Few candidates take the initiative and effort to do this. Others don't do it because they're afraid. They're afraid the tactic is too unconventional, or they're afraid to commit their design ideas to paper.

Let's think about it. There's a strong likelihood the interviewer will ask you a design question. Do you want to come up with a half-baked solution at the interview? Or would you rather spend a Sunday thinking through several variations and polishing up something presentable on Photoshop?

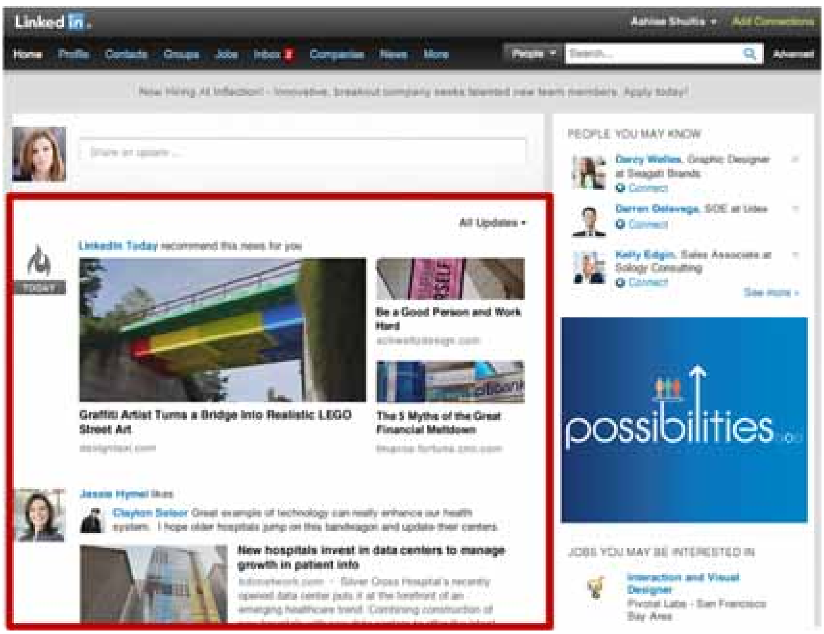
For your candidacy, moving on to the next round or getting a job offer is simply about two things: credibility and likability. Visually sharing your ideas portrays confidence in your design skills.

Practice Questions

1. How would you improve LinkedIn's home page?
2. How would you improve LinkedIn's sign-up process?
3. How would you improve Google's image search?
4. How would you improve restaurant search?
5. How would you improve Google Maps?

Answers

How would you improve LinkedIn's home page?



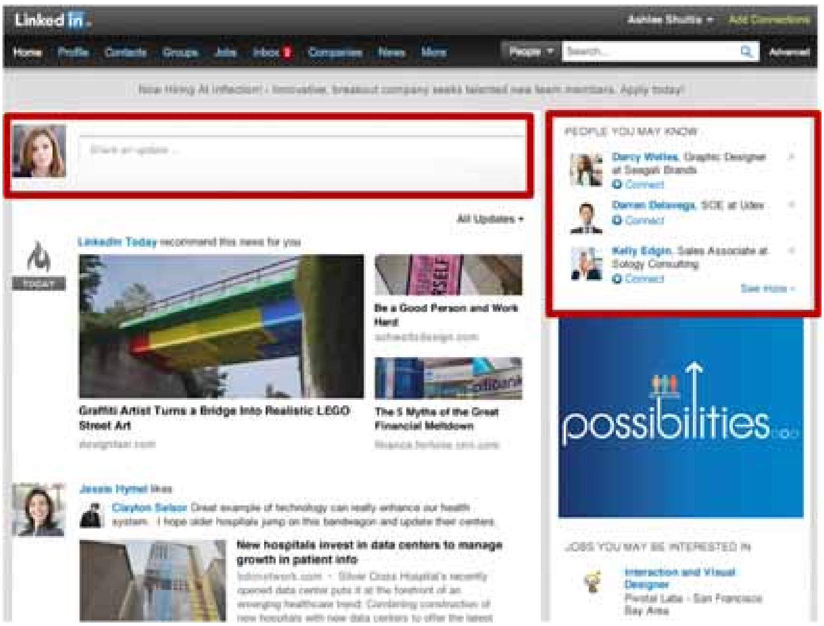
CANDIDATE: Before I make suggestions, I want to review the webpage, make sure I understand all the features, and ask clarifying questions.

INTERVIEWER: Sure.

CANDIDATE: My first thought: who is this page for? It's targeted to the LinkedIn user. My second thought: what does it do?

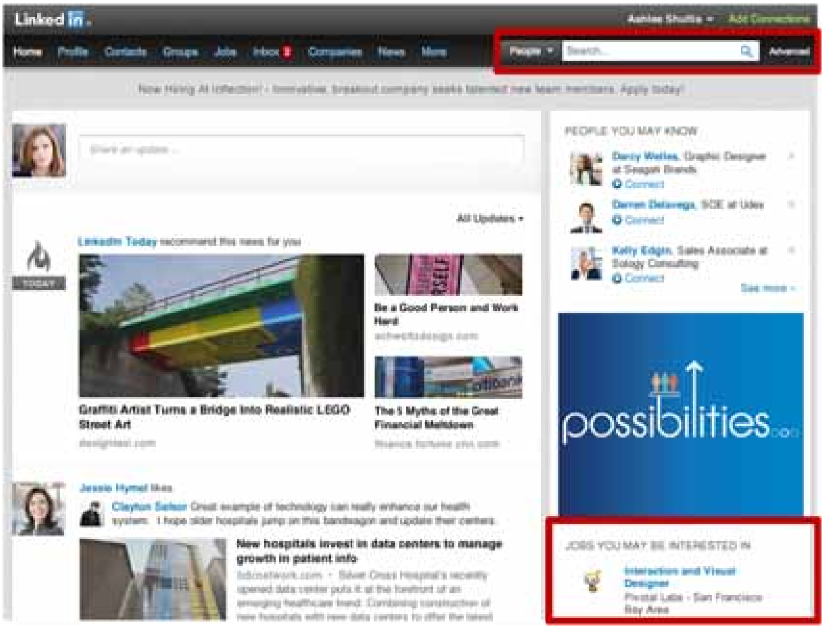
The candidate points to the big red box above.

CANDIDATE: I believe the primary goal is to show an evolving newsfeed. Here we see general news, but we could also get updates on our social network — whether someone got a new job, connected to other people, or received new skill endorsements.



The candidate points to the two red boxes above.

CANDIDATE: The secondary goal is to allow the user to post updates and discover new connections.



The candidate points to the two red boxes above.

CANDIDATE: The third goal is to search for people and identify new jobs. To summarize, there are four things one can do on this page:

1. Read updates for the work world, including general news and social updates.
2. Write updates.
3. Discover new contacts.
4. Identify new job opportunities.

Now that I'm more familiar with the home page, let's dive into the question. My first thought: what's the purpose of the redesign? I'm specifically thinking of business objectives such as increasing ad revenue, LinkedIn connections, or 30-day actives. I define 30-day actives as the number of LinkedIn users who have visited the site in the last 30 days.

I'd propose trying to increase 30-day actives, but I'm open to other suggestions too.

INTERVIEWER: No. Let's focus on engagement.

CANDIDATE: Next, I want to have a customer in mind for the redesign. Here are four personas that come to my mind:

- *The newsreader*. Officially, this persona is discovering new content to help them with their job. Unofficially, they are wasting time or procrastinating.
- *The social networker*. This person is keeping tabs on business relationships, hoping that it'll help him climb up the career ladder.
- *The job seeker*. Some will be unemployed. Others will be employed but striving to upgrade.
- *The salesperson*. Salespeople love LinkedIn because it is a treasure trove of contact information, interests, and needs. It's a great way to find new opportunities.

INTERVIEWER: Okay, we're short on time. Which persona do you want to focus on?

CANDIDATE: I'd like to focus on the salesperson.

INTERVIEWER: Go on.

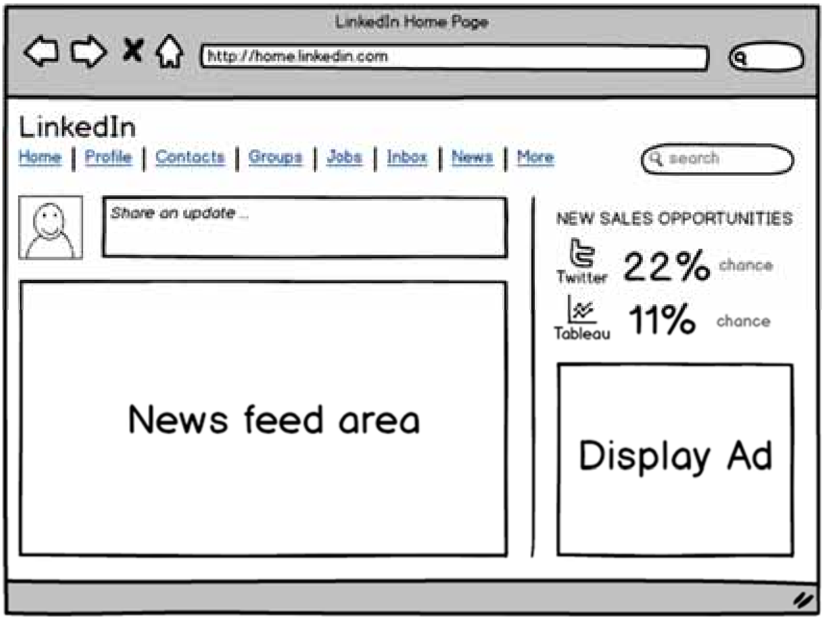
CANDIDATE: What are the top use cases for salespeople? Here are the first three I thought of:

1. They're looking for new customer opportunities.
2. They want to strengthen relationships with existing customers. Most salespeople strengthen relationships by offering value: solving customer problems, providing information that moves

their customers' businesses forward, and yes, even providing perks like tickets to a customer's favorite sports team.

3. They want to get inspired. Selling products is tough. Salespeople get rejected all the time. Inspirational stories and words of encouragement help them soldier on.

In my opinion, the most important use case is finding new customer opportunities.



Let me share with you a mockup of what I envision.

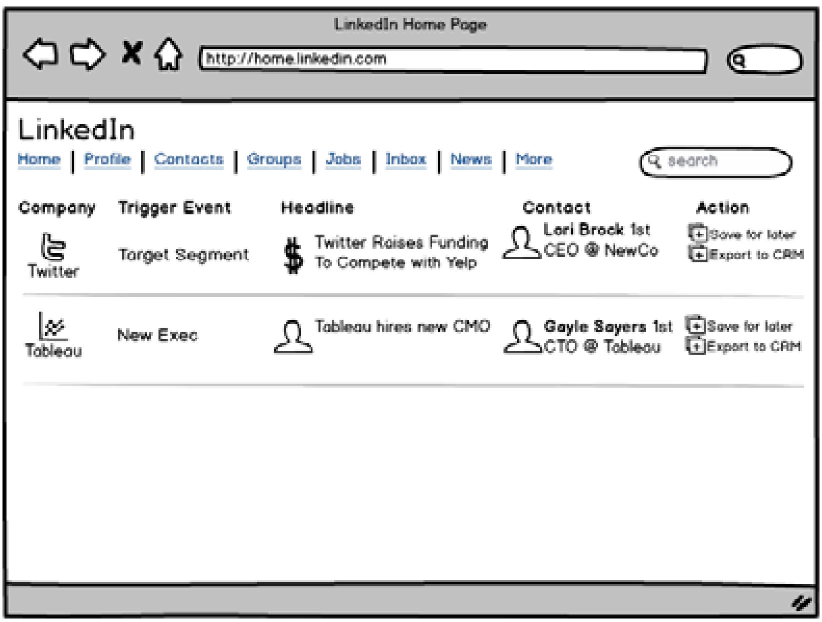
The candidate points to and discusses parts of the diagram.

CANDIDATE: It's your standard LinkedIn newsfeed: logo, navigation, search box, newsfeed area, and display ad. Here's what's different: the "new sales opportunities" section in the upper right.

As the title describes, this feature proactively identifies new sales opportunities for the customer. For example, there are two new opportunities, one for Twitter and one for Tableau Software, a company that helps users display data publicly in attractive ways. Sales opportunities with Twitter and Tableau have a 22 percent and an 11 percent chance to close, respectively. These predictions come from our algorithm, which analyzes sales opportunities based on a news event, similarities with existing customers, and the number of close connections to that company.

Clicking on "new sales opportunities," you'll see the next page, the "sales opportunity dashboard."

The candidate points to the next page, the sales opportunity dashboard.



CANDIDATE: On the sales opportunity dashboard, the salesperson can get more details including:

- *Trigger event*. For the Twitter sales opportunity, the dashboard indicates that it's in the same "target segment" as one of our existing customers. Competitive companies usually have similar needs. They're also easier to close because of the powerful sales intro, "I'm calling because one of your competitors uses our software…"
- *Headline*. This is the news that triggered the event.
- *Contact*. This identifies a potential contact person, with the ability to click to see their LinkedIn profile.
- *Action*. This allows users to bookmark a sales opportunity and/or export it to their customer relationship management (CRM) software. As a future addition, perhaps LinkedIn could become the forum through which contact is made. For instance, there could be cold call email templates, progress tracking, automatic follow-up, and reporting.

Key Takeaways

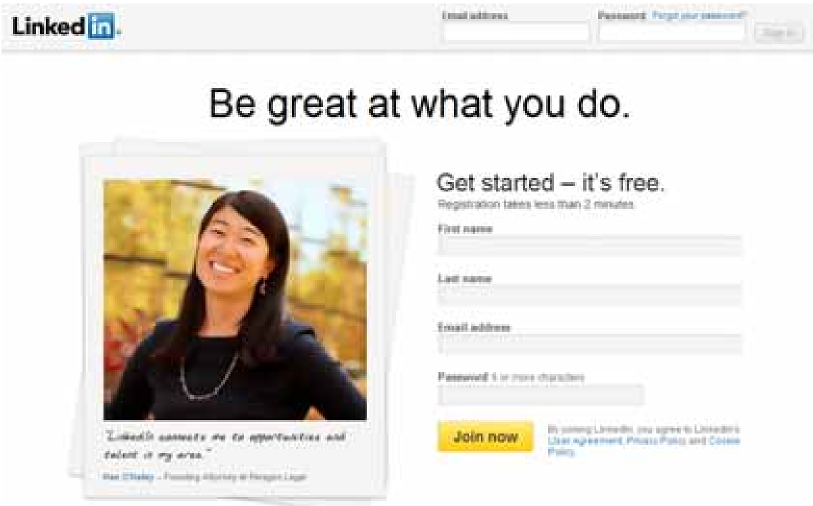
Interview visually. Practice drawing user interfaces, especially if it's not natural to you. Look up common design patterns so you don't have to re-create standardized user interfaces from scratch.

Unleash your creativity with a specific persona. Avoid generic personas, which will make it harder to home in on interesting and meaningful use cases.

How would you improve LinkedIn's sign-up process?

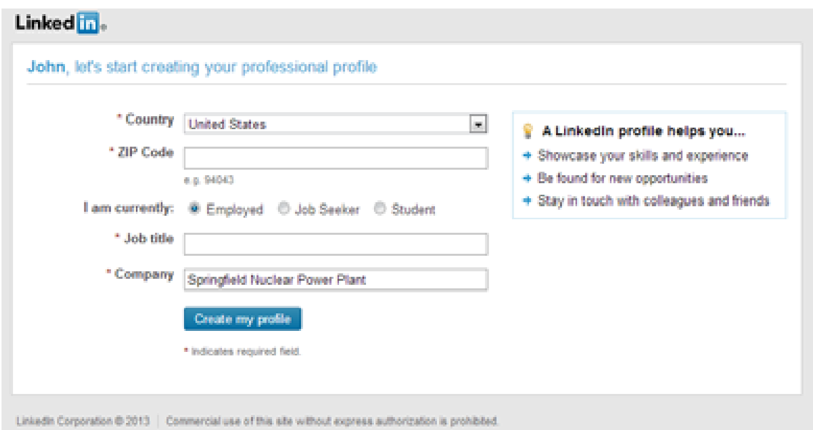
CANDIDATE: There are many pages in LinkedIn's sign-up flow. To make it manageable, I'm just going to go through it one page at a time and discuss the pros, cons, and recommendations for each page.

INTERVIEWER: Sounds good.



CANDIDATE: Here's what I like about the page. The testimonial validates the service, and the picture makes the service seem friendly. There's a single call-to-action, "Join now," with a simple registration process.

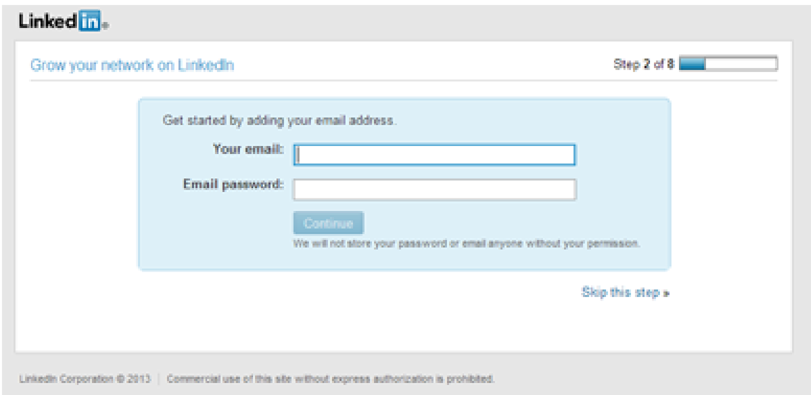
The one thing I hate about this page is the headline. The phrase "Be great at what you do" does not tell me what I'm signing up for. I'd recommend that we A/B test better headlines that describe what the product does.



The copy on this page is much clearer than that on the previous page. The headline tells you that you're going to create a professional profile.

The radio buttons in the middle naturally separate the first two fields and the last two fields. I would prefer the Job title and Company fields on top rather than Country and ZIP Code. It would seem like a more natural progression to the user.

I don't like that there's no indicator to show how many steps are left. Last, "e.g. 94043" under the ZIP Code field is visually awkward. I'd prefer it if "94043" was the default text in that field, just as "Springfield Nuclear Power Plant" is the default text for the Company field.



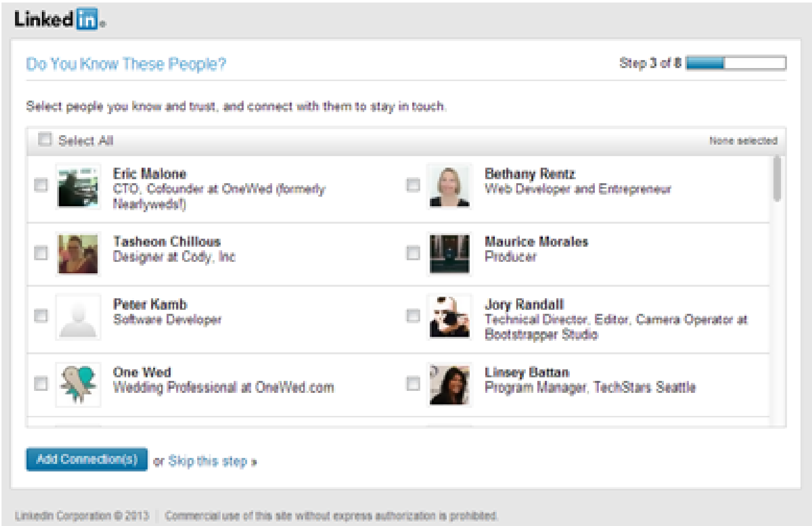
Here the page copy regresses. "Grow your network on LinkedIn" is an ambiguous headline. Additionally, the page doesn't explain why it needs my email address and password.

From personal experience using LinkedIn, I do know that LinkedIn wants to help me add people to my network. One way they help me grow my network is by importing contacts from my email application, checking whether they're already on LinkedIn, and suggesting connections.

I would recommend testing explanatory text such as, "We make it easy to find colleagues on LinkedIn. Enter your email address and password, and we'll check whether they're already on the site."

Despite the poor wording, it is a clever, easy, and fast tactic for growing a new user's network. I'll bet that users with more connections perceive LinkedIn to be more valuable and use the site more.

As a minor aside, it is good to see that the progress bar is now present.

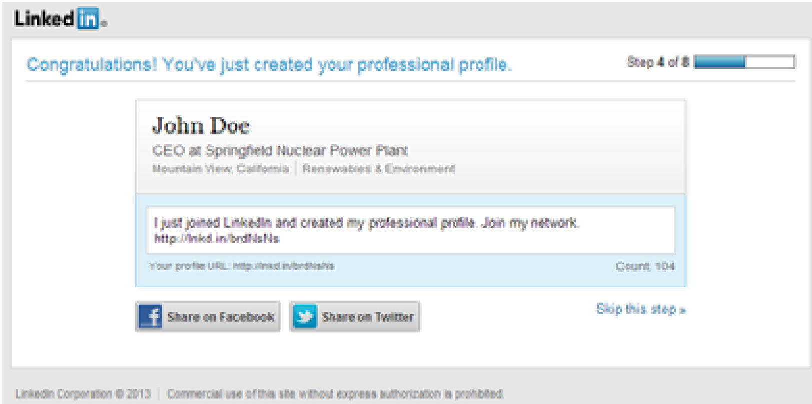


On this screen, LinkedIn suggests people to add to my network. That's helpful but creepy.

How does LinkedIn (correctly) know that these people are related to me? As a user, the connection isn't quite clear. I've only submitted basic registration information: title name, country, and zip code. How could it deduce that these people work with me, given that none of us work at the same company?

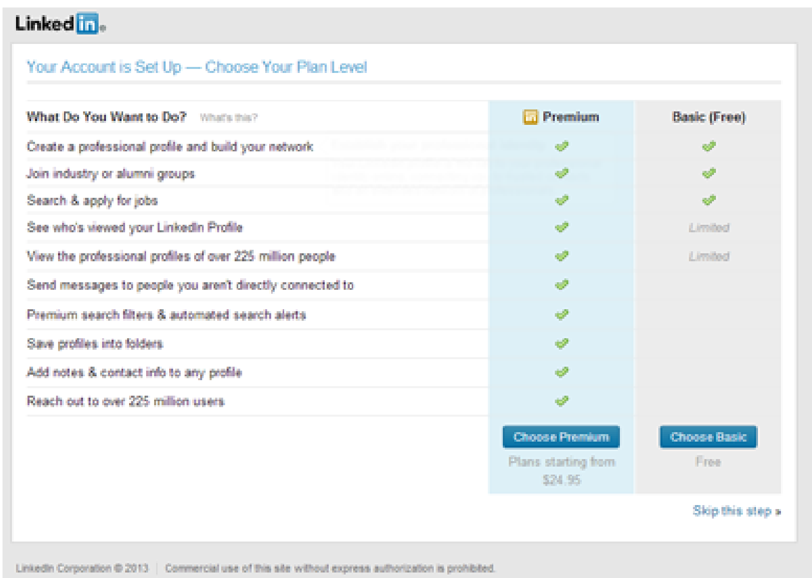
I guess that they suggested these people because we log in to LinkedIn using the same IP address. That makes sense since we all work in the same co-working space.

Still, I'm worried. I would recommend that LinkedIn explain how they generated these suggestions.



This screen is solid. I see a glimpse of what my LinkedIn profile will look like.

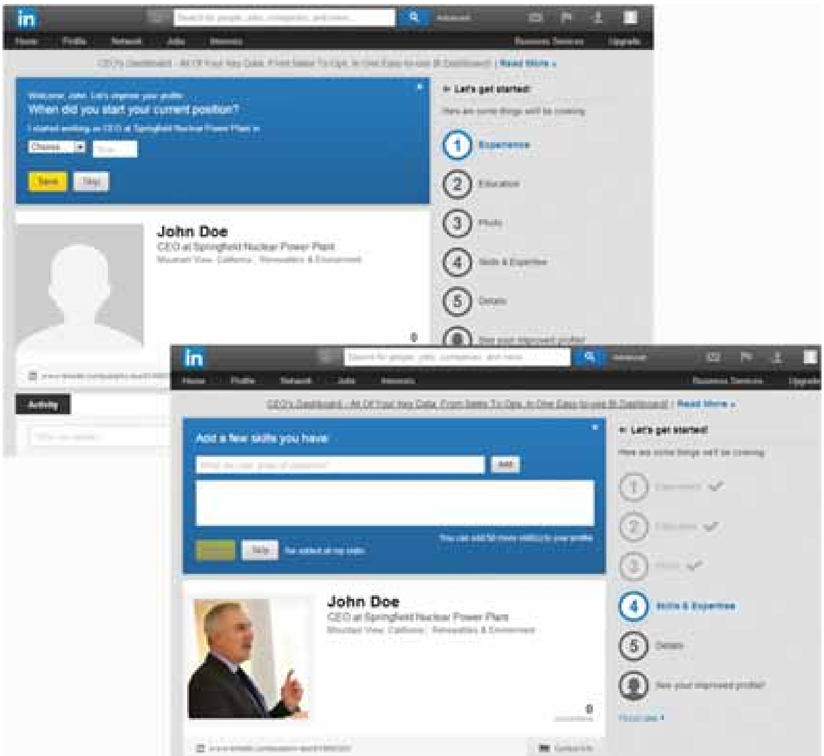
However, it asks me to share a message to my Facebook and Twitter networks. Why do they want me to share? Explain why doing so would benefit me.



