

PREPARING FOR PRODUCT INTERVIEWS

A Product-ive Guide to Landing a Job in PM



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A Product-ive Guide to Landing a PM Job

by

Advaith Sridhar and Akash Ramdas



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PREFACE

Over the last few years, a new trend has emerged – Product Management. We heard about it whenever we read articles about the big tech companies in Silicon Valley, and this role has now spread to almost all tech companies in India as well. The glamour of a role where you dabble in tech, business and design is alluring and for many of us, it seemed like an ideal job.

Then, during our placement semester on campus, we began seeing companies offer this role to us. PM roles are generally offered only to candidates with a reasonable amount of work experience, so the prospect of bagging this job right out of college seemed incredible!

And hence began our earnest preparation for these roles. This is also when we ran into a major problem. We realised that there was no book, no one resource that could help us prepare for a PM interview. The few books on PM interview preparation were all aimed at the American PM role and interview process, and were not that great for preparing for Indian PM roles.

Luckily, we were fortunate enough to have a few brilliant seniors who guided us through placements. They explained the job to us, and held our hand through every stage of the interview process. After landing offers, we realised that not everyone has access to such seniors and the benefits they provide, were incredible and really made a difference, as the competition for these roles was fierce.

This book is a small attempt to level the playing field and ensure that everyone has access to the right material needed to prepare for Product Interviews. It also has a section containing interviews with various Indian PMs, so that people can not only figure out how to prepare for PM, but also better understand why they're preparing for this role, and if it's the right fit for them.

We're always looking for ways to make this book better, and invite you to write to us at contact@thepminterviewbook.co.in with your feedback and suggestions. We hope you enjoy reading this book and we're confident that by the end of it, you will be able to ace your PM interview.

If you would like to know about (and apply to) various PM jobs, would like to have access to more case prep material and interviews, or know about Product Management conferences in your area, fill in this form (<http://tiny.cc/a6zebz>). We'll drop you an occasional email with this content, and we promise not to spam.

ACKNOWLEDGEMENTS

This book would not have been possible without the gracious help and efforts of multiple people. Hence, in no particular order, we express our deepest gratitude:

To Briti, our editor, who read through our book tirelessly and was (and still is) incredibly immaculate in picking out our errors.

To Ayush, our designer, without whom this book would be a lump of text on OneDrive!

To Padmini, Soumya and Arindam, for taking time out of their busy schedules to meet us, and for teaching us what Product Management is about.

To Vineet, Vikram, and Bhaskar for spending time going through the book and helping us improve it substantially.

To Naman, Ajit, Varun and our other placement buddies, for teaching us all we know about solving cases.

To the APMs of Flipkart for helping us create a comprehensive interview guide based primarily on their experiences.

And lastly, to our friends and parents, for their constant support and guidance, without which we would not be where we are today.

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INTRODUCTION TO THE BOOK

Hey!

Welcome to the world of Product Management (PM). Product Management is a unique role, as it sits at the heart of understanding the problem, the user, the technology, and the business. It's a diverse role, and a great opportunity to know how modern companies work. The field of product management is proliferating rapidly today. All companies are looking for someone to take ownership and have an understanding of their product and their customers. Product management isn't just a job; it's a valuable skill which can be used in a variety of roles and positions.

This book is meant for people aspiring to pursue a future in product management. This book is designed to be a useful starting guide for product management interviews in the Indian scenario and will provide you with the skills required to ace PM interviews.

The book is segmented into the following 3 sections:

Section 1: Creating a product pitch deck.

A few PM roles ask you to submit a pitch deck describing products/problems with products you use every day. For tips on how