This is a nice, detailed description of LinkedIn. It's much better than the front page with its headline: "Be great at what you do."

Visually, the tabular comparison makes it easy to see what I get and don't get in the premium and free accounts.

However, upsell feels premature. I just signed up for the service. How do I know if the free service is insufficient? The pricing is greyed out, which could be perceived as underhanded.



The final page I'll cover in my analysis is the profile page. I like that the blue box calls my attention. It's aligned with LinkedIn's desire to get me to add more data. The progress bar on the right shows how many actions remain. As I add information, my profile automatically updates. I like that. For example, when I added my picture, it automatically replaced the stock silhouette image with my picture.

The "finish later" option is a nice touch — just in case I'm fatigued from filling out forms.

Key Takeaway

Adapt your approach. Don't force frameworks. In this case, the candidate did not use the CIRCLES™ framework, and the interviewer is okay with that.

How would you improve Google's image search?

CANDIDATE: Before I begin, is the goal to improve usage and customer satisfaction?

INTERVIEWER: Yes.

CANDIDATE: Are there any metrics or timeframes that I need to keep in mind?

INTERVIEWER: No.

CANDIDATE: All right, when I think of image search, the first theme I think about is identification. I can think of a lot of personas who could benefit from image search including:

- Shoppers who want to buy products they see at a friend's house.
- Artists who need to identify a font or color.
- Architects who need help classifying a building style.
- Consignment store owners who need to determine the value of secondhand goods.

The persona that intrigues me the most is the secondhand goods seller. I watch "Pawn Stars," a reality TV show based on a Las Vegas pawnshop. I've also thought about starting a business in the consignment area.

INTERVIEWER: Okay, continue.

CANDIDATE: The two most critical activities in a pawnshop business are buying and selling products. Buying products that are fake, have low demand, or cost too much are the main reasons pawnshops fail.

I propose a new image search feature that meets the needs of the pawnshop owner. Here are the top three use cases I have in mind:

1. *Identification*. By taking a picture of an object, the image search engine would quickly and probabilistically identify it. For example, if the item was a watch, the image search engine would determine that through the shape, color, features, and brand. It would narrow the universe of potential watches from tens of thousands to possibly 20-30 watches. This would help pawnshop owners save time and minimize errors when identifying products.
2. *Authentication*. Customers often try to pass off fake goods as the real thing, which hurts the pawnshop. Our image search engine could help with the authentication process. One idea is to offer a comprehensive feature checklist for evaluating a new purchase. For example, all Chanel bags have authenticity cards and quilting that always lines up. Another idea is to have an authenticity lookup, especially for manufacturers that assign unique serial numbers to products. Last, we could create a marketplace where pawnshop owners could get a crowd-sourced appraisal through Google's video conferencing technology.
3. *Valuation*. I propose that Google partner with eBay to get data on secondhand purchases. From there, Google could propose valuation ranges for a product, based on the product's condition. The ranges would help determine purchase price minimums and sell price maximums. For example, if a Chanel handbag has never sold for less than $300 on the used market, the pawnshop owner can buy that handbag, with confidence, for $150.

Key Takeaway

Explain your solutions. When providing solutions, many candidates blurt out a one-liner like "build a recommendation engine." A one-liner, light on details, is unsatisfying. Don't be surprised if the interviewer follows up by asking how your solution would work.

How would you improve restaurant search?

CANDIDATE: Before we begin, I have a few clarifying questions. When you say "restaurant search," I assume you're referring to finding restaurants in the Google search engine. This is specifically about recommendations, not necessarily finding a specific restaurant, right?

INTERVIEWER: Correct.

CANDIDATE: Before we start our discussion, I want to make sure I understand our objective. I imagine we want to improve customer satisfaction around restaurant recommendations. We're not considering increasing revenue or page views or any other goals, right?

INTERVIEWER: Bingo. We're focusing on user experience.

CANDIDATE: Perfect, give me a minute to collect my thoughts.

I see several potential target users. Here are a few that come to mind: first, some out-of-town travelers want to book restaurant reservations weeks in advance. Second, there's a person who wants restaurant recommendations for a group dinner. Third, there are working couples too tired to cook and in need of a quick bite.

We don't have time to focus on all the personas; is there a specific one you'd like me to focus on?

INTERVIEWER: Yes, I'd like you to focus on couples.

CANDIDATE: Okay, we'll focus on working couples and talk about them in more detail. For working couples, it's usually a spur-of-the-moment decision. If they weren't so tired, they would have cooked at home and might have been cost-conscious with their food choices. The working couples we focus on are young professionals, so food quality is important to them. They won't settle for McDonald's. They want food that is as tasty as what they would have cooked at home. They're tired, so they don't want to travel far.

To summarize, their criteria in this scenario is:

- Quality
- Time to eat
- Price

Let's prioritize our feature requests with the matrix below.

User Story	Customer Wow	Reasonable Alternatives	Implementation Difficulty	Overall
Quality indicator	Not impressed	Yes	Low	Lower priority
Time-to-eat indicator	Impressed	No	Med	Top priority
Price indicator	Not impressed	Yes	Low	Lower priority

INTERVIEWER: I like your prioritization matrix. Why don't you tell me how you would implement a time-to-eat indicator?

CANDIDATE: For the time-to-eat indicator, let's brainstorm some alternatives. Time to eat is dependent on three factors:

1. **Agreement**. How much time do they need to agree on a restaurant?
2. **Travel**. How long does it take to travel to the restaurant?
3. **Food wait**. How long do they have to wait after ordering?

Google Maps has travel time information. Partner agreement can be factored in, too. Food wait seems to be the hardest to implement and intellectually interesting, so let's talk about that.

INTERVIEWER: Sounds good.

CANDIDATE: There are a few ways we could estimate food wait times:

- Have a restaurant provide estimates.
- Have restaurant-goers provide estimates.
- Get wait time data from a third-party information source.

There could be a conflict of interest if restaurants provide food wait times, and as far as I know, there are no third parties that provide wait time data.

There are several ways restaurant-goers can help us estimate wait times:

a. They could self-report via a survey or an extra field on a restaurant review. Self-reporting, though helpful, may not be accurate.
b. They could log the start and end times of their meal. This is better, but we would have to assume when the first appetizer or entrée arrived.
c. Last, restaurant-goers could check in on the mobile app when they get to the restaurant and then take a picture of the first dish they receive.

INTERVIEWER: Which one would you recommend?

CANDIDATE: Of the suggestions here, the last option is my favorite. It's the most accurate, and it leverages a habit – checking in and taking photos – that's common to food lovers today. There's no retraining needed.

Key Takeaway

Use tables. Listeners are screaming for organized, digestible information. Don't burden them with a jumble of words. Use tables instead. They effectively convey details in an organized way, minimizing the listener's cognitive load.

How would you improve Google Maps?

CANDIDATE: Here's how I'd think about improving Google Maps. First, I'd understand the goals and constraints. Then, I'd explore the user and their use cases. Next, I'd prioritize the use cases and focus on brainstorming solutions for the most urgent use case.

We could consider different goals such as increasing revenue, new user acquisition, engagement, and virality. I have engagement in mind, but is there another goal you prefer?

INTERVIEWER: Let's go forward with an engagement goal.

CANDIDATE: For users, there are a lot of audiences we could target: college students, young professionals, busy moms, and retirees. I'd like to focus on brick-and-mortar shoppers. Is that okay with you?

INTERVIEWER: Sure.

CANDIDATE: For a shopper, one of the most frustrating things is when you can't find what you need. All warehouse stores, such as Home Depot, Costco, and IKEA have this problem.

This frustration has a tangible dollar cost. For example, time spent finding a Home Depot item means fewer billable hours on the job site.

There are a couple of use cases we would need to keep in mind. First, the user should be able to specify what product they're looking for. Second, they should confirm that it is the right product. Third, they should receive a detailed map location, including directions and shelf location. Last, it should indicate the number of units available.

Let's brainstorm solutions on how this might work. In the interest of time, let's just pick one area to focus on. Normally, we'd consider business value, customer impact, and tech difficulty when prioritizing. In this case, let's just pick the most unique use case: the shelf locator.

INTERVIEWER: Okay.

CANDIDATE: Big-box warehouse stores have aisles that are several feet high and seemingly a mile deep. That makes shelf locators interesting.

I have a few solutions in mind for a shelf locator feature. My first idea is a picture that would show where a product is located. The picture would include surrounding products, to help the person locate it more easily, with the specific product highlighted in red.

The pro is that visual context helps to find things. The con is that it's not precise; the product could still be anywhere in the aisle. Also, it would be labor-intensive to get all the pictures.

Second, we could label each product area; for example, "Aisle 6, Section 2, Shelf 4." This would be precise and easy to find, but it would put a big burden on the store owner to geo-label each product area.

The third idea is to tag each product with RFID chips. RFID chips emit a radio frequency to allow electronic devices to identify and track products. While RFID chips aren't expensive, not all shoppers have RFID readers on their phones. Attaching RFID chips to each product would require some tooling overhead.

I'm attracted to the RFID idea because it's cool, but honestly, it isn't the most pragmatic. In this case, the most pragmatic solution with respect to time, ease, and cost of implementation is to simply label each product area.

Key Takeaway

Practice honest design. The world is littered with unusable products that "look awesome" or "sound innovative." Practicality matters. Don't be afraid to recommend the not-so-sexy solution.

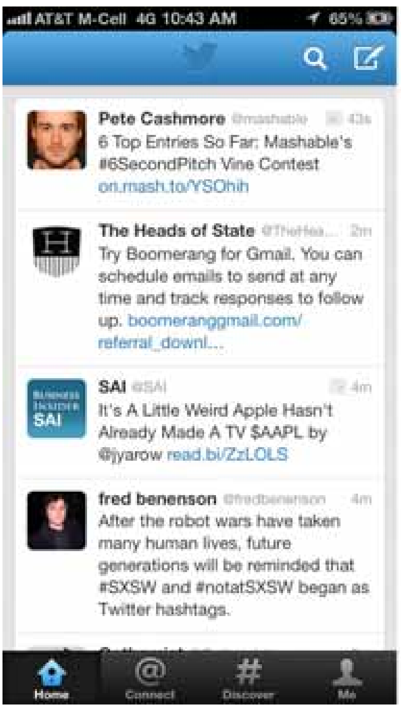
Chapter 4 Designing a Mobile App

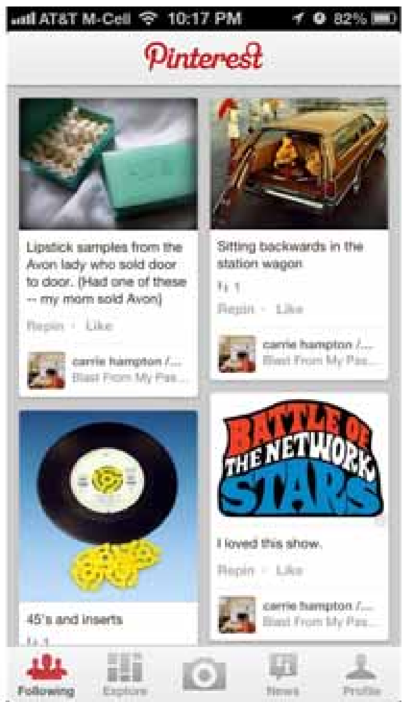
You can apply the same CIRCLES Method™ when asked to design a mobile app.

Tip: Memorize Design Best Practices

Wireframing is not easy, especially if it's not something you do eight hours a day. How does one get inspiration for common design elements?

Full-time designers struggle with this too. One way to get inspiration is to look at competing sites. Another way is to reference a design pattern library. Design patterns are documented solutions to common problems. For instance, there are common user interface solutions for newsfeeds, listing pages, and navigation menus.





Before your interview, take a moment to review popular design patterns. There's no need to design newsfeeds from scratch. It'll also make for a tricky discussion if you design a newsfeed that runs against your interviewer's mental model of what it should look like. Design patterns are available for desktop, web, and mobile user interfaces. Search Google for “web design patterns” or “mobile design patterns,” and you’ll find up-to-date resources on common design elements.

Practice Questions

1. Google shut down a location-sharing service called Google Latitude. How would you redesign and relaunch a location-sharing app?
2. Design a new iPad app for Google Spreadsheet.
3. How would you improve LinkedIn’s mobile app?

Answers

Google shut down a location-sharing service called Google Latitude. How would you redesign and relaunch a location-sharing app?

CANDIDATE: Do you mind if I ask some clarifying questions?

INTERVIEWER: Sure.

CANDIDATE: My understanding is that Google Latitude broadcast your location to your friends. And they could monitor your location, on a map.

INTERVIEWER: Yes, that’s the basic gist.

CANDIDATE: Why did Google Latitude fail?

INTERVIEWER: Bad PR and poor adoption. The running joke was that the only people who liked the feature were jealous spouses and significant others. In other words, privacy was a big obstacle.

CANDIDATE: Why is Google interested in rebuilding the feature?

INTERVIEWER: There’s a lot of potential with location sharing. From a user perspective, Google could improve its services if it knew where you were located. Google could provide relevant information, deals, and ads.

CANDIDATE: Okay, I have enough background information for now. Let me start by evaluating potential user personas. Monitoring appears to be a key benefit, so a few personas come to mind:

- Parents monitoring kids
- Pet owners monitoring pets
- Consumers monitoring packages
- Meeting participants monitoring the arrival of other attendees

INTERVIEWER: Can you elaborate more on each persona?

CANDIDATE: Sure, parents worry when they can't find their kids. If they knew where they were, they'd feel better. Pet owners have similar concerns.

Package delivery services offer tracking, but it's not in real-time or displayed on a map. Consumers could meet the delivery company if they had a better sense of when a package would be delivered.

Finally, meeting participants would save time if they could monitor attendance. Many meetings are delayed because participants don't know when an important attendee will arrive. Restaurants would fit this use case as well when deciding to release a reservation to another customer.

INTERVIEWER: Good. Of these use cases, which one are you most interested in?

CANDIDATE: I like the parent and pet owner use cases. Both personas worry about the safety of their kids and pets. This is a big problem, and they're willing to pay for a monitoring solution. I also like the restaurant use case because it could produce revenue. Anything that helps restaurants manage limited capacity is a win.

INTERVIEWER: Let's go with the parent use case. What would the solution look like?

CANDIDATE: The solution could feel like Google Latitude. However, while many kids have smartphones, we can't assume that all kids have smartphones. Also, smartphones can easily be lost or left in backpacks.

Instead, I would design a watch that would broadcast a kid's location and allow parents to subscribe to their location feed. The location feed could be provided on a map, email, or SMS. The kids wouldn't be able to turn off the broadcast.

INTERVIEWER: Doesn't that sound like Big Brother?

CANDIDATE: 24/7 monitoring does sound scary. But parents do 24/7 monitoring already. They incessantly call and text their kids for their whereabouts. And most parents do have authority. The kids might not like it, but some parents can get kids to do what they want.

Key Takeaway

Showcase your judgment. Interviewers are looking for candidates with good judgment. The candidate, in this example, focused quickly and wisely on parents. Privacy is less of an issue between parents and their children. And parents will pay a lot to ensure their kids' safety.

Design a new iPad app for Google Spreadsheet.

CANDIDATE: Sure, I can design a new iPad app for Google Spreadsheet. Before I take a moment to brainstorm some ideas, can I ask a few clarifying questions?

INTERVIEWER: Sure.

CANDIDATE: What is the goal of creating this iPad app?

INTERVIEWER: What do you think our motivation might be?

CANDIDATE: Well, the PC's share of total computing time is decreasing. More people are spending time on mobile devices. Google wants to promote spreadsheet usage across those mobile devices. It would be a missed opportunity if Google allowed a competitor to become the leader in mobile spreadsheet applications.

INTERVIEWER: That's right. This is a defensive play.

CANDIDATE: Before I brainstorm ideas, do we have any constraints?

INTERVIEWER: We typically release new Google products on Android before iOS. However, in this case, we are short on Android developers, so we're going to do iOS first. And don't worry about time constraints. We'd rather get the product right than rush something to market.

CANDIDATE: Can I recruit Android developers to help?

INTERVIEWER: You can try, but let's just say that's a moot point for now.

CANDIDATE: I'm not familiar with the Google Spreadsheet customer base. Can you describe who they are, what they're trying to achieve, and what they would like to see in an iPad app?

INTERVIEWER: Why don't you tell me what you think it is?

CANDIDATE: I feel the Google Spreadsheet user likes Google Spreadsheet for a few reasons. First, all the documents are stored in the cloud, which means they can be revised on any machine without worrying about version control.

Second, it's very easy to collaborate. Multiple spreadsheet users can view and edit documents at the same time, meaning no more emailing attachments to each team member, asking them to make changes, and then compiling all the changes.

Last, it's free for anyone with a Google account.

Google Spreadsheet doesn't have all the features of Microsoft Excel, so the spreadsheet is more likely to appeal to casual rather than expert users.

When it comes to casual users, many of them are spending more time with their mobile devices. They want to access their spreadsheets through Google Drive or the browser. However, manipulating a spreadsheet is very cumbersome. Tapping cells to edit, typing formulas, and selecting multiple cells – those things are just not fun to do on a mobile device.

There might be some other use cases, such as the need for more powerful charting functionality and running sophisticated analyses like regression. But, those are not likely something the casual user base would care about. They also seem out of the scope of the original question.

INTERVIEWER: You're correct. We want to build an iPad app that addresses the deficiencies of editing a spreadsheet on a mobile device. That's our top problem.

CANDIDATE: Okay, give me a moment to jot down some ideas.

The candidate writes the following:

- *Voice input*
- *Gesture input*
- *Edit later on a PC*

CANDIDATE: I have three suggestions to address the problem of editing a spreadsheet on a mobile device. The first idea is to have a voice input option that would allow the user to add the information or compute formulas by speaking.

The pros: voice input is fast and easy. The cons: voice recognition is not perfect and can be error-prone. It can also be embarrassing to use in public.

The second idea is gesture input. That is, create mobile device-friendly gestures to more easily manipulate a spreadsheet. For example, to add a column, the user could select the beginning and end of the column with his or her forefinger and thumb with a pinch motion. After the pinch motion, he or she could immediately draw a "+" to indicate an addition operation or draw an "X" to indicate a multiplication operation.

The advantage is that this would use multi-finger touchscreen technology for spreadsheet editing. The disadvantage is that the gestures would not be intuitive or obvious. Significant training would have to occur, possibly burdening the user with sitting through a tutorial.

The third idea is to use an "edit later on PC" feature. On the mobile device, a user could view spreadsheets and annotate changes to the spreadsheet. A simple one-click button would send a user notification to make changes the next time he or she was on the PC.

The pros: the user is more comfortable and productive when making changes on their PC. The cons: changes aren't made immediately. It adds an extra step to the process, leading to the likelihood that the user would forget or wouldn't have time to make the changes the next time he or she used a PC. This is my least favorite idea.

INTERVIEWER: Okay, I like those ideas. So, which one do you think we should pursue first?

CANDIDATE: I would rule out the third idea. It's neither effective nor immediate.

I use Siri a lot, so voice input is intriguing. However, voice recognition might not be practical for manipulating a spreadsheet. Besides, I use Siri because I want to use my phone hands-free, such as when I'm driving. I doubt anyone would or should edit a spreadsheet while driving a car.

That leaves us with a new gesture-based spreadsheet. I like that one. I think we could come up with some creative ways to build a spreadsheet that would leverage the multi-gesture approach possible on touchscreen devices.

INTERVIEWER: Thanks for the recommendation.

Key Takeaways

Disguise the framework. The candidate covered all the salient points in his framework without making it obvious.

Keep it conversational. The candidate kept his discussion conversational. As a result, he came across as relaxed, natural, poised and confident.

How would you improve LinkedIn's mobile app?

CANDIDATE: The LinkedIn mobile app has several features and pages. We don't have a lot of time, so let's pick a single page to focus on. Let's choose the user's profile page.

INTERVIEWER: Okay.

CANDIDATE: Let me review the page and see the key features: I see the user photo, name, connection, title, geographic location, and job industry. We have a few call-to-action buttons such as phone, email, and share profile with others.

We can see the user's recent activity, the connections we have in common, and the user's connections.

For the redesign, my goal is to improve engagement on this page. Are there any other goals I should consider?

INTERVIEWER: No.

CANDIDATE: Putting myself into the mindset of the user, I like LinkedIn as a networking tool. It's an opportunity to find new business opportunities, either through new or existing connections.

Let's say Dan is someone I'm targeting for a business opportunity. My biggest questions are:

- How can I get Dan to engage?
- What matters to Dan and why?

The second question is particularly important. If I know what is important to Dan, I can perhaps offer something of value. By showing value, Dan is more likely to reciprocate and participate in my business opportunity.

Give me a moment to collect my thoughts and see how I would redesign this page to capitalize on this insight.

The candidate draws on the whiteboard:

Okay, here's how I would redesign it. The top half is largely the same. I moved the share profile button to the upper right and removed the call button. The message button is significantly bigger to emphasize the primary importance of this call-to-action.

The bottom half is completely redesigned. It shares three new information fields:

- **What I'm Working On**. It's a one-line field for the user to indicate their top deliverable for the day or week. In this case, we see that Dan is working on a blog post on the housing bubble.
- **What Keeps Me Up**. This is another one-line field where users can indicate their fears. In this case, Dan is concerned that he can't link his marketing efforts with the company's ROI goals. We can infer that this is about job security.
- **Where I Could Use Help**. This is also a one-line field. Dan can be specific about what he can use help with. Sometimes people are unaware of what help they need, so that's why the previous two fields are so critical.

What I love about this solution is that it would greatly increase the opportunities for business development. What I don't like about this solution is that it would require the user to be proactive about updating their status messages. We wouldn't get 100 percent compliance.

Key Takeaways

Impress the interviewer with consumer insight. Groundbreaking innovations typically revolve around a subtle but untapped consumer insight. For example, a pair of entrepreneurs recognized that traditional dating apps give *men* control. They exploited this insight and created an app that gave *women* control. In this sample response, the insight focuses on an important obstacle that impedes business relationships: the target's motivation.

Chapter 5 Designing a Consumer Product

You can apply the same CIRCLES Method™ when asked to design a consumer product.

Tip: Don't Blindly Follow Frameworks

Whether it's the CIRCLES Method™ or a different design framework, don't blindly follow it. It'll sound scripted. Not too long ago, a product management candidate started the design interview with "First, I want to understand the product. Second, I want to talk about potential customers. Third, I want to talk about their needs. Fourth, I will prioritize their needs. Fifth, I will brainstorm solutions. Sixth, I will evaluate trade-offs. Seventh, I will make my recommendation."

Interviewers will react to candidates who sound robotic. Some will label the person as over-prepared. Others, like me, would fear that the candidate was inexperienced. Inexperienced candidates lack confidence. They are more likely to strictly follow a prescribed framework.

Contrast the previous response with the following: "I'm not too familiar with the product. Can you tell me more about it? That's fascinating. I can see why they would find feature X valuable. However, it doesn't quite sound like the product meets their needs. Do you mind if I explore that in more detail?"

This feels like a conversation I could have with a co-worker. The candidate also seems polished and confident. The interview is about establishing credibility and likability. Interviewers don't like robots. They like candidates with personality.

One last thing, the interviewer is looking for problem solvers who think critically. Frameworks are meant to be memory aids. Adapt them to specific interview questions. Trust and use your judgment when deciding which parts of a framework to leave in and which to leave out. You'll be amazed at how natural your responses sound. And you'll have more fun when you're not straining to parrot a technique from a book.

Practice Question

1. Redesign a garage door opener.

Answer

Redesign a garage door opener.

CANDIDATE: Is this for residential or commercial?

INTERVIEWER: Residential.

CANDIDATE: And what's the goal of the redesign? Increase market share? Increase revenue?

INTERVIEWER: Your boss is the owner of a garage door company. Garage doors haven't evolved much over the last few decades. He feels a redesign of the garage door opener could lead to differentiation and more market share for the company.

CANDIDATE: I'll start by exploring the user problems. When I think about the problems, a few come to mind:

1. The garage door opens slowly. Maybe it doesn't take this long, but it feels as if it takes 10 to 15 seconds to open or close.
2. Sometimes, as I'm leaving home, I'm not sure if the garage door closed. There's a nagging feeling that it might still be open.
3. The garage door opener is an extra device. I feel that I should be able to open and close the garage door with my smartphone.

I'd like to brainstorm a couple of solutions.

The first idea addresses use case number 3, which is opening the garage door using a smartphone. The garage door could be connected to a wireless network, and a smartphone app could automatically open and close the garage door. The benefit would be that the user would no longer need an extra electronic device to open the garage door.

The downside would be that this wouldn't serve those who don't have smartphones. The good news is that American smartphone penetration is nearly 70 percent and growing. Another downside would be smartphone connectivity might not be reliable. The local wireless and cellular networks would introduce additional points of possible failure.

The second idea addresses use case number 2, which is not being sure the garage door closed. We could provide an SMS, email, or in-app confirmation of whether the garage door closed. The app could also monitor the garage door's state and provide alerts when the garage door was open.

This would be especially valuable when the garage door should be closed, such as during the workday. There are no true cons to this idea; it's better than constantly worrying or waiting 10-15 seconds for the garage door to close before leaving home.

The third idea addresses use case number 1, which is that the garage door opens slowly. We could include a timer function so that the garage door would automatically open at preset times and days. While this would alleviate the problem of having to wait for 10-15 seconds, there could be issues, especially if it opened on days when it didn't need to be open or if it automatically closed when a child was underneath. It seems better to simply have the garage door open and close on demand.

INTERVIEWER: Okay, so what would you recommend?

CANDIDATE: I would recommend developing the first two ideas.

Key Takeaway

Adapt your conversational pattern. Candidates feel less pressure to carry the conversation when they have an interviewer who likes to banter. Talkative interviewers also provide valuable conversational clues. However, candidates can't choose interviewers. For instance, in this sample answer, the candidate does most of the talking. Role-play with different interviewing styles, so you're not caught off guard.

Chapter 6 Designing a Service or Other Product

You can apply the same CIRCLES Method™ when asked to design a service or other product.

Tip: Ask the Five Whys to Understand Unarticulated Problems

As part of understanding customer needs, you may have to delve into a customer's workflow with their existing solutions. To find areas for improvement, you'll have to understand the obstacles they are facing and gaps that existing solutions have left open.

Here's an easy way to determine gaps: ask the "Five Whys." This is a technique popularized by Toyota. It involves an iterative inquiry to identify a problem's root cause. In this case, we'll use it to diagnose problems with processes, proposed innovations, and existing customer solutions.

Five Whys Example

Question	**Answer and the corresponding issue**
Why does the production line close every third Sunday?	That's the day for scheduled equipment cleaning.
Why do we have to clean the equipment?	Dirt and dust will damage critical parts, leading to more downtime if a part must be replaced.
Why does cleaning take all day?	We disassemble the machine part-by-part and then clean all the internal parts.
Why can't we reduce the cleaning time?	We could if we simply put inexpensive aluminum foil on the parts that get dirty often.
Why haven't we covered the parts that get dirty often with aluminum foil?	The procurement department won't approve the aluminum foil purchase.

Practice Questions

1. Assume you are the new product manager for the Amazon Prime business. What data would you look at to develop new features? What new features would they be?
2. The billboard industry is under-monetized. How can Google create a new product or offering to address this?

Answers

Assume you are the new product manager for the Amazon Prime business. What data would you look at to develop new features? What new features would they be?

CANDIDATE: Before we jump into the question, do you mind if I clarify my understanding of Amazon Prime, especially the service and the benefits to both the customer and Amazon's overall business.

INTERVIEWER: Sure.

CANDIDATE: I understand that Amazon Prime is a membership club. Amazon Prime members get free two-day shipping for every order they place. They can also stream movies and TV shows for free and borrow books from the Kindle library.

Correct me if I'm wrong, but I believe the biggest benefit for Prime members is shipping. Normally, free super saver shipping takes five to eight days to arrive. Two-day shipping is a big improvement. By making it available for all orders, Amazon Prime's two-day shipping benefit likely reduces indecision around whether to upgrade from free super saver to a one-time shipping upgrade.

I've heard Amazon Prime helps the business because:

- Customers order more frequently.
- Customers spend more.

- Customers buy products they wouldn't otherwise buy at Amazon.
- It leverages Amazon's competitive advantage, an ultra-fast fulfillment process.
- Customers have high satisfaction.
- It steals wallet share from competitors.

Okay, so back to the question. If I were to develop new features, I'd start with the business goal. What is Amazon trying to achieve? The goal can include any of these metric increases:

- Sales per Prime customer
- Number of Prime customers
- Prime customer satisfaction

Let's say the goal is to increase the number of new Prime customers. I've heard that Amazon has approximately 30 million customers, with anywhere from 5 to 30 percent opted into the Prime program.

We would need to investigate why regular Amazon customers don't try Amazon Prime. It could be for several reasons:

- They aren't aware of it.
- They aren't interested or don't see the value in it.
- They are interested but not willing to make the effort.
- They tried it but don't want to pay for it.

Based on your knowledge, what's the primary reason customers don't try Amazon Prime?

INTERVIEWER: 65 percent of Amazon customers are aware of Amazon Prime, but only half of that group paid for it. The half that didn't pay felt the value proposition wasn't compelling.

CANDIDATE: Thanks for the insight. Unless you disagree, let's assume that marketing is not the reason there's not enough interest. Putting that out of scope allows us to focus our discussion on developing new product and program features.

INTERVIEWER: Okay.

CANDIDATE: When it comes to developing new features, I'd like to see data on customers' top pain points with their Amazon shopping experience. Then we'll construct new Prime features to address the top pain point. Off the top of my head, I feel these are the top Amazon customer pain points:

- Can't find the product they need
- Not a bargain
- Not timely
- Too much of a hassle to buy online

Okay, I'll go ahead with that "can't find the product they need" use case. Give me a moment to brainstorm some ideas.

The candidate takes 60 seconds to brainstorm.

CANDIDATE: I have a few features in mind to solve that problem:

- Personal Shopper
- Free Return Shipping
- Product Perks Club

Personal Shopper would give each Prime member customized help when shopping for products. They would provide customized gift ideas, research products, and help navigate Amazon's seemingly endless database. Customer satisfaction and purchases would likely go up — even for existing Prime members. The downside would be that this concierge service would be costly.

Free Return Shipping would give the customer assurance that if they bought the wrong product, they could easily return it later without incurring additional shipping costs. This might lead to new Prime customers, but it would also increase costs for not only new Prime customers but also existing Prime customers.

Product Perks Club would be a special club where customers would be invited to sample or test products and write reviews. This would introduce the Prime member to new products and make them feel special. Maybe the cost could be partially subsidized by manufacturers who wanted to get their products in front of Amazon customers.

Of the feature ideas presented, I feel that the Product Perks Club has the best benefits and the lowest cost. Customers and advertisers would like it. The costs could be manageable, especially if subsidized by advertisers.

However, the feature that could have the most impact is the Free Return Shipping. The inability to return is what I feel is a big barrier to driving more purchases from brick-and-mortar to online. Free return shipping could lead to a significant group of new Amazon Prime customers.

Key Takeaways

Define metrics. In a data-driven world, some interviewers find it insufficient if you just define a broad goal like increasing engagement. They want to hear specific metrics. Specify those metrics upfront.

Do not suggest duplicate features. It's difficult to keep up with tech trends. As a result, candidates sometimes suggest feature ideas that already exist or have been tried in the past. In this sample answer, the candidate mentions a Product Perks Club that sounds just like Amazon's Vine program. You don't want the interviewer to tune you out because you suggest a feature she has heard before.

The billboard industry is under-monetized. How can Google create a new product or offering to address this?

CANDIDATE: Okay, you want me to design a new product that will change the billboard industry. Analyzing why the billboard industry is under-monetized is out of scope, correct?

INTERVIEWER: You got it.

The candidate writes the following on the whiteboard:

Customer problems

- *Ads are irrelevant*
- *Ads are static*
- *Ads have poor recall*

CANDIDATE: Okay, I always start with the user. In this case, it's the commuter who sees the billboards. There are a couple of challenges:

1. First, not all billboards are relevant. When I drive along Highway 101, there are many billboards focused on technology enterprises. These billboards aren't relevant to all commuters.
2. Second, billboards don't change. There's a missed opportunity to add more information on a billboard, especially if a user is stuck in traffic and has time to read more.
3. Third, it's hard to remember the contents of a billboard. If I want to research or follow up on the advertised company, it's tough. The web address, phone number, even the name — these are things I'd like to remember but can't because I'm focused on driving.

INTERVIEWER: How would you solve these problems?

CANDIDATE: Give me a moment to brainstorm.

There is a 30-second pause.

CANDIDATE: Let's start with the second use case, billboards don't change. We could upgrade the billboards to rotate through different ads. There are electronic billboards today, but I've found the ad rotation to be limited. Google could expand the ad rotation by:

- **Bringing new advertisers**. Google could introduce its advertisers to billboard advertising, which would be a new medium for many.
- **Introducing new ad formats and layouts**, including multiple ads on a single billboard.
- **Implementing a real-time ad auction system**. I presume that billboard ads are sold monthly, which limits ad competition and variety. By allowing advertisers to compete for ad space in real-time, it would increase the ads available for rotation.
- **Offering targeting opportunities**

INTERVIEWER: What kind of targeting opportunities would you offer?

CANDIDATE: Obvious targeting options include location, time of day, and day of the week. Targeting could get more advanced. We could target based on weather or traffic patterns. Just imagine this relevant ad: "Stay in this traffic and get back home by 8 p.m. Or get a $10 day pass at Acme Fitness, work out while the traffic dies down, and you'll get home by 8:30 p.m."

INTERVIEWER: How would the real-time ad auction work?

CANDIDATE: Allow advertisers to bid on every single impression available in Google's inventory, just like online ad exchanges. By making bidding real-time, it would allow advertisers to pay more for targeted impressions that count and less for impressions that don't.

INTERVIEWER: Okay, how about the other two use cases?

CANDIDATE: For the first use case, advertising relevancy, the aforementioned targeting options would make advertising more relevant. But I feel Google can take it one step further.

For example, Google has developed a core competency around computer vision through Google's driverless cars. It wouldn't be a stretch for Google to adapt computer vision to recognize cars on the road. For instance, it could detect a Black Lexus SUV or recognize letters on a license plate.

Based on that data, Google could show an ad appropriate to that driver or cluster of drivers. For example, commuters who drive luxury cars are more likely to respond to an ad about an exotic Mediterranean vacation.

INTERVIEWER: Unique idea, but wouldn't that be controversial?

CANDIDATE: You mean target ads based on a license plate number?

INTERVIEWER: Yes.

CANDIDATE: I agree that there are privacy implications and that's something that would have to be researched. We would have to develop well-thought-out talking points before the feature could go to market.

INTERVIEWER: Okay, how about the third use case?

CANDIDATE: It's hard to remember the contents of a billboard. We could create a billboard search engine to help commuters with recall. Users could enter a company name and location. Or we could make it more advanced. Perhaps users could browse through a shortlist of billboard ads based on the user's recent travels, garnered from smartphone GPS chip data. Or perhaps we could offer a voice-recognition feature on smartphones to bookmark billboards during a drive.

These recall solutions aren't perfect, but they're better than other ideas I've considered, which include asking users to take a picture of a billboard or memorize a website or offer code. Those ideas are either too difficult or too distracting for users who are driving.

Key Takeaway

Research relevant knowledge before the interview. The candidate doesn't flaunt it, but it's clear he is versed in online advertising trends. Interviewers believe a candidate can do the job (and are more likely to hire him) when that candidate uses relevant and appropriate terminology, concepts, and trends. Do not assume that the interviewer is okay with your inexperience or lack of knowledge. Anticipate interview topics in advance and prepare.

Chapter 7 Getting Technical

The technical interview drives fear into PM candidates' hearts.

During a technical interview, candidates may be asked:

- **Technical definition** questions such as "Explain how the Internet works."
- **Algorithm and data structure** questions such as "Write an algorithm that detects meeting conflicts."
- **System design** questions such as "Explain how you would implement a micro-blogging site like Twitter."
- **Technical experience** questions such as "Tell me more about the Android app you built two years ago."

The good news is not all companies ask technical questions. Ask the recruiter, hiring manager, or friends at your target company whether the company does this. For example, expect a technical interview if you reach the on-site interview at Google.

Why does Google care whether PMs are technically proficient? Google PMs are expected to lead engineers, and a technically fluent product manager will garner respect.

How to Approach a Technical Interview Question

When tackling a technical interview question, keep the following steps in mind:

1. **Understand what is being asked**. If necessary, clarify the goal and the problem statement.
2. **Work through the simple base case**. The solution and the accompanying clarifying questions will be more apparent as you work through it.

3. **Think out loud**. Help the interviewer understand where you're headed. She may even intervene and provide helpful guidance.
4. **Write the technical solution, if necessary**. For most organizations, they don't expect the syntax to be perfect; pseudo code is fine.
5. **Review the code**. Evaluate the strengths and weaknesses. Revise as necessary. Few can write code without bugs in the first pass.

Key Concepts to Study

Here's a list of key concepts to study when preparing for a technical interview:

Algorithms

- Big O notation

Data Structures

- Arrays
- Hash Tables
- Linked Lists
- Stacks and Queues
- Trees
- Heaps
- Tries
- Graphs

Technical Concepts

- How a Web App Works
- Recursion
- Machine learning fundamentals

A Google search for the terms above will point you to the most recent and relevant primers. Then try the sample questions below, along with other technical questions companies normally ask entry-level software engineers. Companies understand that you may not have day-to-day coding experience, but they do want you to attempt the technical questions.

Practice Questions

1. Brainstorm as many algorithms as possible for recommending Twitter followers.
2. Explain recursion.
3. Explain object-oriented programming to your grandmother.
4. How would you reduce Gmail's storage size?
5. How would you design a blogging application?
6. You're part of the Google Search web spam team. How would you detect duplicate websites?
7. Write an algorithm that detects meeting conflicts.
8. Design an elevator control system.
9. There's a server bottleneck. How would you solve it?

Answers

Brainstorm as many algorithms as possible for recommending Twitter followers.

CANDIDATE: Okay, give me one moment to think about this.

The candidate jots down the following:

- *Actions: view or follow*
- *View relationships: stalker or acquaintance*
- *Follow states: following, being followed, or mutual following*

CANDIDATE: When I mull this problem, I think of behaviors/actions, view relationships, and follow states.

For behaviors/actions, I think about whether a Twitter user views another's profile or follows another.

For view relationships, I will consider two view-based relationships. If a user views the other, but the other user does not view back despite a suggestion, we'll call that a stalker relationship. However, if both individuals view one another when suggested, they likely know each other. We'll call that an acquaintance relationship.

Last, for the follow states, there are three scenarios I see. First, the viewer follows the one being viewed, but not the other way around. Second, the one being viewed follows the viewer, but not the other way around. Third, they both follow the other.

To summarize, on Twitter, there are two view relationships:

- Stalker: A views B. B does not view A.
- Acquaintance: A views B. B views A.

Here's a visual representation of these relationships:

	A views B	**A does not view B**
B views A	Acquaintance	Stalker
B does not view A	Stalker	No relationship

We can improve the algorithm to suggest a third user C – to either user A or B – depending on A's and B's relationship to C and to each other.

The table below visually represents the permutations:

	A following C	**A followed by C**	**A acquaintance of C**
B followed by C	A > C > B	A < C > B	A <> C > B
B following C	A > C < B	A < C < B	A <> C < B
B acquaintance of C	A > C <> B	A < C <> B	A <> C <> B

INTERVIEWER: Okay, you've indicated several different algorithm options. Which one would you choose?

CANDIDATE: Well, I would implement all the algorithms, run A/B tests, and see which one has the best suggestion-to-follow ratio. But I believe you're asking me to prioritize which one I would like to try first.

The one I like best is A <> C <> B. That is, if A is an acquaintance of C, and B is an acquaintance of C, then A and B are likely to be acquaintances too. It's a phenomenon modeled on real life. That is, assuming C knows A and B well, at some point C will introduce A and B to each other.

INTERVIEWER: Thanks for the recommendation.

Key Takeaway

Be comprehensive. For algorithm questions, it's important to evaluate all cases. Don't miss those edge and corner cases.

Explain recursion.

CANDIDATE: Outside of work, I've been teaching computer programming to eighth-grade kids in East Palo Alto. Two weeks ago, I taught them a new programming concept called recursion. I introduced it with Wikipedia's definition:

Recursion is a method where the solution to a problem depends on solutions to smaller instances of the same problem.

As you can imagine, their eyes glazed over. I could have explained by writing this code, but I don't think it would have helped.

The candidate writes the following on the whiteboard:

```
unsigned int factorial(unsigned int n) {
  if (n == 0) {
    return 1;
  } else {
    return n * factorial(n - 1);
```

```
  }
}
```

Then I remembered an answer I read on Quora. It used a movie theater analogy to explain recursion.

Inspired by that example, I told the students:

"Let's say you're in a movie theater where the rows are not numbered. Someone asks you which row you're in. You don't want to count, so you ask the person in front of you which row he's in. He doesn't want to count either, so he asks the person in front of him which row that person is in.

This continues all the way to the person in the front row. That person doesn't see anyone in front of him, so he tells the person behind him that he's in the 1st row. The guy in the 2nd row adds 1 to that response and tells the person behind him that he's in the 2nd row.

This continues back to you."

The example worked. The students understood the concept by affirming that the question "Which row am I in?" can be rephrased (recursively) as "How many people are in front of me + 1?" with a base case of zero. Some students even recognized that requests could be pushed on and off the stack. Most importantly, I was proud that youngsters grasped a concept that many college students struggle with.

Key Takeaways

Compare and contrast. It's not enough to present the answer alone. It must be juxtaposed against an alternative answer; otherwise, the listener can't admire your brilliance. This sample answer artfully compares the winning answer against inferior alternatives.

Beware of analogies. Analogies help less technical audiences understand complex concepts. They're also easy to remember. However, choose carefully. Pick an ill-fitting analogy, and your listener will tune out the rest of your answer.

Explain object-oriented programming to your grandmother.

CANDIDATE: I'll start by explaining object-oriented programming (OOP).

OOP organizes computer code into objects. This is different from conventional programming, where programs are just a sequence of tasks. The main idea is objects vs. tasks.

Now, I'll give an example my grandmother would understand. Let's say we're programming a car racing game. There are several different cars in the game.

We can program an object called a "car." The car object has a state and operations:

The car's state includes current speed, brake on and off, and steering direction.

The car's operations can include accelerate, brake, and steer.

Let's say the first car in the game is a Toyota. Now, if we want a BMW, we don't need to create a brand-new car from scratch. We can just derive the new BMW based on the basic car object, because the BMW, like all car objects, can do three things: accelerate, brake, and steer. And the BMW car can add special properties such as a windshield wiper that automatically adjusts its speed based on how heavy the rain is falling.

Why do we need OOP? There are a couple of reasons. First, it saves time. If we already have a car object, we don't need to program identical functionality multiple times. Second, the object metaphor is easy to understand. It's easy to communicate to others the ideas of creating objects and objects that can do actions other objects cannot. Last, this programming convention keeps things organized. For example, a convertible can remove its vinyl top, while a regular car should not. By limiting the vinyl top removal action to the convertible car object, we limit unintended actions from regular cars.

Key Takeaway

Edit your response judiciously. The interviewer's main goal is to test your understanding of technical concepts. While most answers are too shallow, some responses can be too deep. This sample answer straddles that balance perfectly. It is factually correct while tastefully leaving out advanced and potentially confusing details, such as encapsulation and polymorphism.

How would you reduce Gmail's storage size?

CANDIDATE: Give me a moment to brainstorm some ideas.

The candidate writes the following in his notes:

- *Compression*
- *Deletion*
- *Client-side storage*
- *Off-site storage*

	Description	Pros	Cons	Mitigation
Compression strategy 1	Apply a compression algorithm	More space	Slower access; likely doing this already	Selectively choose messages
Compression strategy 2	Concatenate files, then compress	More space	Slower access	Selectively choose messages

Deletion	(Self-explanatory)	More space	Couldn't auto-delete messages; would go against Gmail's original brand promise	Quotas, overage charge, auto-delete after X days
Single item storage	Keep a single copy of an email, images, and attachments that are included in multiple emails	More space	N/A	
Client-side storage	Store some emails on client machine	More space	Couldn't access all messages everywhere	Selectively choose messages
Off-site storage	Store some emails on off-site storage	Lower cost	Slower access times	Selectively choose messages

CANDIDATE: I've thought of at least four different ways Gmail could save storage space.

The candidate walks to the whiteboard.

CANDIDATE: Let me describe each one, and I'll talk about the pros and cons of each.

The candidate then describes the table above in detail.

Key Takeaways

Assess the question and interviewer's intent. Answer with the CIRCLES™ framework but go directly to brainstorming solutions. We can infer that the interviewer did not want the candidate to discuss the problem, persona, or prioritization, based on the question prompt.

Brainstorm multiple solutions. A long list of thoughtful options is more impressive than one or two ideas. You'll also find that your ideas will be more unique and innovative as you brainstorm more.

How would you design a blogging application?

CANDIDATE: Are you asking me to develop a blogging application for the web, desktop, or mobile?

INTERVIEWER: Web.

CANDIDATE: And are you looking for the UI or something else?

INTERVIEWER: I want you to specify the data model and key functions. Then I want you to walk me through how those functions get called.

CANDIDATE: I'd start by creating the data model. There are a couple of things we would need to store:

Blog post data model:

- Blog post number
- Title
- Body content
- Entry date

Comments data model:

- Comment number
- Comment name
- Comment author's email
- Body content
- Entry date

Then, I'd create a few functions:

- GetAllPosts()
- GetSinglePost()

    - GetComments()
- AddNewEntry()
- ShowSinglePost()
    - AddComment()
- ShowAllPosts()

I'll walk you through how all this would come together:

- The user would visit the blog home page. This would call GetAllPosts(), which would get the last 10 blog posts in reverse chronological order.
- Once the data was retrieved, ShowAllPosts() would put the information in the appropriate view, which would include the HTML rendered in the user's browser.
- A user could click to see a specific blog post. This would GetSinglePost() and a subroutine, GetComments(), which would retrieve that specific blog post and comments from the database.
- Once the data was retrieved, ShowSinglePost() would put the information in the appropriate view.
- If the user decided to add a comment, it would call AddComment(), which would save the author's comment to the database, after appropriate authentication.

Key Takeaways

Treat it as a brainstorming exercise. While this system design question might sound intimidating, you see that this question is fundamentally a brainstorming exercise. Think through the inputs (data), triggers (functions), and outputs (what to show the user). Be as thorough as possible; you don't want to miss pieces that the interviewer is looking for.

Ask clarifying questions. System design questions have a wide scope. Don't make the mistake of going on a tangent that's immaterial or doesn't answer the interviewer's question. Clarify what's in and out of scope at the onset.

You're part of the Google Search web spam team. How would you detect duplicate websites?

INTERVIEWER: People are copying content across websites. Develop an algorithm to determine which one is the original and which one is the copy.

CANDIDATE: Give me a moment to brainstorm some solutions.

Here are the solutions that come to mind:

- Google could apply a hash function (#) to the content; subsequent pages with similar content would be duplicates.
- Google could assume that content with the most hashes of inbound links was the original.
- Google could embed a unique ID to a page. Ensuing pages without a unique ID, but with the same content, would be duplicates.
- Google could compare timestamps for similar webpages; assume the earliest one was the original.
- Google could factor domain reputation. Domains that are known to copy original content would be penalized.

Here are the pros and cons of each solution:

Solution	Risks
Apply a hash function; subsequent ones would be duplicates.	Google might incorrectly process the copied page before the original page.
Assume content with the greatest number of inbound links was the original.	Bad actors could set up a content farm, inflate the number of links, and game the system.
Embed a unique ID to a page. Ensuing pages without a unique ID, but with the same content, would be duplicates.	This would require additional work for webmasters. Also, there might not be 100 percent compliance.

Compare timestamps for webpages; assume the earlier one was the original.	Webmasters could fake early timestamps.
Factor domain reputation. Domains known to copy original content would be penalized.	Penalizing domains with a history of copying original content could require manual intervention, which would be slow and costly.

Given the pros and cons, I would recommend that we apply the following solutions: hash function, unique ID, and domain reputation.

Key Takeaway

Display your technical knowledge. Many interviewers worry about hiring product managers who aren't technical enough. Find opportunities to show your technical knowledge. This sample answer does it well by mentioning the "hash function" solution. Be wary of overdoing it.

Write an algorithm that detects meeting conflicts.

CANDIDATE: Let me work through a simple example first. Then I'll write code to address all cases.

Let's say the first meeting starts at 9 a.m. and ends at 11 a.m. The shorthand would be:

- S1 (start of the first meeting): 9 a.m.
- E1 (end of the first meeting): 11 a.m.

There's a conflict if the 2nd meeting starts before 11 a.m. or ends after 9 a.m. Representing this in shorthand:

- S2 < E1
- E2 > S1

To help visualize this:

We can represent the (S2 < E1 or E2 > S1) logic in our code below:

```
bool IsConflict(Datetime s1, Datetime e1, Datetime s2, Datetime e2) {

        return (s1 < e2) && (e1 > s2);

}
```

Key Takeaway

Keep calm and stay positive. Most PM candidates freeze when hearing a technical question. This is normal. However, as this sample answer illustrates, if the candidate can calm his nerves and understand the situation, he'll find that a one-line logic statement provides the answer.

Design an elevator control system.

INTERVIEWER: I'd like you to design a control algorithm for an elevator system.

CANDIDATE: Do you mean an algorithm for how to respond to incoming passenger requests and the corresponding elevator actions?

INTERVIEWER: Yes, that's correct.

CANDIDATE: Sure, give me a moment to brainstorm.

The candidate pauses for 60 seconds.

Approach	Description	Analysis

First come first served (FCFS)	Would process passengers as they arrive.	Would minimize latency with little regard to throughput.
Shortest seek time first (SSTF)	Would process passengers from the closest floor.	Elevator moving time would be minimized. It would have better throughput than FCFS, but the request might be delayed if many closely related passengers arrived after it.
SCAN	Would visit the top floor before changing direction and sweeping back to the first floor.	Movement time would be minimized and fairer than SSTF.
Circular SCAN (C-SCAN)	Would visit the top floor, wouldn't pick up any passengers on the way back to the 1st floor, and then would start picking up passengers again.	Fairer performance than SCAN because middle floors would not be serviced twice as often.
LOOK	Like SCAN, an elevator would make use of information about locations requested. For example, as the elevator moved to the top floor, it would reverse if there were no waiting requests for locations beyond the current floor.	Movement time would be minimized.
C-LOOK	Similar to LOOK and C-SCAN.	Movement time would be minimized with the benefit of C-SCAN.

CANDIDATE: Here are some algorithms I brainstormed. I'll explain the algorithm and then discuss the pros and cons of each.

The candidate walks the interviewer through the table above.

Key Takeaway

Use analogies. New innovations borrow heavily from existing ideas. In this case, knowing how a hard drive head moves across a platter helps. Better candidates will apply hard drive insights to this question.

There's a server bottleneck. How would you solve it?

INTERVIEWER: Let's say you have a SharePoint server in the U.S. It stores your clients' insurance information. Your colleagues want to access and update the information, but they're complaining about long wait times and network disconnections. How would you solve it?

CANDIDATE: I haven't analyzed server bottlenecks since college. Do you mind if I ask a few clarifying questions?

INTERVIEWER: Okay.

CANDIDATE: When it comes to slow response times for a SharePoint site, I can think of several causes: network, server, storage, database, application latency.

Network latency can be caused by slow or overloaded network connections at the data center or the end user's location. A slow Internet backbone can also be the cause of network latency.

Server latency is caused by slow processors and inefficient server hardware architectures.

Storage latency is due to slow performing storage devices. Solid-state drives and in-memory solutions offer higher performance.

Database (DB) latency occurs when the application makes frequent database trips. DB latency can be especially challenging when the DB is being used to store binary data in situations where DBs are meant to store relational data.

Applications are inefficiently slow if they use suboptimal data structures and poor algorithms. Applications can also be unnecessarily slow if they run on operating systems that aren't optimized for the latest hardware. Last, SharePoint applications can be slow if there are deadlock scenarios.

INTERVIEWER: Thanks for your preliminary diagnosis. Let's continue the hypothetical situation. Let's say the IT team has ruled out network, server, storage, and application latency. They've isolated it to database latency. What next?

CANDIDATE: One way to solve database latency is to use a different back end. Many companies are now using NoSQL solutions such as MongoDB to store non-relational data. Unfortunately, the last time I checked, SharePoint does not support NoSQL, not even Windows Azure Tables, Microsoft's version of NoSQL.

Another solution is to migrate SharePoint binary data into documents that are stored on a file system or SAN/NAS storage. This would minimize DB trips and DB latency.

The last suggestion I have is to utilize an in-memory distributed cache. This would alleviate database traffic with a cache system that's optimized for read operations.

Key Takeaway

Use the Rule of Three. The Rule of Three is a communication concept. It states that information in a series of three (or more) is more satisfying, effective, and memorable. This sample answer employs the Rule of Three by decomposing latency issues into five broad areas: network, server, storage, database, and application latency.

Chapter 8 Getting Analytical: Estimation

Estimation questions have been incorrectly labeled as brainteasers because some estimation questions seem too corny to be taken seriously. Here are some classic examples:

- How many golf balls can fit in a school bus?
- How much does a 747 weigh?

Look past the wackiness. Estimation questions have real-world practicality. PMs make decisions all the time. For example, how many servers should an AWS PM order? Or should a PM attend to a customer complaint about a new feature? Both decisions rely on good judgment. That judgment is often based on the PM's estimate.

Interviewers also use estimation questions to evaluate your listening and problem-solving skills. They want to see whether you can identify and choose assumptions judiciously. It wouldn't make sense if I claimed that a 747 weighs 1,000 pounds, would it?

There are two ways to answer estimation questions: top-down and bottom-up.

Top-Down Estimation Method

The top-down approach starts with the whole and works its way down to the parts. For instance, to estimate sales of an Xbox console, a top-down approach would start from the total available market — that is, anyone who can afford an Xbox. In this case, a candidate might start with the U.S. population and then home in on the target market, which is a subset of the available market.

Bottom-Up Estimation Method

The bottom-up approach hinges on observations. That is, collect a single specific data point and then assume that what's true for a single specific data point can be assumed for the general data point in question. For instance, if we are trying to estimate iPhone sales in the U.S., we might start by visiting a single Apple store in New York City. With a clipboard in hand, we might ask outgoing customers whether they bought an iPhone. After an hour's worth of data, we could make inferences about how many iPhones are sold in the store in a given day, month, or year. And from there, we could infer sales across all Apple stores in the U.S.

Practice Questions

1. Estimate McDonald's revenue.
2. How many queries per second does Gmail get?
3. How many iPhones are sold in the U.S. each year?
4. Estimate how much it costs to run Flickr for a 20 GB user.
5. How many elevators do you need for a 50-story building?

Answers

Estimate McDonald's revenue.

CANDIDATE: For this question, are you expecting an actual number? Or do you want me to just talk through how I'd find this number in real life?

INTERVIEWER: I don't question your ability to find the number in McDonald's SEC filings. Instead, I want you to provide a back-of-the-envelope estimate.

CANDIDATE: And to clarify, are you looking for McDonald's annual U.S. revenue?

INTERVIEWER: Annual revenue, yes. But I want the international revenue number.

CANDIDATE: Okay, here's how I'll approach the question. I'll do a bottom-up approach. I'll first estimate the revenue of a single McDonald's store here in the U.S., and then I'll multiply that number by the number of U.S. stores. Finally, I'll extrapolate the U.S. revenue number to an international number.

INTERVIEWER: Okay, go for it.

CANDIDATE: I believe most McDonald's stores are open 24 hours, or at least from 7 a.m. to 11 p.m.

I believe that a single McDonald's busiest hours are 8 a.m. to 8 p.m. every day. During these peak times, there are 50 to 80 groups of customers per hour. If we take the midpoint of the range, we get 65 groups. A group could be a single customer or a family of four. Let's say it is two people, on average. So then 65 times 2 equals 130 customers per hour.

Kids usually order happy meals, which retail for $5. Adults usually get a combo, which retails for $8. Let's say the average revenue per customer is $7. So then $7 average revenue times 130 is $910 per hour.

The busy period is about 12 hours in length. Multiply 12 times $910 per hour. We get $10,920 during peak hours. Let's say that a typical McDonald's store makes 15 percent of its revenue during off-peak hours. Thus, during the whole day, a typical McDonald's makes $12,847.

Extrapolate that over a year, and a single McDonald's makes $4.7 million.

Now to estimate McDonald's U.S. revenue, we need to factor in the number of stores. I live in Seattle, and there are probably 10 McDonald's stores. Seattle is one of the bigger cities in the U.S. I'd estimate the typical U.S. city has only three McDonald's stores.

As for the number of cities in the U.S., there are 50 states, and each state must have at least 100 cities. That's 5,000 cities. So then 5,000 cities multiplied by three McDonald's stores per city gives us 15,000 McDonald's stores.

Multiple 15,000 by annual revenue of $4.7 million, and we get $70.5 billion per year.

For many companies, like Google, for example, U.S. revenue is approximately half the total revenue. If we use similar assumptions, worldwide revenue for McDonald's is $141 billion.

INTERVIEWER: In 2019, the average McDonald's store makes about $3 million per year. Why do you think your estimate is off?

CANDIDATE: I likely overestimated the number of customers per hour. In retrospect, McDonald's is busiest around lunchtime. I probably should have shaved off the number of customers going into a McDonald's by 20 to 30 percent.

Key Takeaway

Start with the approach. Many make the mistake of jumping straight into the numbers. Starting with the approach helps your interviewer understand where you're headed. Based on what you present, she can provide hints, if necessary.

How many queries per second does Gmail get?

CANDIDATE: Do I get any additional background information?

INTERVIEWER: Nope, that's it. I'm waiting for your number.

CANDIDATE: Okay, I'm going to define a query as a Gmail operation. It could be a read, write, or search operation.

First, I'm going to estimate the number of Gmail users. Then, I'll estimate how often they use the service and how many operations they perform.

INTERVIEWER: Go on.

CANDIDATE: Starting from the top and working my way down, there are approximately seven billion people in the world. Internet usage in developed countries is likely to be in the 70-to-80-percent range.

However, it's much lower for developing countries. So, I'll assume an average of 40 percent. That would mean 40 percent of seven billion people, or 2.8 billion people, use the Internet.

The next number I need is the percentage of people who use Gmail as their primary account. When I think about my friends, I'd say about 70 percent use Gmail as their primary account. I know several who use other services. Given that my friends are more tech-savvy and American-centric than others, let's say worldwide only 20 percent use Gmail as their primary account. That gives us 560 million Gmail primary users.

I log into my Gmail account multiple times a day, but let's say the average Gmail user logs into their account about four times a week. Each time they log in, let's say they read on average eight emails, compose two emails, and search for one email. Thus, the number of queries is:

(4 Gmail logins per week) x ([8 read email operations per login] + [2 compose email operations per login] + [1 search email operation]) = 44 Gmail queries per week per user

CANDIDATE: Finally, to get the number of Gmail queries per second, we do the following math:

(560 million Gmail users) x (44 Gmail operations per week per user) / (1 week per 604,800 seconds) = 40.7 thousand queries per second

CANDIDATE: There are approximately 41 thousand Gmail queries per second.

Key Takeaway

Be prepared to provide your assumptions. It never hurts to ask, but don't be shocked if the interviewer leaves you to supply your own.

How many iPhones are sold in the U.S. each year?

CANDIDATE: For this question, I'd like to start by stating assumptions and then go into running top-down calculations.

Starting with the assumptions:

- There are approximately 315 million people in the U.S.
- 90 percent of people have a cell phone.
- Cell phone users are locked into contracts. That is, they cannot get a new phone unless they pay a penalty to break a contract. The contract is normally two years, so cell phones get replaced once every two years.
- Each person buys one cell phone.
- Smartphones are about 60 percent of new cell phone sales.
- The iPhone has a 40 percent market share of the smartphone market.

Going into the calculations:

The number of people who want to buy a new phone each year is:

- ([315 million people in the US] x [90 percent of people have a cell phone]) x (50 percent will be buying a new phone this year) = 142 million

The number of people who will buy an iPhone each year:

- ([142 million people who will be buying a new phone this year] x [60 percent will get a smartphone]) x (40 percent of the smartphone buyers will buy an iPhone) = 34 million

To conclude, 34 million iPhones are sold in the U.S. each year.

Key Takeaway

Walk the interviewer through your calculations. Estimation questions aren't just a test of your analytical ability. They're an opportunity to demonstrate your communication skills. Make your calculations easy to follow by writing and verbalizing your calculations on a whiteboard.

Estimate how much it costs to run Flickr for a 20 GB user.

CANDIDATE: Just a quick clarification, when you say 20 GB user, are you saying the user is using 20 GB of storage or they bought a plan that provides up to 20 GB storage?

INTERVIEWER: The latter.

CANDIDATE: I assume you want me to calculate the costs of actual usage. That is, if they signed up for a 20 GB plan, they use something less than 20 GB. That's the number you want?

INTERVIEWER: Yes.

CANDIDATE: And you want me to estimate costs per year or month?

INTERVIEWER: Per month.

CANDIDATE: Okay. Let's say that each Flickr user uploads 10 pictures per week.

Each picture is roughly 5 MB in size.

Multiply 10 by 5 MB each. That's 50 MB each week. For the year, that's about 2.5 GB of storage. But what we need is the average cost at any given point in the year. So let's just take the midpoint. Thus, the average user, in their first year, has about 1.25 GB.

Let's talk about storage costs. I'll estimate storage costs to be 10 cents per GB per month. That's roughly how much Amazon S3 charges for storage. We're storing 1.25 GB per user, so multiplying that by 10 cents per GB/month gives us 12.5 cents per month. Per year, that's $1.50 per user.

I've said a lot so far. Any questions?

INTERVIEWER: Nope. You're doing well. Keep going.

From a bandwidth perspective, we usually show the optimized version of the photo. Let's assume optimization can reduce file sizes by 40 percent. So let's say that, rather than the full 5 MB, the user sees a 3MB version.

Assume each picture gets viewed on average 10 times per month. So that's 10 x 3 MB each, so 30 MB gets transferred.

Earlier, we assumed that the user uploads 10 pictures per week. That's 520 photos per year. Let's take the midpoint again, and we get 260 photos. So that's 7.8 GB per month.

Let's say the bandwidth costs are 12 cents per GB per month. If we round our 7.8 GB to 8 GB, we get 96 cents per month per user.

Key Takeaway

Check for comprehension. Your interviewer may not follow your thought process. Check occasionally to see if she's still on the same page.

How many elevators do you need for a 50-story building?

CANDIDATE: You just care about my thought process for this question, right?

INTERVIEWER: Your thought process is important, but I also want you to come up with an actual number.

CANDIDATE: Okay. Give me a moment to collect my thoughts.

The candidate pauses for 30 seconds.

CANDIDATE: I'm going to estimate the number of elevators we need based on how many passengers we need to transport.

To start, I'll estimate how many people use the elevators and how long they're willing to wait. In the elevator industry, it's assumed that people are willing to wait 20 seconds for an elevator. It's also important to know how many people enter the building during peak times. I forgot to ask: is this building for office, retail, or residential use?

INTERVIEWER: This is an office building.

CANDIDATE: If the first part was all about elevator demand, this second part is about elevator capacity. I'd like to estimate:

- How many people can fit in an elevator?
- What's the elevator's average speed?
- How long does an elevator stay open before closing and resuming travel?

It may also be important to know whether there are alternative transportation methods such as stairs or escalators. For the sake of simplicity, we'll set that aside.

Let's assume this is a 50-story office building and that each floor contains 120 employees. In total, that's 6,000 people in a 50-story office building.

People get to work between 8 a.m. and 9 a.m. The 6,000 people arrive uniformly during this 60-minute duration. That's 100 people per minute.

We want people to wait no more than 20 seconds per elevator. On average, 33 people wait 20 seconds.

To determine how many elevators are needed to transport 33 people once every 20 seconds, we need to determine the effective throughput of an elevator.

Let's assume each floor is 12 feet high and the elevator travels 20 feet per second. Let's also assume that in a 50-story building, the elevator stops 12 times on its way up, and each stop takes about 20 seconds.

Let's calculate the numbers. This building is 600 feet tall. At 20 feet per second, it takes 30 seconds to get to the top. However, there are 12 stops on the way up, so that takes 240 seconds. On average, it takes 270 seconds to go up. Let's say it takes half that time to make its way back down in the morning, or 135 seconds. In total that's 6.75 minutes to go up and down per round trip.

Let's say each elevator can contain 10 people. It would take 3.3 elevators to transport the first batch of waiting passengers. And 6.75 minutes will have elapsed before the first set of 3.3 elevators make its way back, so you'll need an additional 67 elevators to service them all.

Just to gut check my solution, Seattle's Columbia Tower has 83 floors, and they have 46 elevators.

Key Takeaways

Judgment matters. Many companies want PMs with good judgment. Choose reasonable assumptions.

Check your numbers. The candidate compared his estimate with Seattle's Columbia Tower. Doing so exemplifies conscientiousness and a willingness to re-evaluate. It adds credibility too.

Chapter 9 Getting Analytical: Pricing

Pricing questions determine whether candidates can diagnose an ambiguous situation, formulate a methodical way of tackling it, and make a hard decision that could make or break an organization.

How to Approach Pricing Questions

When it comes to pricing, the most important number to know is the customer's willingness to pay. For products that are creating brand new categories, this is the price of building a product from scratch. For products that compete in existing categories, this is the competitors' price plus additional accessories or customizations necessary to achieve parity with the competition.

In the real world, trying different price points is the best way to optimize. Out of all retailers, Amazon is known to be the most aggressive in varying its price over time, finding the optimal balance between price and volume.

What if you can't run real-time price experiments like Amazon? You can survey customers instead. Do note that surveys can lead to overly optimistic predictions on price points and volume. Adjust accordingly.

Practice Questions

1. How would you price a new Kindle tablet?
2. Assume you are the new PM for Amazon Prime. The VP would like to lower the price from $79.99 to $69.99 per year. Make your assumptions and develop the financial projections for this decision.

Answers

How would you price a new Kindle tablet?

CANDIDATE: I understand that the new Kindle tablet is a seven-inch tablet with an HD display. I'm not familiar with the tablet market. Do you mind if I ask you a few questions?

INTERVIEWER: Sure, go ahead.

CANDIDATE: Who are its main competitors?

INTERVIEWER: The main competitors are tablets from Apple, Samsung, and Asus.

CANDIDATE: How much do those retail for?

INTERVIEWER: Apple's tablet retails for $329 while the Samsung and Asus tablets sell for $199.

CANDIDATE: What makes the new Kindle stand out from its competition?

INTERVIEWER: The new Kindle has a higher resolution than Samsung's and Apple's.

My last question: How much does it cost to make a Kindle tablet?

I can't release internal data. However, a market research firm, iSuppli, disassembled a Kindle tablet and publicly estimated that each one costs $174 to make.

CANDIDATE: Thanks for the background information. There are three different ways we can look at pricing.

The candidate writes on the board:

- *Customer's willingness to pay*
- *Competitive pricing*
- *Cost-based pricing*

CANDIDATE: First, I'd think about the customer. If they didn't have the product, what would they do instead? How much would they pay for an alternative or substitute product? Negotiators call this the BATNA or the best alternative to a negotiated agreement. Here, I'll call it the customer's willingness to pay for the product. It represents the maximum a customer would pay for the product.

In this case, if a customer couldn't buy a Kindle tablet, the best alternative device would be the Samsung tablet. The Samsung and Kindle have nearly identical specifications, especially screen resolution. The Samsung tablet costs $199, so that likely is the most we could charge for the Kindle tablet.

Next, we would look at Kindle's unit cost of $174. We could add an absolute or relative markup to the unit's final price. Knowing the strategic importance of selling additional digital content via the Kindle, it's possible that Amazon could pursue the "razor and razor blade" strategy. That is, sell the Kindle tablet at, or below, cost, and make its profits on future digital content sales. Given this, let's say the pricing lower bound could be $174.

Then, we would compare prices with what's already on the market. The Samsung and Asus tablets are selling for $199.

Finally, we should evaluate supply and demand. Limited supply and high demand might merit a higher price point while the inverse might merit the reverse. To build a demand curve, we could test different price points. From that data, we could extrapolate the right price to maximize overall product profits.

INTERVIEWER: So, what's your recommendation?

CANDIDATE: Given the urgency, there's no time to experiment and derive a supply and demand curve. Based on the discussion, we've got a pricing range from $174 to $199. I'd suggest the low end of the pricing spectrum, $174.

Amazon needs to protect its core business of selling books, music, and movies. In the digital world, iTunes and Google Play can sell books. By ceding control of the platform, the tablet, Amazon would find it hard to compete. It's more important for Amazon to win market share now and create a strong distribution footprint of tablets. Using the Kindle tablet as a loss leader, Amazon could generate profits on future sales of digital content.

Key Takeaways

Acknowledge critical concepts. The law of supply and demand is an important pricing concept. Although there's no time to build demand curves, you can discuss them qualitatively and bolster your credibility.

Commit. Given all the unknowns, many candidates indecisively waver. Interviewers hate that. Make a sure-footed decision. Good PMs cope with imperfect information.

Assume you are the new PM for Amazon Prime. The VP would like to lower the price from $79.99 to $69.99 per year. Make your assumptions and develop the financial projections for this decision.

CANDIDATE: With lower prices, customer demand would increase. The new Prime customers might also purchase more things. However, increased demand would reduce membership revenues from existing Prime customers and increase shipping costs for existing non-Prime customers. Let's assume there are 5 million Prime customers.

Existing Prime customers

With a $10 price reduction, that would reduce annual revenues by $50 million.

New Prime customers

We need to estimate how many new Prime customers would be gained from the changes. Finally, let's consider additional revenue from the membership, along with incremental sales.

Let's say Prime membership jumps 20 percent due to the price cut. That would be one million new Prime customers. The incremental membership revenue would be roughly $70 million. The average shipping costs per customer would be around $40 per year. Let's say that moving these customers into Prime would increase shipping costs by $20 per year per new Prime customer. That would be an additional $20 million cost.

Finally, we could anticipate more frequent purchases due to free 2-day shipping. Let's say each new Prime customer buys an additional $40 worth of purchases each year. Amazon's gross margins are 25%, so that would be an extra $10 per year per new Prime customer.

To recap on the net annual impact:

Existing Prime customers

-$50 million net

New Prime customers

+$60 million net = +$70 million in member revenue -$20 million in incremental shipping costs + $10 million in incremental gross margin

INTERVIEWER: So, what would the overall change in revenue be, and what would you recommend?

CANDIDATE: Overall, we would be looking at a $10 million annual increase from reducing the price by $10. I would recommend we reduce the price.

Key Takeaway

Re-evaluate the status quo. The pricing change doesn't just affect acquisition; it affects retention (i.e., existing customers) too. Many candidates miss this insight.

Chapter 10 Getting Analytical: Metrics

The Internet has made it simple to conduct A/B tests. These tests allow us to evaluate a new feature's performance with a subset of users. From there, we can more easily infer how that same feature may perform with all users.

Most Agile development processes prefer A/B experimentation over human judgment. Agile development emphasizes iterative development rather than determining requirements upfront and then building the product in a single, final release.

PMs lead the charge with A/B testing, developing new features and hypotheses on what will improve product performance, evaluating test results, and making ship or no-ship decisions on new releases.

The metrics interview reflects this new reality. Interviewers routinely ask individuals which metrics they would evaluate to determine success, how they would interpret test results, and what actions they would take based on the data. With these questions, the interviewer is assessing whether the candidate understands metrics that relate to the overall business goal and whether they can drive the A/B testing process.

Many companies have incorporated metrics questions into the PM interview, with Facebook (FB) being the most infamous. FB calls the metrics interview the "execution" interview. I find it mislabeled. To me, "execution" refers to one's ability to get things done. However, FB uses "execution" to refer to one's "executive decision making" skills.

Examples of Metrics Questions

Typically, interviewers ask metrics questions as a set of four consecutive questions:

Metrics Question Type	Examples
Identifying	You're the PM for ___. Which metrics would you track?
Prioritizing	What's the most important metric?

Diagnosing	___ metric went down X% week-over-week. Why?
Recommending	How would you fix the problem?

The last category of metrics questions revolves around evaluating A/B test data. For instance, the interviewer might say, "LinkedIn is testing a new feature. Here are the A/B test results. Review the data and recommend whether LinkedIn should launch or not launch the feature."

How to Approach Metrics Questions

Question Type: Identifying Metrics

Example: You're the PM for ___. Which metrics would you track?

With this question, interviewers will have metrics in mind. Miss those metrics, and they will judge your answer unfavorably. It's regrettable, but it's human nature.

To protect yourself, brainstorm as many metrics as you can. Even if you miss a few, interviewers will be impressed with your effort and quantity. For instance, if you come up with 20 metrics, interviewers will be more likely to forgive you for missing one or two.

It's easier to brainstorm if you've researched and memorized metrics in advance. To get you started, I've listed some popular metrics for ecommerce, mobile, and enterprise software later in this section.

If you haven't had a chance to research and memorize metrics in advance, the AARM Metrics™ framework can help facilitate brainstorming.

What Is the AARM Metrics™ Framework?

A cquisition
A ctivation
R etention
M onetization

Acquisition is all about signing up customers for a service. The bar for signing up for a service has gotten lower and lower, thanks to the popularity of free signup and pay later "freemium" models. The typical metric to track here is lazy registrations.

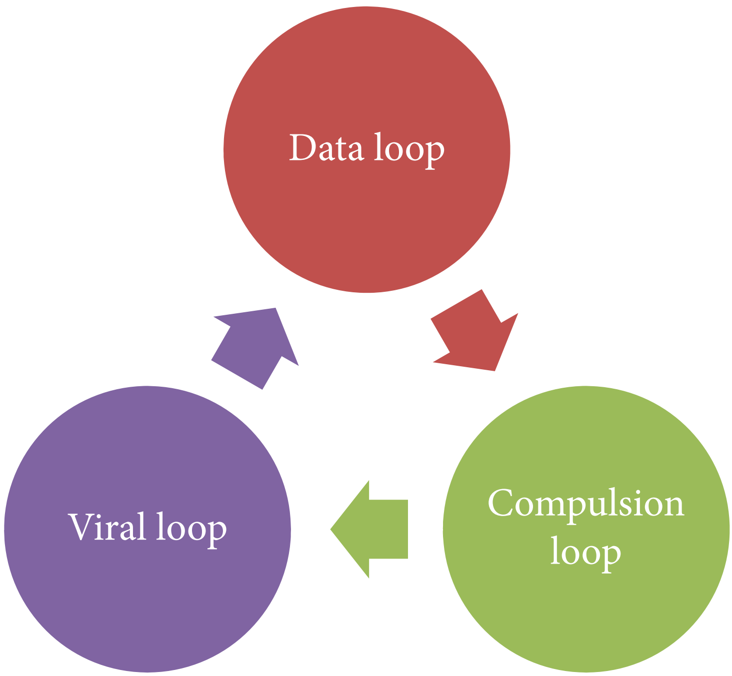
Activation is getting users who have completed a lazy registration to fully register. For a networking site like LinkedIn, this may include a user uploading a photo or completing their profile page.

Retention is getting users to use the service often and behave in a way that helps the user or the business. Here, I use the term retention to include both user engagement and tactics to reduce customer churn. Examples include a user adding more information to their profile page, checking the newsfeed frequently, or inviting friends to try the service.

Monetization is collecting revenue from users. It could include the number of people who are paying for the service or the average revenue per user (ARPU).

Category	Incl. metrics related to…	Example
Acquisition	Signing up	# of app downloads
Activation	Completing the sign-up or onboarding process	# of people who complete the sign-up process
Retention	Engaging with the product and reducing churn	Daily active users, # of posts per user
Monetization	Generating revenue	Lifetime value (LTV), average revenue per user (ARPU)

What Is the Three Loops™ Framework?



The Three Loops™ framework is another tool I use to remind myself of key retention metrics:

1. The **data loop** is about adding more information. For instance, adding a photo or a list of favorite movies is contributing to a social network's data loop.
2. The **compulsion loop** is about checking an application frequently. For example, a video game might ask users to check in throughout the day to see how many new tokens they've earned.
3. The **viral loop** is about inviting friends to try the service. For example, LinkedIn encourages users to invite more connections. Adding connections makes LinkedIn more valuable to the users; it allows them to contact more people and see more profile information. And LinkedIn is thrilled that users serve as ambassadors for their service, reducing their customer acquisition costs.

The Three Loops™ framework also points out how each loop reinforces the others. As a single user adds more personal information to a service, it motivates their friends to check the service more often. When friends see new information, they find the service more valuable, which prompts them to invite more friends. And when those friends join the service, they add more data, beginning the cycle anew.

Common Metrics for Ecommerce Sites

Category	Example
Acquisition	Daily sessions Cost per acquisition (CPA) Cost per click (CPC) Cost per impression (CPM) Top search engine terms leading to the website Mailing list click-through rate Mailing list open rate Mailing list conversion rate Mobile app downloads
Activation	New registered users Mobile app opens Number of searches on website or app New cart started User information given (address, credit card, etc.) New customers with a successful purchase
Retention	Conversion rate Recommendation engine conversion rate Shopping cart abandonment Shopping cart size Visits from activated users per month
Monetization	Revenue per customer Lapsed customers Purchases per year Revenue per click Cost of sale (ad spend / revenue) Customer lifetime value (CLV) Cost of shipping
Other	Average listing position on the Google search results page for the most important keywords Cost of goods sold Shipping time Stockouts Returns Checkout errors

	Number of reviews left by customers Viral coefficient (number of users that each customer refers) Market share Customer engagement on social media Net or gross margin

Common Metrics for Mobile Applications

Category	Example
Acquisition	Number of mobile installs Cost per install
Activation	Number of accounts created, after mobile download
Retention	Daily and monthly active usage Time in-app Star rating Session length Percentage of users who rate the app
Monetization	Percentage who are paid users Lifetime value Average revenue per user Churn

Common Metrics for Enterprise Software

Category	Example
Acquisition	Leads Virality
Activation	New registered users
Retention	Daily active usage Time on-site Interval between logins Churn
Monetization	Conversions Deal size Renewal rate Monthly recurring revenue Revenue per user Revenue per lead LTV
Other	Uptime

Question Type: Prioritizing Metrics

Example: What's the most important metric?

With this question, interviewers are testing your judgment as you choose a single metric. It's easy to do the opposite: track dozens of metrics and lose focus. Interviewers also want to assess your ability to defend your opinion.

When approaching this question, identify a shortlist of two or three potential metrics you'd consider to be the "success" metric. Use a table to discuss the strengths and weaknesses of each and then make your final recommendation.

Question Type: Diagnosing a Metric

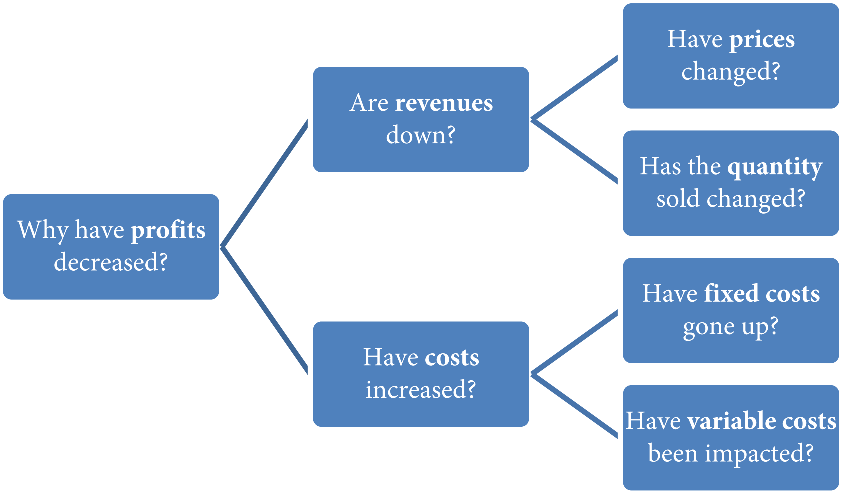
Example: ___ metric went down X% week-over-week. Why?

Interviewers are looking for proactive candidates who can tackle an ambiguous problem and determine the root cause by developing hypotheses.

Approach this question by drawing an issue tree first. Then systematically explore each issue. Finally, deduce the issue by the process of elimination.

Tip: Draw an issue tree

An issue tree is a graphical representation of issues that impact the main problem or question. The most recognizable issue tree is the profitability tree:



This issue tree answers the question: what issues affect a profit drop?

Using an issue tree makes one's answer more:

1. **Satisfying**. An issue tree, especially a detailed one, feels like a more complete and exhaustive diagnosis.
2. **Accurate**. An issue tree is a checklist. A checklist can save you from missing a critical issue.
3. **Logical**. The tree organizes sub-issues under a single branch, making your diagnosis logical and easy to follow.
4. **Archivable**. The interviewer can copy or photograph your issue tree diagram, which they can reference when writing interview notes.

Constructing a detailed, organized issue tree is not easy. Here are a few tips:

- **Don't agonize.** Organizing issues into a tree structure can be hard. If it helps, list issues into a bulleted list. Then organize those issues into a tree. If you're running out of time, skip the tree; a bulleted list is fine.

- **Reuse existing issue trees**. Save time by leveraging existing issue trees. You can find dozens of issue trees in *Interview Math* and *The Product Manager Interview*.
- **It's not a decision tree**. Your issue tree shouldn't have chance, decision, or end nodes; those belong on a decision tree. By getting issue and decision trees mixed up, you'll belie your experience.

Question Type: Recommending a Solution

Example: How would you fix the problem?

Once you've isolated the issue, most interviewers expect a solution. This is another opportunity for you to brainstorm.

Creativity and quality count. Propose three solutions, discuss the pros and cons of each, and then make a single recommendation without hedging.

Tip: Making Decisions Based on A/B Test Results

Ideally, we would run A/B test experiments for win-win situations. For example, it would be amazing if a new feature was found to increase revenue by five percent and seven-day logins by three percent. However, the real world often requires us to make win-lose trade-offs. For instance, a new feature increases revenue five percent, but 30-day logins decrease by three percent. What should a product manager do?

When faced with this dilemma, make the decision that's in line with the corporate strategic goal. Ask the interviewer, "What's the current objective?" For instance, if the boss is desperate to meet a quarterly profit goal, choose the feature that maximizes revenue at the expense of engagement.

Practice Questions

1. What metrics would you look at to evaluate LinkedIn's success?
2. What's the most important metric you'd track?
3. Let's say the metric you chose went down X% week-over-week. Diagnose what happened.

4. Now that you've diagnosed it, how would you fix the problem?
5. Review this A/B test result. What would you do?
6. Suggest a killer feature to improve LinkedIn. What metrics would you track to determine success?

Answers

What metrics would you look at to evaluate LinkedIn's success?

Activation

- New user registrations
- Mobile downloads

Retention and Engagement

- Users who complete signup
- Usage: 1-, 7-, and 30-day
- Time on-site
- Interval between logins
- Content posted (e.g., newsfeed updates and articles)
- Flagged content
- # of invites sent
- Private messages sent
- Average number of connections
- Lapsed users

Monetization

- Conversions from free to paid usage
- Average revenue per user
- Monthly recurring revenue
- Monthly subscription cancellations
- LTV
- CAC

Other

- Uptime
- Net promoter score

Key Takeaway

Use frameworks. Kickstart your brainstorming with AARM™. It'll increase your chance of coming up with a complete and satisfying answer.

What's the most important metric you'd track?

INTERVIEWER: That's a long list of metrics. Of those metrics, which metric is the most important one to focus on?

CANDIDATE: Is the company focused on growth or revenue?

INTERVIEWER: What's your guess?

CANDIDATE: LinkedIn has been around for more than 10 years. I imagine the business goals and metrics have evolved over the years. In the early days, it made sense for the company to focus on user growth because of network effects. That is, LinkedIn is more useful when I have 200 contacts on the platform vs. two.

Later, LinkedIn needed to prove that it could monetize its sizable user base. Now, as part of Microsoft, revenue no longer appears to be the primary concern. Instead, Microsoft wants to make LinkedIn an indispensable part of your workday. It doesn't matter to Microsoft if you're accessing LinkedIn through the mobile app, Microsoft Office, or Microsoft's CRM suite. They want LinkedIn to be a central part of your office time.

INTERVIEWER: Your intuition is correct. Continue.

CANDIDATE: So, to recap, we're going to set aside user growth and revenue in favor of engagement. Three engagement metrics come to mind:

- Usage: 1-, 7-, and 30-day
- Time on-site
- Interval between logins

There are pros and cons to each, so let me run through them quickly.

The candidate writes the following on the whiteboard:

Metric	Pros	Cons
Usage: 1-, 7-, and 30-day	Would measure engagement frequency Would infer need (craving) for service	Wouldn't measure engagement quality
Time on-site	Would infer quality of engagement	Wouldn't measure engagement frequency Could be imperfect
Interval between logins	Would measure engagement frequency Would infer need for service	Wouldn't measure engagement quality

CANDIDATE: Of these options, I'd recommend time on-site. It speaks specifically to the quality of engagement whereas the other two do not.

INTERVIEWER: I agree that quality matters more than quantity. I noticed that you mentioned that time on-site could be an imperfect metric. Can you tell me more about that?

CANDIDATE: Time on-site is an approximation. Most analytics applications derive time on-site by taking the difference between the last and first pages visited during a session. As you can imagine, there are many loopholes with this calculation. For example, what is the time spent for a user who visits one page and leaves?

Another imperfection is user behavior. Let's say a user opens the first page, leaves for the night, and triggers a page view the next day? Analytics software shouldn't include time away from the computer.

INTERVIEWER: How can we mitigate those flaws?

CANDIDATE: We could improve the metric's accuracy by having the application monitor events on a page. For example:

- Monitor whether a user scrolled or clicked a button.
- Show a popup that asks, "Are you still there?"

INTERVIEWER: That makes sense. Thank you.

Key Takeaway

Minimize your risk. While the interviewer specifically asked for one metric, you run the risk of choosing the one she wasn't looking for. Protect yourself by starting with a shortlist of three metrics and then narrowing it down to one.

Let's say the metric you chose went down X% week-over-week. Diagnose what happened.

INTERVIEWER: Let's say LinkedIn's time on-site decreased seven percent week-over-week. Diagnose what happened.

CANDIDATE: Is the decrease related to location, operating system, or browser?

INTERVIEWER: No.

CANDIDATE: Any differences from a demographic perspective?

INTERVIEWER: Location, demographics, and technology platform are good points, but let's set those aside. I'd like you to focus on user behaviors.

CANDIDATE: Got it. As a user, I imagine the three most popular LinkedIn behaviors are viewing profiles, reading the newsfeed, and searching for people.

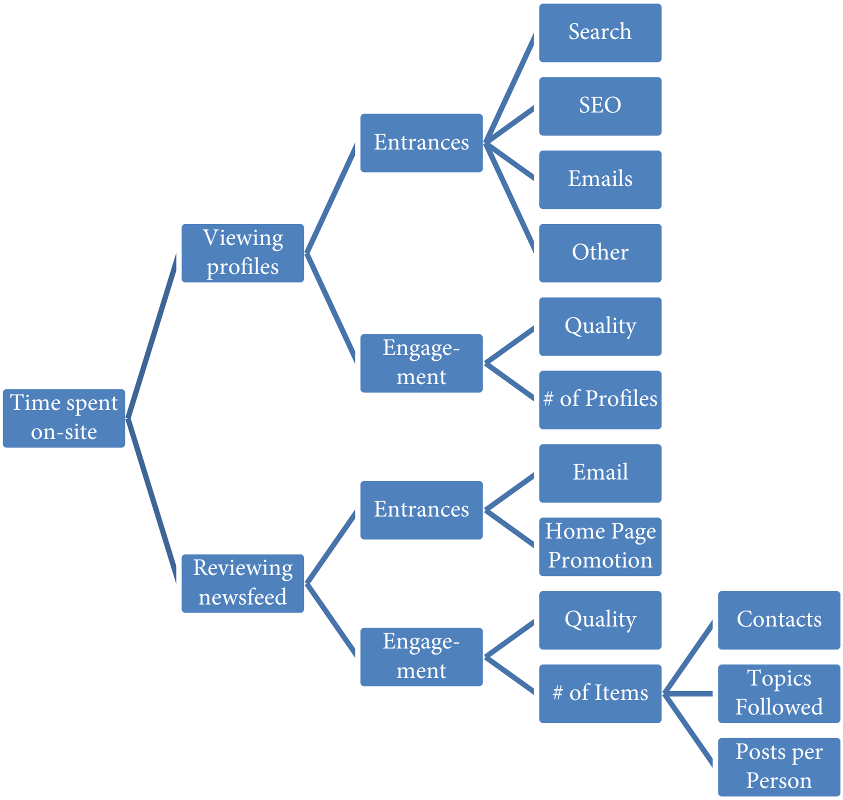
INTERVIEWER: People searches do happen quite frequently for our recruiter persona. But for non-recruiters, people searches don't happen as often as everyone thinks. So, why don't we focus on viewing profiles and reading the newsfeed?

CANDIDATE: Okay, let me sketch out an issue tree. I'll use it to explain why profile and newsfeed viewing can affect our time spent on-site.

INTERVIEWER: Sounds good.

The candidate draws the following issue tree on the whiteboard:

(Space left blank intentionally)



INTERVIEWER: Walk me through the "viewing profiles" branch.

CANDIDATE: Both entrances and engagement can affect time spent on-site. When it comes to entrances, people may arrive at a profile page through a search within the LinkedIn site or via Google, which we call SEO. Users may also view profiles by clicking on names listed in a newsfeed.

INTERVIEWER: How about the engagement branch?

CANDIDATE: Naturally, a user can't view a profile if it doesn't exist.

INTERVIEWER: So why would that decrease time on-site?

CANDIDATE: Let's say LinkedIn conducted a cleanup campaign to delete fake profiles. If millions of fake profiles suddenly disappeared from the site, users would naturally spend less time on-site.

INTERVIEWER: Got it. Let's say the internal analytics team has helped narrow down your hypotheses. They've determined that time spent on-site viewing profiles has decreased via the SEO channel. Why do you think this is?

CANDIDATE: Are we seeing any differences in in-bound SEO traffic? Volume differences? Mix shifts like differences in audience or referrer quality such as Google vs. Bing?

INTERVIEWER: Good hypotheses, but let's say there aren't any third-party changes.

CANDIDATE: Have we done something differently on our side? Perhaps changed the UX for visitors coming in through SEO channels?

INTERVIEWER: Yes.

CANDIDATE: Can you tell me more?

INTERVIEWER: We've instituted a tighter login wall. All users must log in to view any profile.

CANDIDATE: Ah, that must be the reason for the decrease in time on-site.

INTERVIEWER: You got it.

Key Takeaway

Draw an issue tree. Not only is it an attractive visual, but it also offers an organized checklist for you to pinpoint the problem.

Now that you've diagnosed it, how would you fix the problem?

INTERVIEWER: So how would you fix it?

CANDIDATE: I've got a couple of ideas in mind. Before I go through them, I want to ask a clarifying question: what was the reasoning behind the login wall in the first place?

INTERVIEWER: Originally, we implemented a login wall because we wanted to drive new user signups. However, user growth is not the primary focus these days. We're more concerned with third parties trying to scrape our content.

CANDIDATE: Got it. Give me a moment to brainstorm a couple of solutions.

The candidate writes the following on the whiteboard:

Solution	Pros	Cons
Remove login wall	Would increase time spent on-site	Would make site susceptible to scrapers
Implement a simpler login wall	Would decrease impact on time-spent metric	May not be enough to deter scrapers
Implement a CAPTCHA wall	Would decrease impact on time-spent metric Would be a more effective deterrent against scrapers	Could frustrate visitors
Implement an IP address-based login wall	Would increase time spent on-site Wouldn't frustrate users Would be a more effective deterrent against scrapers	Loopholes may occur
Utilize digital fingerprinting	Would increase time spent on-site Would be a more effective deterrent against scrapers Wouldn't frustrate users	Could increase error rate

INTERVIEWER: That's a good list. Can you tell me more about the last two?

CANDIDATE: Third-party scrapers use a finite set of servers to scrape sites. For example, they might spin up an AWS server to do the scraping. These servers rotate among a set of IP addresses. We could create a blacklist of IP addresses that have abnormal user activity. We could also whitelist IP addresses with normal activity.

INTERVIEWER: That makes sense. How about the last idea?

CANDIDATE: Digital fingerprinting is a way to uniquely identify web visitors. Any website can poll a user's system configuration including screen size and installed fonts. Based on that information, websites can uniquely identify a user with 95%+ accuracy.

INTERVIEWER: So which idea would you recommend?

CANDIDATE: Of these ideas, I like digital fingerprinting the most. It would revive our time on-site metric and work unobtrusively in the background. It would also ward off the web scrapers. The privacy implications would be a bit creepy; however, I wouldn't expect any PR issues because most online users understand that complete anonymity on the Internet is not 100% possible.

Key Takeaway

Clarify the goal. By understanding the intent of the login wall (driving signups vs. deterring web scrapers), the candidate could focus his brainstorming activity around solutions for the latter.

Review this A/B test result. What would you do?

INTERVIEWER: LinkedIn is testing a new feature: asking a new user to upload their profile photo during the sign-up phase. Currently, a new user is asked to upload a profile photo after the sign-up process.

The experimentation team ran a two-week A/B test for the new feature. Review the data. Make a recommendation on whether we should launch the feature or not.

	Lift	P-Value
Number of users completing signup	-13.21 percent	0.02
Profile completeness	+1.65 percent	0.01
Number of users who posted	+2.11 percent	0.05
Number of posts	+4.85 percent	0.01
Number of invites sent	+2.36 percent	0.02
1-day retention	+2.12 percent	0.07
7-day retention	+1.08 percent	0.20
30-day retention	N/A	N/A

CANDIDATE: On one hand, engagement has gone up significantly. Increases in the following metrics are remarkable:

- Number of users who posted
- Number of posts
- Number of invites

The slight increase in profile completeness is a good sign too.

On the other hand, there's a double-digit drop in the number of users completing signup.

INTERVIEWER: Okay, so would you launch this feature or not?

CANDIDATE: It depends on the company's goal. Is it more important to get more users? Or is it more important to get engaged users?

At this stage, I feel it would be more important to get engaged users.

INTERVIEWER: So that's your final answer? Launch the feature?

CANDIDATE: Instead of launch vs. no-launch, I'd like to explore two additional options:

- **Run the test for a longer duration**. We might see more statistically significant data for 7- and 30-day retention.
- **Try a different design**. It could very well be that the strategy is correct, but the implementation could be improved.

INTERVIEWER: Sounds like a good plan. One last question: why did we show the p-value column?

CANDIDATE: P-value is a measure of whether the results are statistically valid. That is, with a sufficient p-value, we know that the results can't be explained by something other than the feature changed specified in the A/B test. Typically, I am comfortable accepting data with a p-value of less than .05.

Key Takeaways

Be comfortable with win-loss features. Not every feature is a win-win. Features often have trade-offs. Good PMs can rationalize the path forward even when it isn't clear to others.

Don't settle for the options presented. The interviewer presented only two options: launch or not. In this case, there are additional options including trying a different design or running the A/B test experiment for a longer period.

Decisions depend on the context. Once again, the goal matters. A decision that might make sense for one goal (e.g., user growth) might not make sense for another (e.g., engagement).

Suggest a killer feature to improve LinkedIn. What metrics would you track to determine success?

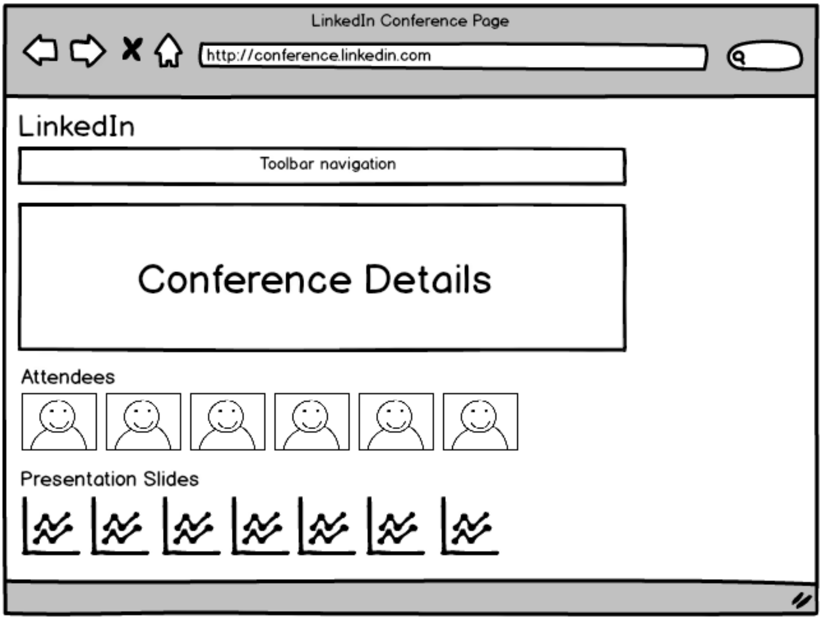
CANDIDATE: There are a lot of different reasons people use LinkedIn. Professionals look for jobs and career development opportunities. Recruiters look for new candidates. Salespeople look for new contacts.

For me, the persona that resonates most is the professional. I'm always searching for conferences and courses focused on professional development. That's the scenario I'd like to explore.

INTERVIEWER: Go ahead.

CANDIDATE: When I think about the conference scenario, I think of three use cases:

1. As a potential conference attendee, I want to find new conferences that I can attend.
2. As a conference attendee, I'd like to see who else is attending the conference so that I can keep a list of people to network before, during, and after.
3. As a conference attendee, I'd like to access conference materials easily.



So, here's my solution: a conference page hosted on LinkedIn. It would have conference details, such as event name, date, location, cost, and links to the conference agenda.

Right below it would be registered attendees. Users could click to contact them via LinkedIn's messaging system. And below that would be links to pre- and post-conference slide material.

LinkedIn's revenue opportunities with this new conference page could include:

- Conference organizers pay monthly subscription fees
- Get revenue share on all conference fees
- Collect a small transaction fee on all registrations

INTERVIEWER: Interesting. Let's talk about getting conference details data. How would you do it?

CANDIDATE: Three ideas come to mind:

1. Conference organizers could post details manually.

2. LinkedIn could build a crawler to index the web and parse conference data.
3. LinkedIn could define a conference data format and have conference organizers upload the data to LinkedIn, either in a text file or a server-to-server API call.

INTERVIEWER: How would you determine if this new feature was successful?

CANDIDATE: There are a couple of metrics I would consider:

- **Acquisition.** How many conference organizers signed up for the service? This measure would tell us whether the feature was compelling and worth spending time on.
- **Engagement.** Of the conference organizers who signed up, how many conference pages did they create? How often? And for the conference attendees, how often did they visit the site? What kind of positive behaviors did they undertake, whether it was contacting or connecting with other conference attendees or downloading presentation materials? We would want the feature to add value to both organizers and attendees.
- **Monetization.** Last, how much money was LinkedIn making? They wouldn't want to waste time working on something that was not contributing either short- or long-term revenue potential.

Key Takeaways

Mix and match frameworks. This question is a combination of product design and metrics. The sample answer combines the CIRCLES™ and AARM™ frameworks seamlessly.

Chapter 11 Strategizing: Trade-offs

When it comes to strategy, the most prevalent and satisfying analysis tool is pro/con analysis. As the name implies, it's satisfying because it feels objective. How can something not be objective if you evaluate both the positives and negatives? It also feels complete.

Evaluating the pros and cons of an idea, across three-to-five different dimensions, can easily consume two-to-four minutes.

Practice Questions

1. Amazon launched display advertisements on its web page, and it was a highly controversial decision within the company. Pick either the pro or con side of the argument and explain your position for or against including ads on the site.
2. Now tell me why display advertising is a bad decision.

Answers

Amazon launched display advertisements on its web page, and it was a highly controversial decision within the company. Pick either the pro or con side of the argument and explain your position for or against including ads on the site.

CANDIDATE: Give me a moment to think about this.

The candidate takes 30 seconds.

CANDIDATE: Launching Amazon display advertisements is a good decision, and there are two reasons:

It improves the customer experience. Advertisements can minimize negative customer experiences and possibly enhance a customer experience. Let's say a customer was intent on buying a product, but Amazon is out of stock. The customer was going to leave the site anyway.

Amazon can direct the consumer to a competitor that does have the product, enhancing the customer experience. Alternatively, advertising can highlight special offers, enhancing the Amazon shopping experience.

It provides additional revenue. Advertisers will pay Amazon to achieve their business goals. For instance, manufacturers might want to increase awareness, increase upsell, or shift share away from competitors' products.

There's even an opportunity to sell ads to Amazon's competitors. Amazon's competitors may be too happy to meet an Amazon customer's unmet purchase needs.

The latter case may feel bizarre, but there is a revenue opportunity, along with an opportunity for improved customer satisfaction. This revenue can be used to further invest in the Amazon customer experience.

Key Takeaway

Beware of jargon. Two researchers, Jochim Hansen and Michaela Wänke, arrived at an important insight: listeners found statements that don't contain jargon to be more truthful and credible than statements that do. This makes sense. Those who use jargon and imprecise language appear to have something to hide.

Now tell me why display advertising is a bad decision.

CANDIDATE: Launching display advertisements on Amazon is a bad decision, and here's why:

It distracts customers from purchasing products. Ads can clutter the customer experience. For example, it may be harder for the customer to find what they want. In the short-term, it could lead to increased bounce rates, more abandoned shopping carts, and reduced conversions. In the long-term, it could lead to fewer repeat visits as customers search for shopping alternatives that are less cluttered and frustrating.

It creates a negative brand perception. Over time, customers could notice that Amazon repeatedly refers customers to other retailers. Rather than come to Amazon as their first shopping destination, they may choose to go to those retailers first. This could allow a competitor to establish its reputation as the first place to find and research products they need.

Key Takeaway

Strong opinions weakly held. This is a common follow-up question to the previous question. The interviewer is checking how quickly a candidate can abandon his previous position, take a new position, and identify the right arguments for the opposing view. It's testing whether a candidate can see both sides of an issue, adapt to change, and leave behind a preconceived notion of what should have been done. (Kaitlin, I inserted a paragraph break here.)

According to Jason Fried, Jeff Bezos "observed that the smartest people are constantly revising their understanding, reconsidering a problem they thought they'd already solved. They're open to new points of view, new information, new ideas, contradictions and challenges to their own way of thinking."

Chapter 12 Strategizing: New Market Entry

How to Approach Strategy Questions on New Market Entry

Run through the following checklist when answering questions about new markets. It offers tangible criteria the interviewer can use to agree or disagree with your assessment. The checklist also ensures that nothing is left off your analysis.

New Market Entry Checklist

Market characteristics

- Market size
- Market growth
- Profit margins
- Market trends, including changing customer preferences and regulatory changes

Competitive environment

- Number of competitors
- Competitor's resources, including financial, employees, and partner ecosystem
- Competitor's unique competencies, including differentiated products and access to distribution channels

Company fit

- Expertise
- Economies of scale
- Access to distribution channels
- Good relationships with suppliers
- Related to the existing brand promise

Practice Questions

1. You have a choice between selling a new oven or an oven mitt. Which one would you choose, and why?
2. An aspiring Amazon product manager proposes to Jeff Bezos that Amazon should sell groceries from neighborhood markets. What are the pros and cons of this idea?
3. Start a new category, division, or international market for Amazon. Which one did you choose, and why?

Answers

You have a choice between selling a new oven or an oven mitt. Which one would you choose, and why?

CANDIDATE: My understanding of the scenario is that I'm an Amazon category manager, responsible for the kitchen category. I must choose which new product to carry – a new oven or oven mitt.

INTERVIEWER: Yes, that's correct. Choose one; you can't have both or something else.

CANDIDATE: Let me walk you through how I would frame the issue and then dive into the details.

INTERVIEWER: Sounds good.

CANDIDATE: There are three criteria I think about when stocking a new product.

The candidate writes the following on the whiteboard:

- *Profitability*
- *Customer satisfaction*
- *Product assortment*

CANDIDATE: To begin, profitability is straightforward. Usually, it doesn't make sense to go through the effort, cost, and time to stock a product if we're not going to make money.

Second, customer satisfaction is important. We want customers to have a good experience. They will be disappointed if they can't find a product. This affects the net promoter customer satisfaction metric.

Moreover, Amazon should recommend high-quality products. Amazon wouldn't want to endorse, let alone carry, products that don't work as advertised or provide a reasonable value to customers.

Third, product assortment is crucial, especially as it relates to corporate strategy and branding. Amazon's value proposition is product assortment. Amazon started by promoting itself as the world's largest bookstore and now, rightfully so, the world's largest store, period.

If customers expect Amazon to stock an item and that item isn't available, it damages Amazon's brand equity. It affects customers' desire to come back in the future as well as their willingness to recommend Amazon to friends. I know Amazon doesn't focus much on traditional marketing, choosing instead to let the consumer experience speak for itself; a negative customer experience would be detrimental.

Is there anything missing from my decision-making framework?

INTERVIEWER: I can't think of anything else off the top of my head.

The candidate writes on the whiteboard:

	Oven	**Oven Mitt**
Annual profit contribution	$XX million	$YY million
Increase in customer satisfaction	Carrying the oven <increases / decreases> cust. sat. because _______	Carrying the oven mitt <increases / decreases> cust. sat. because _______

Improvement in product assortment	Carrying the oven <increases / decreases> prod. asst. because _______	Carrying the oven <increases / decreases> prod. asst. because _______

INTERVIEWER: Okay, I like what you've written. Let's start with the qualitative ones first – customer satisfaction and product assortment.

CANDIDATE: Okay. Does Amazon carry any ovens today?

INTERVIEWER: No. We carry small toasters, but we do not carry large kitchen ovens. Why do you think that is?

CANDIDATE: I hypothesize that consumers aren't comfortable buying large appliances online. They are used to going to Sears, Best Buy, and Home Depot to buy appliances in person. However, I do think the world is changing. I bought an oven three months ago, and I bought it from Best Buy's website after seeing it listed for more at Home Depot.

INTERVIEWER: Ah, showrooming.

CANDIDATE: Yes.

INTERVIEWER: Aside from consumer behavior, why else would Amazon not carry kitchen ovens?

The candidate thinks for a moment.

CANDIDATE: I can come up with two more reasons Amazon doesn't carry kitchen ovens today. First, because of its bulky nature, an oven isn't easy to deliver, especially in Amazon's highly optimized fulfillment operation that had its roots in delivering more manageable items, such as books, DVDs, and movies.

INTERVIEWER: Correct. What else?

CANDIDATE: Amazon also might not sell ovens because that is more a solution-sell, not a product-sell.

INTERVIEWER: Sounds like jargon to me. What does "solution-sell" mean?

CANDIDATE: Well, the customer is not just buying an oven; he wants a working oven. To sell a working oven, Amazon would have to provide installation services as part of the sell. Home Depot and Best Buy have developed relationships with local service providers who not only deliver kitchen ovens but also have the expertise to install them. Amazon would have to develop those business relationships on a nationwide scale.

INTERVIEWER: Based on your findings, what would you put in the customer satisfaction section of your scorecard, for the new oven?

CANDIDATE: I would put "decrease" customer satisfaction. We could carry ovens and make them available for sale. However, we couldn't fulfill ovens quickly, which is what customers expect from us. Also, we'd have a hard time offering the services that go along with big appliance purchases from day one.

INTERVIEWER: Sounds good. We're running short on time. I want us to cover one last thing before we move on to the next question.

CANDIDATE: Sure.

INTERVIEWER: I'd like you to calculate the expected profits from carrying the oven mitt.

CANDIDATE: You want an actual number estimate?

INTERVIEWER: Yes.

CANDIDATE: And when you say profits, do you mean annual or lifetime?

INTERVIEWER: Annual.

CANDIDATE: I'll talk about my approach, and then we'll go into some back-of-the-envelope calculations. I'll start by looking at the potential customer base, the likelihood of purchasing an oven mitt at Amazon, the frequency of purchase, and the propensity to purchase a particular model. And of course, I'll also factor in the profit margin.

INTERVIEWER: Sounds good.

CANDIDATE: Last time I checked there are 315 million people in the U.S. I'm going to guess there are roughly 2.5 people per household. To save time, we'll round the numbers to 300 million and three, respectively. This will give us 100 million households.

Most households need one oven mitt. Some need more than one, but let's say one is enough.

For this year, two customer segments would be interested in oven mitts. The first customer segment is households that have never owned an oven mitt. The second customer segment is households that want to replace an oven mitt.

Let's start with the first segment. Those who are starting households are usually new college grads. If we assume a uniform distribution along with a 70-year life expectancy, we'll get:

The candidate writes down:

300 million people / 70-year life expectancy = 4.3 million new people starting a household each year

CANDIDATE: Of those 4.3 million people, not everyone will get an oven mitt. Some think they need it, some don't. Some have one from mom and dad. What's a reasonable assumption for the percentage of new grads who need an oven mitt?

INTERVIEWER: Go with 60.

The candidate writes down:

*4.3 million * 60% = 2.6 million*

CANDIDATE: Okay, that's 2.6 million people who are going to buy an oven mitt.

Next calculation: what percentage buy from Amazon? What do you think is Amazon's market share of oven mitt purchases?

INTERVIEWER: What do you think it is?

CANDIDATE: It seems that most people buy housewares from Target and other big-box retailers, so I'd say it's less than 5 percent. However, younger people like buying through Amazon, especially with free shipping and Prime. I'd go with a higher number, like 15 percent.

INTERVIEWER: Sure.

The candidate writes down:

*2.6 million * 15 percent = 390 thousand*

CANDIDATE: Of those 390 thousand people, I'll assume they only need one oven mitt. For these folks, how many would buy this oven mitt? Is there anything special about the oven mitt that leads us to believe that it would get a disproportionate number of sales?

INTERVIEWER: Initial tests show that it outsells the average oven mitt by 3:1.

CANDIDATE: How many oven mitts do you carry?

INTERVIEWER: 2,000.

The candidate writes down:

390 thousand / 2 thousand = 195 units per average mitt

*195 avg. units * 3 = 585 units sold for this mitt, per year*

CANDIDATE: So, we would expect to sell 585 mitts this year. What's the unit contribution for each mitt?

INTERVIEWER: $4.

The candidate writes down:

*585 units per year * $4 = $2,340 annual profits*

CANDIDATE: From a profit perspective, carrying this mitt will bring us $2,340 in annual profits.

INTERVIEWER: We're running out of time. Based on what you know, does it make sense to carry the oven mitt?

CANDIDATE: Amazon already carries 2,000 mitts, so it's hard to argue that customers are unsatisfied with the current set of choices or find the product selection lacking.

The $2,340 in annual profits is nice, but there may be some cannibalization. Cannibalization concerns aside, along with any upsell/cross-sell considerations, I would only go for the $2,340 in annual profits if it wouldn't require any additional work, such as starting a new vendor relationship.

Key Takeaways

Crunch the numbers. When choosing between two options, it's not apparent that the interviewer wants the candidate to do the math. However, it's not only a convincing way to make your case but also a way to demonstrate a skill they're looking for in strong PM candidates: analytical ability. Don't be afraid to do back-of-the-envelope calculations.

Maintain your stamina. Some questions can be longer than others. Don't wilt. Be resolute. And don't assume that the interviewer will provide water and snacks during the day. Bring your own!

An aspiring Amazon product manager proposes to Jeff Bezos that Amazon should sell groceries from neighborhood markets. What are the pros and cons of this idea?

CANDIDATE: I want to make sure I understand the concept fully. A customer could go to the Amazon website, purchase groceries, and then collect them from a local supermarket?

INTERVIEWER: That's correct. Their purchases would be picked and waiting for them within 30 minutes.

CANDIDATE: And when we say a local supermarket, you're referring to supermarkets that aren't owned by Amazon?

INTERVIEWER: That's correct. Amazon would make its competitors' inventory available to Amazon customers.

CANDIDATE: Partnering with Amazon's competitors seems odd to me.

INTERVIEWER: Amazon doesn't mind cooperating with its competitors.

CANDIDATE: Okay. Give me a moment to collect my thoughts.

INTERVIEWER: Sure.

The candidate pauses for 20 seconds.

CANDIDATE: Here are the customer benefits I envision:

- **Amazon shopping experience**. Users can benefit from product details, inventory availability, reviews, and forums.
- **Lists**. Users can save their most commonly purchased items.

- **Fulfillment speed**. Customers can get products within a one-hour time window.

INTERVIEWER: Good. What would be the benefit to Amazon?

CANDIDATE: Amazon would get the following benefits:

- **Improved customer experience.** Amazon can get products in customers' hands much faster.
- **Reduce costs**. Amazon can save on shipping fees.
- **Make money**. Amazon could get a cut of the transaction for driving more business to local supermarkets.

INTERVIEWER: Okay, there's a lot of upside in this plan, both for customers, Amazon, and local stores. What do you anticipate the top three issues to be?

CANDIDATE: Here's what I think the top issues would be:

1. **Signing up local stores**. Amazon doesn't have relationships with local stores today. Amazon would have to spend considerable effort in signing up stores. It might be a while before Amazon could build a significant local store network.
2. **Local store integration**. Many of the local stores could have trouble integrating with Amazon's ordering systems. Many local stores might not have technical know-how or time for integration.
3. **Quality risk**. The local store's products might not be the same quality that customers expect from Amazon.
4. **Inventory data**. For this idea to succeed, Amazon would need to report accurate inventory data from local supermarkets. It would be very frustrating for customers if a product was reported as available but was not.

5. **Inventory availability**. Amazon could aggregate so much demand. Local stores might not have the inventory to fulfill the orders.
6. **Competitive risk**. Customers could bypass Amazon and buy directly from the local merchant in the future.

INTERVIEWER: You're an overachiever, huh? I like that. So out of your list of six items, what do you think is the biggest risk?

CANDIDATE: All of the items sound challenging. However, I think inventory availability is the biggest risk. It's hard to forecast the demand for a product. I don't think local stores could scale inventory as quickly as Amazon would need, especially with the customer traffic Amazon could send to stores.

Key Takeaway

Stay tough mentally. The interviewer called the candidate an "overachiever." Some candidates might laugh uncomfortably at her blunt labeling. Attempting to deduce your interviewer's quips or body language can distract you, affecting interview performance.

Start a new category, division, or international market for Amazon. Which one did you choose, and why?

CANDIDATE: I would start a dollar store category for Amazon. It would be a good fit for the following reasons:

Growing market	5-7 percent annual growth
Good gross margins	30-40 percent vs. Amazon's 20-28 percent
Attractive customer segment	22 percent of dollar store customers make $70 thousand+ per year

Consistent w/ strategy	Dollar store improves product selection
Low barriers to entry	Amazon likely has relationships with dollar item manufacturers already
Synergies	Physical products can utilize Amazon's superior fulfillment capabilities
Credible differentiation	Dollar store value without the driving and the slimy store experience

Today, I see Amazon dabbling with dollar store items. Sometimes, there are some dollar items available for sale, but not the breadth that I'd see at a brick-and-mortar dollar store. Other times, I see dollar store items such as baking soda marked up 400 percent by Amazon's marketplace vendors.

With the new add-on program, Amazon would be acknowledging that selling low-priced items can be profitable; it just can't be profitable (or provide enough customer value) when the products are sold and shipped on their own.

The dollar store would work under the "fill your bag" principle. That is, buy enough $1 items to fill a minimum quantity, and you'll get Amazon's free super saver shipping. By aggregating several $1 items in a single shipment, Amazon could make these dollar items profitable.

Key Takeaways

Prepare in advance. It's difficult to identify a new category on the spot. Amazon appears to sell everything. To counter, brainstorm new ideas before your interview. It'll increase your chance of coming up with a unique idea and a thoughtful answer. Here's a hint: Amazon today doesn't sell products that are unusually bulky, perishable, or illegal.

Leverage the company's capabilities. The best business opportunities are those that leverage a company's existing assets. This includes Amazon's:

- Brand
- Customer base
- Merchandising platform
- Fulfillment infrastructure

Chapter 13 Strategizing: CEO-Level Issues

Strategy questions on CEO-level issues usually relate to:

- Competitive issues
- Acquisition opportunities
- Complementary products

How to Approach Strategy Questions

Start with the 3Cs Framework

Kenichi Ohmae's 3Cs framework is an easy and effective way to approach and communicate your answer to a strategy question.

3C stands for customers, company, and competition. Each C covers a critical factor in a successful business:

	Strategic Questions to Consider
Customers	What needs does the customer have? How much are they willing to pay? How many people have this problem, and is it growing over time?
Company	Can the company deliver what the customer needs? This includes the: 1. **Product**. This includes both innovation and product delivery, which includes scale and service. 2. **Marketing and Sales**. This includes the ability to choose, access, and convert the right segment. 3. **Business Model**. This includes not only the ability to *create* value from the product but also the ability to *capture* value too.
Competition	Can the company adequately differentiate itself from others?

Consider Disguising Your Usage of the 3Cs

Many belittle the 3C's framework as commonplace and overused. However, it's enduring because it is:

- Accurate
- Easy to remember
- Applies to almost any business or scenario

I'd recommend that you ignore the critics. Practicality is more important than sexiness. Enhance the 3C's luster by disguising your usage. For instance, instead of the 3Cs, you might want to call it UCR:

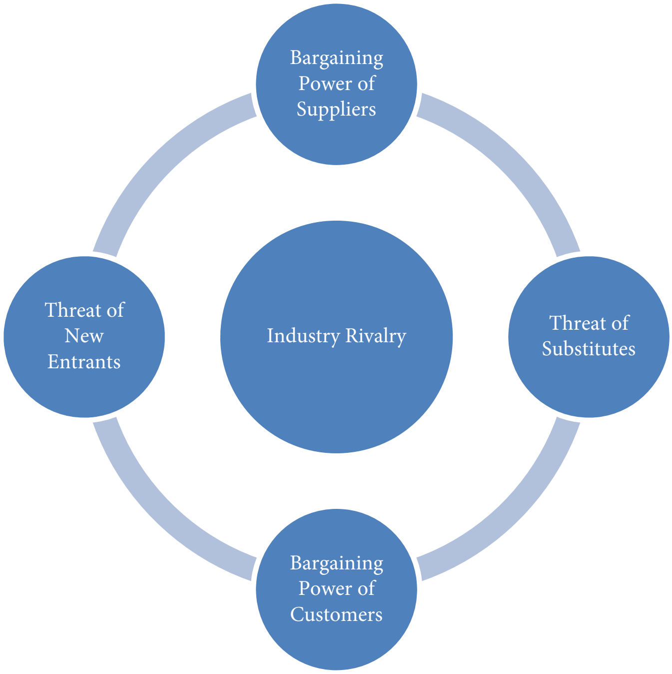
- **U**sers > Customers
- **C**apabilities > Company
- **R**ivals > Competitors

Revisit RICE for Customer Analysis

Don't forget the RICE framework, mentioned earlier. It's an effective way to frame your analysis of customer needs, the importance, and overall business impact:

User Need	Reach	Impact	Confidence	Effort	Score
Write a book	100,000 people	8 out of 10	50%	8 months	50,000 units of impact per month of effort
Discover new books	20,000 people	2 out of 10	20%	2 months	4,000 units of impact per month of effort

Use Porter's Five Forces for Competitive Analysis



Porter's Five Forces is a convenient checklist when thinking about competitive threats. The Five Forces has the following elements:

1. Threat of New Entrants
2. Threat of Substitutes
3. Bargaining Power of Suppliers
4. Bargaining Power of Customers
5. Industry Rivalry

Threat of New Entrants

The following factors indicate whether an industry will attract new competitors:

- Barriers to entry
    - Economies of scale
    - Product differentiation
    - Capital requirements

    - Switching cost to buyers
    - Access to distribution channels
    - Other cost advantages
    - Government policies
- Incumbents' defense of market share
- Industry growth rate

Threat of Substitutes

The following factors indicate whether substitute products, using a different technology, will solve a similar need:

- Relative price of substitute
- Relative quality of substitute
- Switching costs to buyers

Bargaining Power of Customers

This refers to the customers' ability to pressure the target business to provide lower prices, higher quality, or better customer service. Factors that affect the bargaining power of customers include:

- Number of buyers relative to sellers
- Product differentiation
- Switching costs to use other product
- Buyers' profit margins
- Buyers' use of multiple sources
- Buyers' threat of backward integration
- Sellers' threat of forward integration
- Importance of product to the buyer
- Buyers' volume

Bargaining Power of Suppliers

This refers to the suppliers' ability to pressure the target business to pay more, settle for lower quality, or accept reduced inventory. Factors that affect the bargaining power of suppliers include:

- Supplier concentration
- Availability of substitute inputs
- Importance of suppliers' input to buyer
- Suppliers' product differentiation
- Importance of industry to suppliers
- Buyers' switching costs to other input
- Suppliers' threat of forward integration
- Buyers' threat of backward integration

Industry Rivalry

This refers to the extent that competitors within the industry can put pressure on one another and limit profits. Factors that affect industry rivalry include:

- Number of competitors (concentration)
- Relative size of competitors (balance)
- Industry growth rate
- Fixed vs. variable costs
- Product differentiation
- Capacity augmented in large increments
- Buyers' switching costs
- Diversity of competitors
- Exit barriers
- Strategic stakes

Practice Questions

1. You are the CEO of Yellow Cab. How do you respond to Uber?
2. How does LinkedIn make money, and what are the biggest threats?

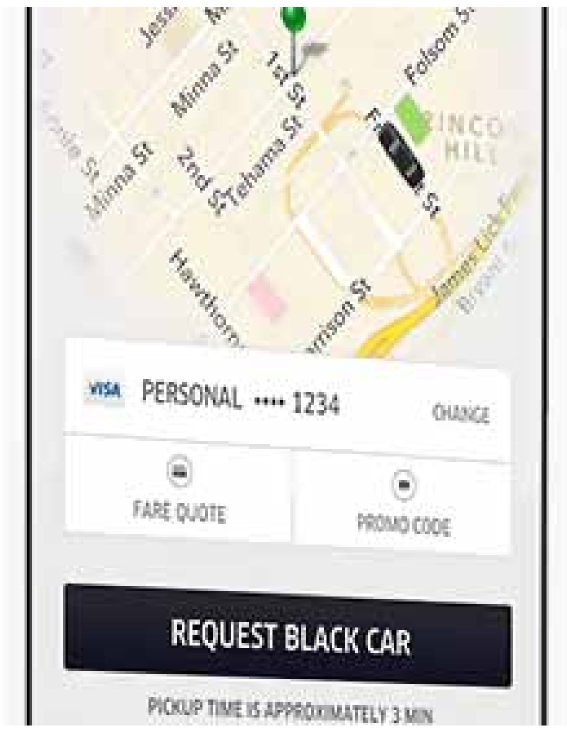
3. Choose a company you believe provides a world-class customer experience. What do they do well?

Answers

You are the CEO of Yellow Cab. How do you respond to Uber?

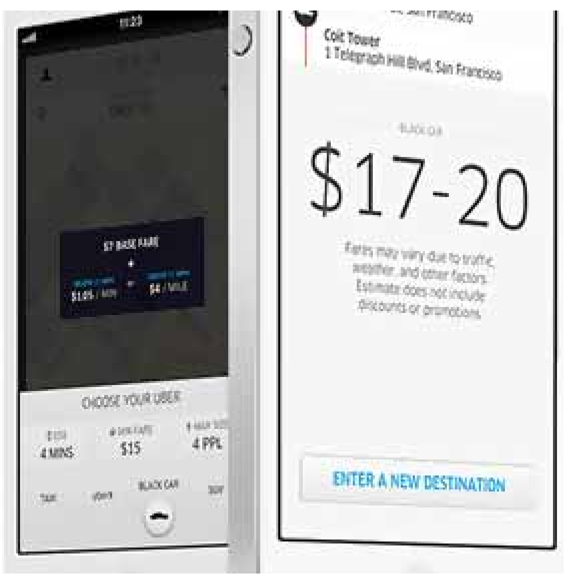
CANDIDATE: I apologize, but I've never used the Uber service. Can you tell me more about it?

INTERVIEWER: Uber allows users to request, ride, and pay for a black car, like a taxi, service using a mobile phone.



The first value proposition is convenience. You can request a car with a single button tap. No more calling the dispatcher and waiting in line.

The second value proposition is reliability. You know that your driver is coming and how far they are from you. No more guessing if the driver is going to show up in 5 minutes, 30 minutes, or not at all.

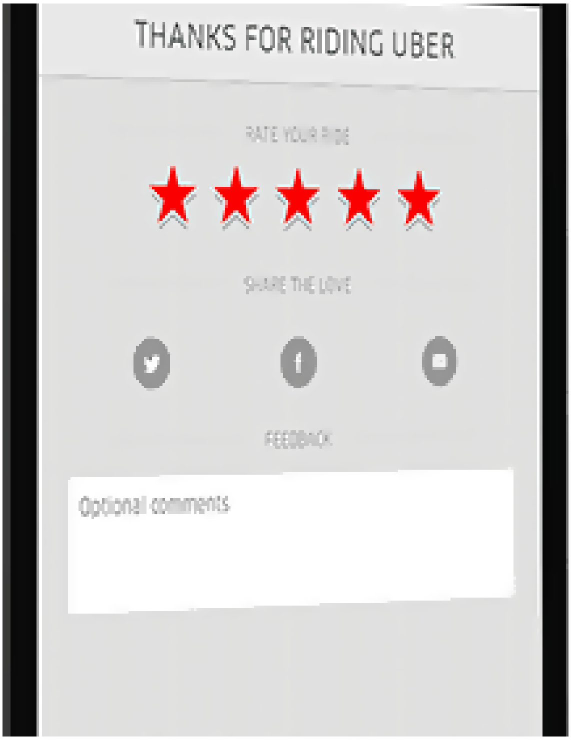


The third value proposition is clear pricing. With a well-defined range, there's no more guessing whether your cab ride is going to cost $15 or $85.

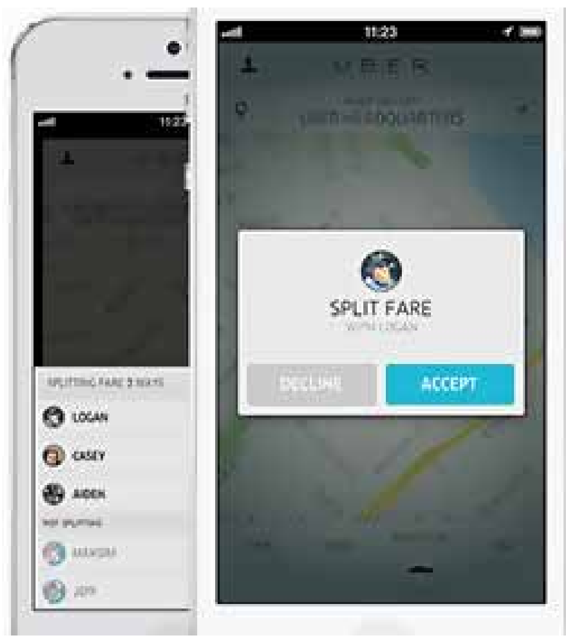
CANDIDATE: Is Uber cheaper than Yellow Cab?

INTERVIEWER: Sometimes it is, and sometimes it isn't. Low price is not a value proposition that Uber advertises.

The fourth value proposition is cashless transactions. No more "Can you drop me off at the ATM?" to get cash or worry about handing credit card details to a driver.



The fifth value proposition is that feedback matters.



The last value proposition is that it's very easy to split the fare with other Uber users.

CANDIDATE: Thanks for walking me through the product. If I were to compare my Yellow Cab experiences with Uber, Uber's most compelling value proposition is reliability. I can't tell you how many times I've called Yellow Cab, and it's either late or never shows up. If I'm trying to catch a flight, not having my ride show up on time or at all, is far from acceptable.

And when I call the dispatcher, they're usually unmotivated, low-paid employees. They either make up an estimated time of arrival or they waste valuable time trying to chase down the driver, get the estimated time of arrival, and communicate it back to me – all while dealing with 1,000 other things at the office.

I feel Uber's reliability and driver monitoring is the main reason the service is successful. Also, there's no need to recite and confirm starting and ending destinations, which can commonly get garbled over a bad phone connection.

As the Yellow Cab CEO, I would work quickly to solve this reliability and monitoring problem.

INTERVIEWER: Are you sure this is how the Yellow Cab CEO would want to respond? Wouldn't they much rather sue Uber because Uber drivers aren't properly licensed?

CANDIDATE: As CEO, I would pursue all tools to preserve corporate profits. However, I would have to have a plan B in case the judicial system deemed them to be legitimate competitors.

INTERVIEWER: Okay, continue.

CANDIDATE: Just to recap, Uber bypassed the taxi dispatcher by utilizing the smartphone and Google Maps. By having customers receive communications directly from drivers, Uber increased the reliability of their car services.

To respond, Yellow Cab should improve its reliability by giving real-time data on where their drivers are and how soon they will get to the user's location.

I have a couple of ideas in mind:

1. **Partner with Uber**. Yellow Cab could allow its customers to hail Yellow Cab taxis on Uber's app. It could provide all the benefits of Uber, including real-time monitoring, cashless transactions, etc. For Uber, partnering would expand its fleet and minimize the regulatory scrutiny around the service. The downside would be that Uber would own the customer relationship. Uber could also build its brand as the destination for hailing a cab. Yellow Cab would risk being a commodity supplier that could be replaced with any other taxi or car service.
2. **Develop a Yellow Cab app**. The app would offer all the benefits of the Uber app. The good news: Yellow Cab's brand has high recognition. Users would quickly install the app. Early tech adopters would be familiar with the core functionality because they've used or heard of Uber. I am guessing the Yellow Cab company has underdeveloped tech capabilities. They could grow an in-house team or outsource the development. Both options are very risky.
3. **Develop an SMS service where customers could get Yellow Cabs**. This option would provide the taxi monitoring benefit of the app while extending the value beyond smartphone owners. Smartphone penetration is about 61 percent. However, SMS penetration is even higher at 87 percent. Of course, it would pose similar technical risks to Yellow Cab as developing an app.

INTERVIEWER: Out of these ideas, which one would you pursue?

CANDIDATE: Given Yellow Cab's strong brand name, I don't think partnering would be necessary for the long term. They could partner with Uber in the short term to get the service going and then build their Uber-like platform in-house. This reminds me of the late 90s when Target utilized Amazon's ecommerce platform temporarily before in-housing that capability. That choice didn't weaken Target's ecommerce prospects in the long term.

And assuming current licensing laws hold, Yellow Cab shouldn't be concerned about being commoditized. Taxi licensing laws prevent an influx of competition (when enforced, of course). Customers will use whatever app provides access to reliable taxis.

Key Takeaways

Show your product sense. The brilliance behind this response is the candidate's keen product sense. He understands:

1. The primary Uber value proposition is about reliability, despite the other benefits.
2. Uber's technology disruption centered on one of the weakest links in the taxicab process, the dispatcher.

How does LinkedIn make money, and what are the biggest threats?

CANDIDATE: I did some research on this last night. Here's the breakdown if I remember correctly:

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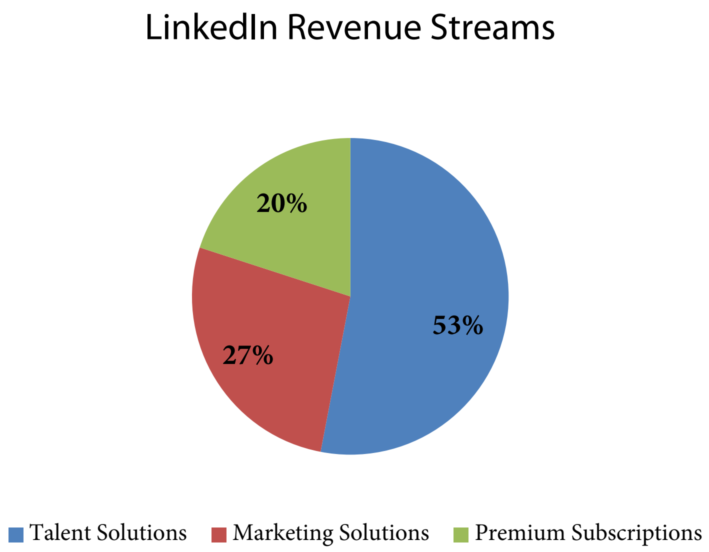


INTERVIEWER: What are the different divisions?

CANDIDATE: Talent Solutions help organizations find and acquire talent. For example, LinkedIn Recruiter allows recruiters to search, view, and contact every profile that's usually restricted in the free offering. And Talent Solutions offer project management functionality to add notes and reminders to key candidates for follow-up.

Marketing Solutions include ads, sponsorships, custom groups, and customization of LinkedIn's InMail. Ads can be targeted based on the user's profile information.

Finally, Premium Subscriptions offer features to help individuals and businesses manage their professional identities, grow their businesses, and connect with talent. These include features to see profile information for third-degree contacts, send InMail to people they're not connected with, and see stats on who is viewing their profile.

INTERVIEWER: Ok, so what are the biggest threats to LinkedIn?

CANDIDATE: I'll classify the competitive threats by divisions:

1. For the Premium Subscriptions team, the threats are niche professional networks. For example, GitHub is a thriving social network for developers. Every audience has specific needs, and GitHub has created functionality to better meet those needs.
2. For Marketing Solutions, the threat is traditional advertisers like Google and Facebook. With behavioral targeting, advertisers can likely reach audiences similar to LinkedIn's.
3. For Hiring Solutions, I imagine Web 1.0 methods of identifying candidates, such as hiring portals from Monster.com and HotJobs, are the prime competitors.

INTERVIEWER: How should LinkedIn respond to niche professional networks like GitHub?

CANDIDATE: Give me a moment to collect my thoughts.

The candidate takes a 30-second pause.

CANDIDATE: I'm not a GitHub user, but if I were to imagine the three main needs of the GitHub audience, here's what I would say:

1. **Collaboration**. GitHub allows teams to easily manage code within organizations. Source control, revision history, and access control lists are some key features that enable collaboration among developers.
2. **Community**. Each developer gets a profile page where they can connect with other developers and projects. It's a great way to identify talented developers and grow your network.
3. **Feedback**. Users can identify which repositories they're working on or following. With open repositories, other users can comment on their work and possibly improve their code.

LinkedIn's best response would be to offer features that address these needs that aren't currently being met by LinkedIn today. For instance:

- **Project repository**. Provide free storage to post work on LinkedIn. Allow users to link to showcase the work from LinkedIn.
- **Community**. Allow users to get feedback on their work. Have permissive creative commons licensing options where users could expand on a user's work and make it better.
- **Collaboration**. Give users an option to collaborate. For example, solicit or hire LinkedIn experts who could help users improve what they're doing.

For each one of these product improvements, the PM team could choose to build, buy, or partner. For example, they could partner with GitHub to easily share their GitHub repositories on LinkedIn.

Note: In 2019, GitHub and LinkedIn are under the same parent company, Microsoft.

Key Takeaways

Homework pays off. Most candidates would have uttered something short and vague like "advertising and premium subscriptions." The details from this candidate convey that he's either an expert or, at the very least, serious about getting an offer.

Competitive-centric analysis. Most analyses we've seen so far have been customer- or market-centric. The candidate chooses to focus from a competitive point of view, and it works quite well.

Don't forget the recommendation. Businesses have goals. As a result, analyses must have recommendations. Make clear what the target company should do next.

Choose a company you believe provides a world-class customer experience. What do they do well?

CANDIDATE: Home Depot has a world-class customer experience. When I think about why, it comes down to three criteria:

- How knowledgeable is the staff?
- Does the staff go the extra mile to help me out?
- Can I find the product I need?

I'll go into more detail. Let's say I have a home improvement problem, but I don't know how to solve it. Without knowing what to solve, I don't know what to buy at Home Depot. Because their staff is very knowledgeable, given that some are even former contractors, they not only point you to the product you need but also give you tips. For customers who are looking for solutions, it's a blessing that the staff cares about solving problems and not just selling products.

The staff typically goes the extra mile to help you out. The other day, I needed to buy a hex wrench to loosen up my sink disposal. The Home Depot clerk and I weren't too sure which one I should buy. Rather than have me buy a couple of wrenches and return the ones that didn't work, he said, "Let's take all these to the sink disposal section and make sure we find a good fit before checking out." I appreciated his extra effort.

Finally, I can always find the home improvement product I need at Home Depot. I rest assured that my time driving to Home Depot is time well spent.

INTERVIEWER: What's an example of a company that has a poor customer experience?

CANDIDATE: Give me a moment to think about it.

The candidate takes 10 seconds.

CANDIDATE: I didn't have to look too far. Lowe's provides a poor customer experience. And here's why:

Understaffed. Home improvement purchases are complicated. Customers need help — whether it's to identify the right product or to pull the right product from the top shelf. Lowe's stores are consistently understaffed, and customers, on average, spend three to five minutes searching for an associate to assist them. Compare this to Home Depot where associates are plentiful and can often be found in less than 30 seconds, providing customers with more pleasing experiences.

Also, Lowe's sales associates are poorly trained. Many of them seem to be new and don't understand Lowe's processes. I've had two occasions where they did a poor job describing how sales discounts were being applied.

Limited product selection. I've had a hard time finding the right products in the store; they don't seem to have Home Depot's extensive product selection.

To improve the situation, I'd address the following:

Improve sales associate knowledge. Lowe's could hire more skilled clerks or provide better training programs. According to a recent MSN Money poll, knowledgeable staff matters most to customers.

Hire more associates. Customers don't like to waste time. Lowe's could help them answer their questions quickly and easily. In addition to hiring more associates, they could provide self-service information kiosks, more product pamphlets, better signage, and a system to locate and page the nearest sales associate.

Increase product selection. Product selection is key. Lowe's could improve it by carrying more goods in-store, supplementing in-store goods with goods that can be purchased online, or partnering with a complementary company.

Key Takeaway

Use your personal experiences. His anecdotes and vivid first-hand experiences elevate his response with authenticity, conviction, and believability.

Chapter 14 Creating Vision

Several top tech companies, including Google and Facebook, care about a candidate's ability to have a compelling product vision. It's important for three reasons:

Thinking big

Many PM candidates default to "me too" innovation. That is, a social network or mobile phone should look exactly like the category leaders.

However, given the barriers to entry, it is unlikely that users will switch to a competitive product that's simply a clone of the market leader. Users will only switch if a product is better. And for that type of improvement, product leaders must think big.

Influence and morale

Product managers lead teams. Product managers are more likely to get things done through a team if they can communicate an innovative product goal.

Credibility

A good vision is big and aggressive. However, at the same time, it's seemingly doable. In May 1961, President John F. Kennedy proclaimed:

First, I believe that this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the moon and returning him safely to the Earth.

It was a grand vision. No man or animal had been to the moon and back. But it was seemingly doable. The previous month, John Glenn had been the first American to venture to and from space. So, this idea of going to the moon seemed both attainable and worth fighting for, despite an aggressive timeline.

How to Approach Vision Questions

1. **Solve a problem**. Cool visions are insufficient; a vision must solve a real problem. This problem also needs to be big, helping billions of people or generating billions of dollars.
2. **Be unique and memorable**. Most candidates answer vision questions with the first idea in their heads. A common suggestion is "tighter integration between two products." Not only is it not compelling, but it also is not unique or memorable. Good visions move us. We obsess over them. We can't wait to share bold visions with our friends and colleagues.
3. **Describe how it will be solved**. There are two parts to a good vision response, and it includes both the vision and how it will be accomplished. Each part should have equal airtime. A response with the first part but not the second will not stick. The vision will be derided as a pipe dream. The burden is on you. Convince people that it's doable and go into specifics.

Practice Questions

1. Choose one of these verticals. Where do you think it'll be in 10 years?
2. What can LinkedIn do on the iPhone that would be groundbreaking?

Answer

Choose one of these verticals. Where do you think it'll be in 10 years?

The interviewer writes on the board:

- *3D Printing*
- *Education*
- *Energy*
- *Mobile*

- *Security*

INTERVIEWER: Choose one of these five verticals. Where do you think it'll be in 10 years?

CANDIDATE: Hmm, I'll choose education. I love my kids, and I think about how hard it is for them to learn. The oldest is trying to memorize a Chinese poem. Yesterday, she cried and cried because she couldn't do it. She wanted to give up.

I gave her a tip: memorize the poem in chunks. It worked. It was easier for her to memorize bite-sized pieces of information, and she memorized the entire poem within one hour.

So, to answer your question, I think in the next 10 years there's a huge opportunity to create the AllRecipes.com of learning; that is, every single lesson plan from every single teacher around the world could be indexed on a single website.

We would develop a PageRank-like formula to determine the most effective way to teach a concept. It would accelerate the learning process exponentially. Who knows? Rather than spend 13 years to get through K-12 education, what if we could teach everyone the same material in just five years?

INTERVIEWER: K-12 in just five years? Impossible.

CANDIDATE: It's a moonshot. I'll tell you why I'm confident it might work. There are 5,000 characters in the Chinese language, but here's the interesting thing: 300 Chinese characters are used in 65 percent of all discussions. Research has found that it's easier to master Chinese if one focuses on knowing just those 300 characters well and inferring the rest through context.

In one week, one can comprehend 85 percent of 300 Chinese characters. Alternatively, it takes three years to learn all 5,000 characters, increasing comprehension by only 5 percent.

The key is to know which 300 characters to learn. That's what this website would help us determine – effective ways to teach.

INTERVIEWER: Okay, good learning methods make a difference; but the challenge is getting all the lesson plans out of teachers' brains and into an indexed system. How are you going to do that?

CANDIDATE: The biggest barrier is documenting lesson plans and teaching methods. Jack Welch can be a great leader, but he can't teach leadership, despite all the books he's written. You see that time and time again: many authors can't teach success. On the opposite end of the spectrum, third-party sources try to document and teach greatness, and they fall short. For example, many authors have tried to capture Warren Buffett's greatness, but fall short.

INTERVIEWER: Okay, so what's your magic solution?

CANDIDATE: There's a new technology that has a lot of promise: the Brain Cap. A University of Washington researcher invented it. It is a computer that can detect brain waves for thoughts and actions. Once the brain waves are recorded, they can be saved or transmitted to another person.

The Brain Cap is still in the early stages of development, but there's potential. If we could constantly monitor and document teachers' thoughts and techniques, we could create the world's most effective database of lesson plans, cut down on learning time, and improve efficacy. This could be the biggest breakthrough for knowledge dissemination and learning since the Internet.

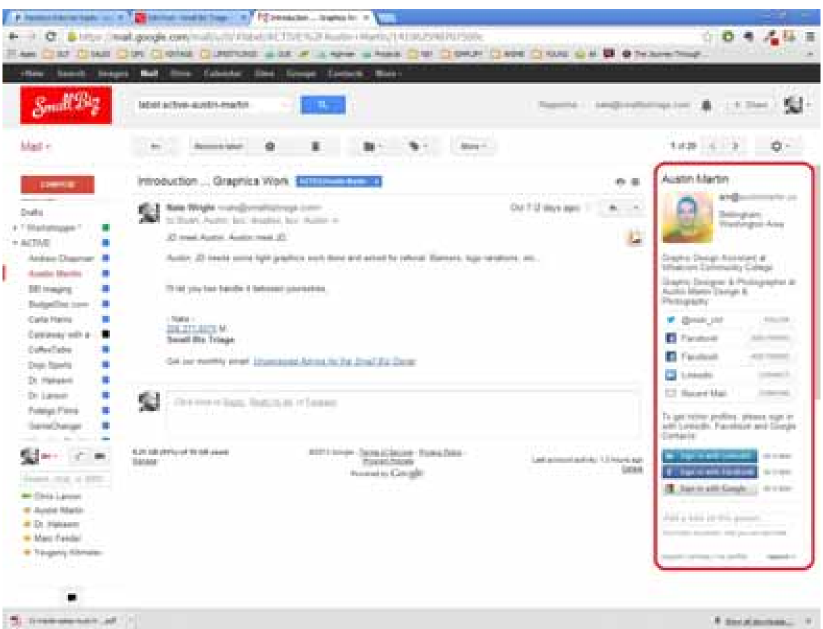
Key Takeaways

Be audacious. The sample answer proposes indexing all lessons on the planet. It is an audacious goal and an important problem.

Address technical feasibility. It's not enough to propose a big problem to work on. Good visions explain, or at least hint, how it would be feasible. The sample answer introduces an early-stage invention that could be a plausible solution.

What can LinkedIn do on the iPhone that would be groundbreaking?

CANDIDATE: When I think about LinkedIn, there's one thing I can do on my computer that I can't do on my iPhone: view LinkedIn profiles in my mail client.



Using a plug-in, my webmail client can pull in LinkedIn information to the right of my email. It provides valuable context on the person I am emailing, what he does, and links to his social profiles.

By comparison, the iPhone mail client doesn't have as much context. Augmenting a mobile email app with LinkedIn information would be immensely helpful.

There are three different ways to accomplish this. First, we could maintain the status quo and have users toggle between their current smartphone mail client and the LinkedIn app or website if they're looking for more information. While the solution is available today, the downside is that it is cumbersome for the user to toggle between multiple apps on their phone.

Second, we could create a new iPhone mail application that augments emails with LinkedIn information. The good news: it would circumvent restrictions one would encounter within an iPhone mail client. Apple is notorious for having a closed ecosystem and blocking other apps from interfering with the core experience. Apple meticulously avoids the fragmentation that plagues operating systems such as Android, where the operating system varies based on the manufacturer and the model. The bad news is that many iPhone users are accustomed to using the iPhone mail app already and are unlikely to switch.

The third option would be to have LinkedIn information in the existing iPhone mail app. It would be the least disruptive of the solutions; it wouldn't require users to learn a new app. However, it could present some technical challenges.

INTERVIEWER: The third option would be impossible. Apple does not have an API for adding information into the built-in iPhone mail app. I understand you want to provide something new and useful, but I don't see how something like this could happen.

CANDIDATE: It does seem unlikely, but I believe we could do it without having API access to Apple's mail client. I've given some thought to how I would implement this.

First, I'd want a dynamic UI. When minimized, I could see at a glance the person's photo, title, and past roles. However, I could tap to expand and see more information including LinkedIn connections, summary, and experience.

Second, I'd want dynamic content. Within the UI, I should have the option to connect with a LinkedIn contact. That's the easy part. Today, we could do that by simply going to Safari. But here's where it gets interesting: the next time I open the same email, I shouldn't have an option to connect to the same person again, since I did it already. Instead, the mail should reflect different relationship statuses including connect, invited, and already connected.

Last, I would need the Apple client to add this information without using an API.

INTERVIEWER: Ok, so where is this going?

CANDIDATE: Let me explain the technical solution that makes this happen. For the third item, I found that while we could not add to the mail client, we could modify the messages themselves. We can store the modified version of the message on a proxy server.

Only the user's iPhone mail client would connect to the proxy server and serve up the LinkedIn-enhanced version of the message. If the user were to view the same message on Gmail on their laptop, they would get the original, unenhanced version from the regular Gmail server.

One of the benefits of the proxy server approach: we know exactly what device is downloading messages, so we can adapt the layout to the right screen size without worrying about compatibility with other devices.

For the first problem, you're probably thinking that we can't render JavaScript inside the iPhone mail client. And you're right. However, the iPhone mail client does render CSS. And CSS does have a :hover state. A mobile Safari browser rendering engine, which the iPhone mail client uses, has a unique interpretation of the :hover state.

There's no hovering on a mobile device. So tapping once is equivalent to hovering over a link. And tapping twice is equivalent to selecting a link. By using this insight, we've enabled an interactive UI in the iPhone mail client. You can tap once to expand a LinkedIn profile. And tap twice to minimize it.

For the second problem, we need the message to check your relationship with the connection every time the email is opened. We can easily have the message check the server by having the status icon represented as an <iframe>. Every time the mail is opened, the <iframe> would load the newest state. And if the device is offline, the <iframe> part of the message would simply default to the last known state.

INTERVIEWER: That's a pretty audacious vision. I can see how you could fulfill it, especially with those Apple hacks. Good job.

Adapted from the article: http://linkd.in/1cKcGzB.

Key Takeaway

Don't be afraid of technical details. In this sample answer, the detailed discussion was necessary to convince a skeptical interviewer.

Chapter 15 Passing the Stress Test

Hiring managers want to gauge how you handle stressful situations. Some test your ability to handle stress through behavioral questions:

- Tell me about a time when you were overwhelmed at work. How did you cope?
- Tell me about a time when you had a difficult deadline. How did you react?

Others will see how you respond to stress by posing a question that makes a candidate feel uncomfortable. This may involve using questions that have no right answer, with the interviewer playing the obnoxious devil's advocate to see whether you waffle or become defensive. Here is an example of how an interviewer might stress a candidate:

Hypothetical Question	"An executive lied to cover up a mistake. Would you report him or her?"
Reaction to An Interview Response	"That's your best management story? It doesn't sound like you have a lot of experience. I was expecting a story where you fired someone."

Interviewers believe that stress simulations are more likely to provide an authentic response.

How to Approach the Stress Test

Understand why the interviewer would ask these questions

The stress test is often about cultural fit. Some corporations look for candidates who aren't afraid of speaking up, even when it means contradicting a respected executive. Other employers want candidates who can adopt mindsets that aren't their own but might originate from someone else in the company.

Prepare for a stress question by understanding your target company's values. It'll give you clues about what interviewers expect in a good response.

Manage stress. The interview is stressful enough as it is. Having a skeptical and obnoxious interviewer makes it more difficult.

To manage the stress, use a technique called exposure therapy. That is, find a friend before the interview. Have that friend be the tough interviewer. As you practice together, you'll be less daunted. You'll realize what everyone else realizes during the stress interview: you'll survive.

Separate the question from the emotion. After the initial emotional flood, approach the question in an objective, intellectually curious way. If you think the question is meant to torture, let those thoughts go.

The interviewer's questions are valid. For example, it's someone's job to determine whether to report a cheating executive. Or, despite the blunt delivery, it's not unreasonable to tell you that they've heard better answers.

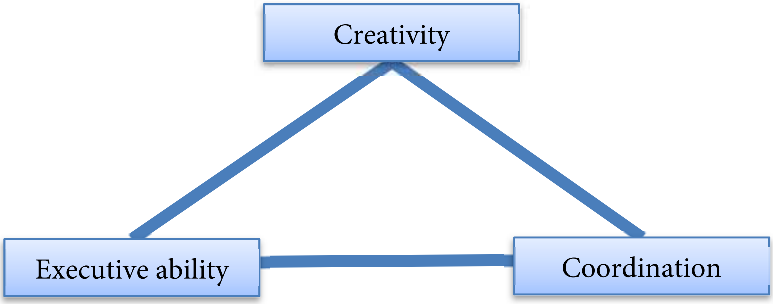
Release your emotions. Focus back on what the interviewer is saying, openly approach the question, think through your response, and construct a thoughtful, objective answer.

Practice Question

1. Look at this diagram. Where would you place yourself, and why?

Answer

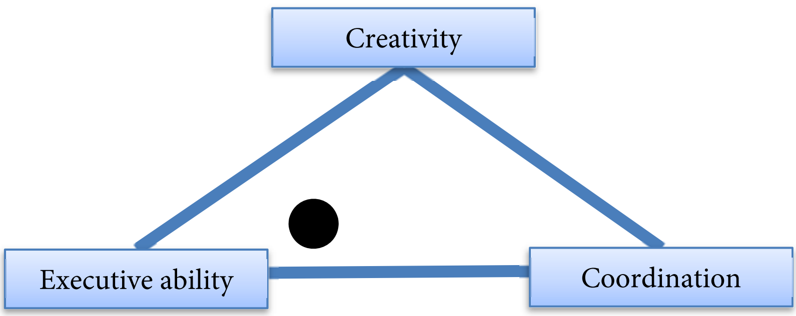
Look at this diagram. Where would you place yourself, and why?



The candidate pauses briefly and flashes a concerned "uh oh" look.

CANDIDATE: I would place myself here.

The candidate adds a dot near the middle of the graph:



CANDIDATE: I put myself there for the following reasons:

Competency	Example
Executive ability	As an Apple product manager, I executed well. I got a lot of stuff done in a short period.
Coordination	When I worked at HP, I was a great coordinator. I had great relationships.

Creativity	I am creative at work and at home. I compete in hackathons and have come up with lots of cool apps.

INTERVIEWER: That doesn't make any sense. Executive ability isn't about execution.

CANDIDATE: Oh.

INTERVIEWER: Also, the dot is far away from coordination and creativity. So, are you saying that you're not creative and have bad coordination?

CANDIDATE: I'm not saying that. No one can be perfect at everything.

INTERVIEWER: You just agreed with my point. And your tone of voice is very defensive.

CANDIDATE: You're right. I got a bit emotional about it. I apologize. Do you mind if I reset and start over?

INTERVIEW: Uh, okay.

CANDIDATE: All right, so I understand that you want to see where I rank across these three dimensions. Do you mind if I ask a few clarifying questions?

INTERVIEWER: Sure.

CANDIDATE: I understand creativity, but I don't understand the other two labels. Can you explain what you mean by coordination and executive ability?

INTERVIEWER: Executive ability refers to your ability to make difficult decisions and sway others to your vision or point of view. Coordination is a measure of your ability to get things done, which includes your perseverance.

CANDIDATE: You want me to assess only these three characteristics, not other strengths and weaknesses?

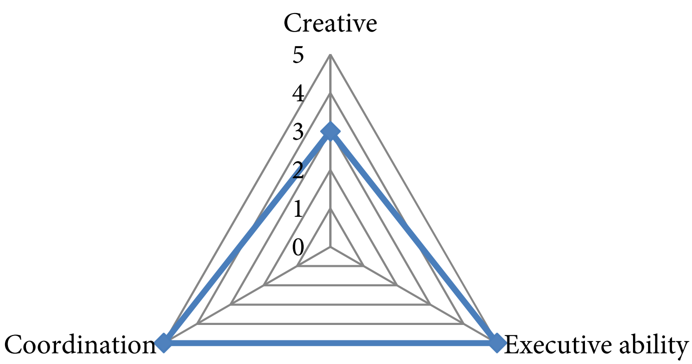
INTERVIEWER: Correct.

CANDIDATE: Here's my first observation about this exercise: I don't think there are necessarily trade-offs between any of these three labels. That is, someone can be strong in creativity, executive ability, and coordination, but this diagram doesn't allow for this possibility.

INTERVIEWER: That's an interesting observation. So how would you manage this?

CANDIDATE: It makes more sense to me to represent myself using a radar chart.

The candidate draws the following on the whiteboard:



CANDIDATE: I rate myself 5 out of 5 on executive ability and coordination, with a three in creativity, and here's why:

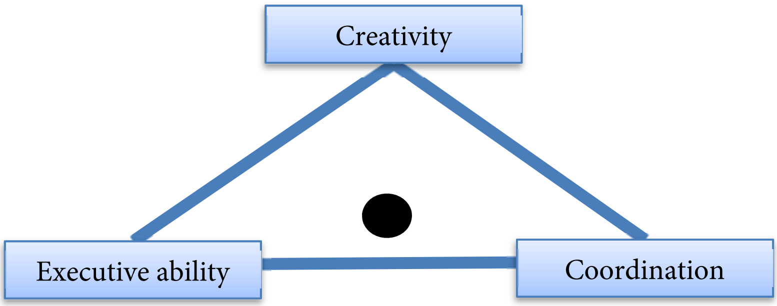
	Example
Executive ability	As an Apple product manager, I had to make tough decisions. For example, back in 2009, I told Steve Jobs

	that we could not ship a fingerprint scanner on the iPhone. He said I wasn't trying hard enough. I gave him the prototypes to try it himself, and he realized how unreliable the technology was. He backed off.
Coordination	When I worked at HP in 2012, I had to lead an effort that spanned three companies, five organizations, and 1,200 people.
Creativity	I am creative at work, especially when coming up with solutions to customer complaints. Back in 2006, when I was a customer service rep, I closed 400 out of 450 customer complaints with a 5-star satisfaction rating. That was the highest score received of anyone at my level.

INTERVIEWER: You make a good point, but I would like you to complete the original exercise using the original diagram, not the radar chart.

CANDIDATE: The best thing to do is normalize the values on my radar chart and map it to your original diagram. Eyeballing the chart, I believe I would be equally strong on executive ability and coordination, but a little bit weaker on creativity.

The candidate draws the following:



INTERVIEWER: Okay, good.

Key Takeaways

Don't be afraid to apologize. It demonstrates courage and your willingness to take responsibility.

Be assertive. The interview isn't a one-sided conversation. You can disagree and propose something better. In this sample answer, the candidate suggested a radar chart. He felt that was a more appropriate way to illustrate his strengths.

Disagree and commit. After you've made your suggestion, the interviewer may accept or reject it. In this case, the interviewer rejected his suggestion to use a radar chart. Don't get offended. Be flexible and show that you're willing to accept her guidance.

Use do-overs judiciously. Your best bet is to avoid do-overs completely. They're awkward. However, if the do-over is needed, as it was in this sample answer, ask for it, try again, and hope for the best.

Chapter 16 Winning the Behavioral Interview

My colleague calls behavioral interviews the free throw of interview questions. It's an apt description. On one hand, behavioral interviews seem easy when compared to difficult case questions. On the other hand, just like basketball, outcomes can be won or lost by a few missed free throws. In other words, don't take behavioral questions too lightly.

Behavioral interviews are questions about your past experiences. They typically begin with either "Tell me about a time …" or "Give me an example…"

Common Behavioral Interview Questions at the PM Interview

Tell me about a time when you...

- developed customer and product requirements
- convinced engineering to build a feature
- made a trade-off between two technical alternatives
- created the product roadmap, vision, and strategy
- led a team
- dealt with a difficult team member
- executed a plan that grew top-line results
- took initiative when not asked to do so
- made an important decision under time pressure
- analyzed a large data set
- gained consensus
- adjusted your project plan to accommodate unforeseen issues
- juggled multiple projects at once
- managed the complete product lifecycle

The behavioral questions can range from leadership to influencing others to end-to-end product management experience.

Why Behavioral Interviews Are Becoming More Popular

Savvy hiring managers are incorporating more behavioral interview questions into PM interviews. These hiring managers have found that behavioral interviews are the best predictors of employee success. For instance, if they asked you, "Tell me about a time when you convinced engineering to build a particular feature," the hiring manager would know from your answer that if you were presented with a similar situation in the future, you would perform similarly, if not better.

What Interviewers Are Looking For

For an ideal response, interviewers are looking for two things: credibility and likability.

For credibility, they're assessing whether you have the competence to do the job. Here are some factors they want to see in your response:

- **Owner vs. participant**. In today's cross-functional organizations, many interview candidates claimed they led a big project or delivered big results. However, if you dig a bit deeper, you'll find the candidate played a marginal role. Or the candidate may have participated in portions of the project, not the entire thing. To uncover the truth, savvy interviewers will ask follow-up questions including who was involved, what you did, and how you did it. It may feel uncomfortable to receive 20 questions on a particular experience, but I have found that it is to your benefit to play along. It will more quickly answer doubts that percolate in the interviewer's mind.
- **Good vs. great achievement**. Interview candidates are clever. They realize that including numbers in their resumes and interview responses may make them more impressive. But even savvier interviewers will want to determine why it was considered a great vs. good achievement. And they want to know whether the

results were largely due to your impact, or if those results would have occurred even without your involvement. Expect the interviewer to ask follow-up questions on baseline metrics such as "How much growth did you see last year?" or "What was the projected increase had you decided not to invest in a new feature?"

We've established your talent by choosing and delivering stories that demonstrate your exceptional experiences, skills, and impact. But likability is the other critical piece of the behavioral interview. It's equally important to develop chemistry or rapport with the interviewer.

Interviewers like to advocate candidates that remind them of themselves. They see themselves as talented and entertaining. For interviewers who potentially interview 2-3 candidates a week, nothing can be more tedious than a candidate who can't find a punch line in their responses or one who talks about their past experiences with the same excitement as watching paint dry.

Not every candidate is a comedian, so I'm not going to encourage you to tell jokes if that doesn't come naturally to you. But you do have to be entertaining and more importantly, earn the listener's full attention.

Your goal is to tell stories in a way that has listeners on the edge of their seats, eager to hear more. To achieve this, shift your mindset. Think of your favorite storyteller, whether it's J.K. Rowling, Stephen King, or Steven Spielberg. How would they tell your story?

There are three key elements in a satisfying story:

- **Colorful characters and settings**. People (and places) have names. Characters have motivations, perspectives, and emotions. You're at the center of the story, so you'll be the hero. And every hero has a villain. To summarize, don't forget the who, what, when, where, why, and how of what you're describing.

- **Conflict**. Every good story resolves a central conflict. For instance, Superman can fly to New York City and save eight million people from a flaming meteor. Or he can save his girlfriend, Lois Lane, in Des Moines, Iowa. Life is about dilemmas, trade-offs, and tough decisions. Good conflicts include unreasonable constraints, impossible deadlines, and Earth-shattering consequences.
- **Resolution.** Every story must be complete, including a satisfying end where the conflict is resolved. Usually, the hero wins. Other times, the hero doesn't win. In those circumstances, there are valuable lessons from a loss that need to be articulated to the listener.

Just because you're discussing a career experience, it doesn't mean you have to recount your career with the same humdrum delivery as a corporate status meeting.

One more tip: every story has a natural progression that covers the beginning, middle, and end. Don't leave the listener wondering: how did it all start? Or make the interviewer think: did you defeat your foe eventually?

How to Approach the Behavioral Interview Question

I do not advocate the STAR (situation, task, action, and result) interviewing method. It's so poorly practiced by interview candidates everywhere that it's become synonymous with a boring, mechanical delivery. (Kaitlin, I inserted a paragraph break here.)

I've developed a framework that more naturally directs the candidate toward the storytelling principles in the previous section. It's called the DIGS method™. The phrase "Can you dig it?" has two meanings. First, do you understand? Second, are you enjoying the moment? We want interview stories that hiring managers understand and enjoy. Hence, the DIGS method™:

D ramatize the situation
I ndicate the alternatives
G o through what you did
S ummarize your impact

I've refined the DIGS method™ with hundreds of clients. I believe that the best way to interview is to pretend that the interview is a casual conversation between friends. The DIGS method™ will get you there.

What Is the DIGS Method™?

Dramatize the situation

Imagine this conversation with a Fortune 500 CEO:

ME: What did you do today?

CEO: I wrote some emails. I went to some meetings. And I yelled at some people.

ME: Oh, guess what, I did the same thing. Emails, meetings, and yelled at people. I guess I can do your job.

CEO: No, no, no. You don't get it. When I was writing some emails, I wrote to John Doe, our chief legal counsel. John is trying to fight a $2 billion antitrust fine from the European Union. When I was meeting with someone, I was meeting with Jane Doe, CEO of Silicon Valley's hottest tech start-up, to discuss whether they should renew their 10-year advertising partnership worth $10 billion. When I yelled at some people…

ME: Ah, I guess I can't do your job.

The key takeaway: context and details matter. If we reduce our jobs to the core elements, it's just emails and meetings. Dramatize the situation and convey why your job, project, or product is important.

Indicate the alternatives

This is an optional step, but if you can do it, you'll be a rock star. When I think about behavioral interviews, they are about problem-solving. You're solving problems with people, products, processes, etc.

Any good problem solver knows that there's more than one way to solve a problem. So why not describe all the alternative solutions?

Without the alternatives, the listener might think to him or herself: "What's so special about that? I would have done it the same way." Candidates can't settle for being normal. This is the interview. Candidates need to stand out from others. They need to be special.

The use of alternatives uses the same theatrical device as dramatizing the situation: it helps us appreciate why what you did was so important.

In general, you'd want to list three different alternatives. One alternative is not enough. Two is better. Three feels complete. But more than three is not necessary; the listener will feel overwhelmed.

And one more thing, talk about the pros and cons of each of the three approaches. You'll be perceived as thoughtful and analytical, which are traits they'll be looking for in top product managers.

Go through what you did

Drop us off in the front lines of action. Give us the details of what you did. Whom did you call? What did you ask them to do? How did they respond? What kind of resistance did you get?

By putting the listener in your shoes, you convince us that you were the front-line owner and driving, not a participant who was lingering in the back row, several steps removed from the core action and the results.

Summarize your impact

Conclude your story by summarizing your impact. Without a summary, you'll leave the listener with the *So what?* feeling. Show the listener that your actions benefited the business' bottom line.

Clean, crisp numbers make a big impact. Did your project reduce costs by 5% or increase revenue by $100 million? Yes, those numbers are hard to recall. I barely remember what happened last week. If you don't remember whether the revenue increase was $1 or $100 million, estimate the impact, if you must.

If there are instances where you've racked your brain and can't come up with a reasonable (estimated) number, a qualitative statement could work too. It could be a quote from a senior executive who thought you executed the smoothest product launch he'd seen in the last five years. It could be a testimonial from a customer who said it was the most innovative feature your company delivered in 20 years.

Either way, a qualitative statement that validates your impact can be just as good.

Practice Question

1. Tell me about a time when you influenced Engineering to build a feature.

Answer

Tell me about a time when you influenced Engineering to build a feature.

CANDIDATE: In my current role, I'm the monetization product manager for our free email product.

Two weeks ago, Emma, the Engineering Manager, gave me some bad news: "William, I'm sorry, but we have to remove the 160x600 skyscraper ad. My Engineering VP told me that the PM team wouldn't mind." I was thinking to myself: "Are you kidding me? Wouldn't mind? This ad was only the third most valuable ad placement on the entire site. It delivered $75 million in revenue per year. Who did Emma think was paying her salary?"

After I collected my emotions, I asked Emma, "When are you planning to remove it?" She said, "Two code sprints from now. About 6 weeks."

I told her, "Can you give me three days to pull some data? I'd like to understand the impact of this decision."

After she left, I thought: what could I do? I could have a hissy fit and complain loudly. Or I could immediately escalate to the Engineering VP. While I was tempted to go with either or both solutions, I knew I wouldn't get what I wanted unless I was armed with the facts. Before I figured my plan, I gave my boss a heads-up. He wasn't pleased with Engineering's unilateral response, but he agreed with my plan.

I logged into the data warehouse and pulled revenue numbers for the last 12 months. Next, I asked the sales team to gauge customer reaction if we no longer made the product available. Last, I reached out to the VP Engineering's Chief of Staff to better understand why we wanted to remove the ad.

After I collected the data, I set up a meeting with Emma, my boss, and the VP of Engineering. The VP of Engineering reiterated his decision to remove the skyscraper ad. He maintained what I had heard earlier: the skyscraper ad was the reason the email product's engagement and market share were down.

I asked him, "Why do you think the ad impacts engagement?"

He said, "It distracts the user."

I replied, "Are there times when you don't find the ad distracting?"

He said, "Yes, when it's relevant to the content. Let's say I'm reading an email about meeting with friends, and the ad suggests things like new restaurants and bars.

I summarized, "So, you don't have a problem with ads. You're concerned about ad quality."

I recommended that rather than remove the ad completely, we should revisit our ad policy and make sure we were serving relevant ads. We could tighten up our ad editorial processes so that low-quality ads weren't mindlessly approved by the system.

He was shocked when I told him that the ad placement generated $200 million in annual revenue. He also didn't realize that by pulling the placement, customers would pull advertising budget, primarily because it wouldn't be worth continuing a relationship with us, given the low ad volume and lack of attractive ad placements, relative to our competitors.

Two months later, we rolled out the new ad policy and approval processes. We minimized many of the low-quality teeth whitening and weight-loss ads that were known for distracting tactics such as pop-ups, fake navigation, and blinking sections. It required a lot more work on our editorial team and advertisers. Shortly after, we found that email user engagement did go up by 3%, and most importantly, we preserved $200 million in revenue.

Key Takeaways

Be a storyteller. Use all the elements of good storytelling: a first-person narrative, details, and a beginning-to-end story arc. Engaging stories draw listeners in.

Have one main point. After hearing this story, what's the lasting impression you want to impart? In this case, it's the candidate's influence skills, which are composed of his maturity, thoughtfulness, and creativity.

Next Steps

Thanks for taking the time to read this book. Now I'd love to hear from you! Please:

- Review the book on Amazon.
- Join my community to find interview practice partners. Search Google for "Lewis C. Lin Interview Practice Community."
- Get 160+ more PM practice questions by grabbing a copy of *The Product Manager Interview* by Lewis C. Lin.
- Move up the PM career ladder by mastering the six proven skills from the ESTEEM Method™, featured in *Be the Greatest Product Manager Ever* by Lewis C. Lin.
- Send any questions, comments, edits, or feedback to lewis@impactinterview.com.

Additional Readings

A Day in the Life of a Product Manager

How to Be a Program Manager by Joel Spolsky

Joel Spolsky's essay gives a day-in-the-life narrative of a Microsoft program manager. Spolsky is the founder and CEO of several prominent products including Trello, Stack Exchange, and FogBugz.

Product Design

The Design of Everyday Things by Don Norman bit.ly/norman-design

This bestseller introduces and explains key design concepts such as affordances, feedback, and consistency through everyday products.

About Face by Alan Cooper bit.ly/about-face-design

This is one of the most comprehensive books I've encountered on the interaction design process and principles.

Process Improvement

The Goal by Eliyahu Goldratt bit.ly/eli-goal

This highly readable book explains the keys to improving any process or operation.

Strategy

What is Strategy? by Michael E. Porter

This treasured classic is a 21-page discussion and definition of strategy by the father of modern-day strategy, Michael Porter.

Creativity

Thinkertoys by Michael Michalko bit.ly/think-toys

Michalko offers an endless number of creative thinking techniques to help you become more innovative.

Google

In The Plex by Steven Levy bit.ly/plex-levy

Written by renowned *Newsweek* writer, Steven Levy, *In the Plex* offers the most detailed glimpse of what Google is like, based on hundreds of first-hand interviews with current and former Google employees.

Facebook

Chaos Monkeys by Antonio Garcia Martinez bit.ly/chaos-antonio

The book, especially Part Three, offers a first-hand account of what it's like to be a Facebook product manager.

Amazon

The Everything Store by Brad Stone bit.ly/everything-brad

Brad Stone provides surprising insight into what's known to be one of the most successful, yet secretive companies in the tech industry.

Hiring

Be the Greatest Product Manager Ever by Lewis C. Lin

I explain the six competencies found in the best PMs, using the mnemonic ESTEEM™:

1. **E**xecution
2. **S**uperior communication skills
3. **T**actical awareness
4. **E**xtraordinary mental toughness
5. **E**xceptional team builder
6. **M**oonshot vision

How to Hire a Product Manager by Ken Norton

Former Google group product manager, Ken Norton shares the six things he looks for in ideal PM candidates:

1. Hiring smart people
2. Strong technical background
3. Product instincts and creativity
4. Earned leadership
5. Ability to integrate multiple points of view
6. Experience shipping products

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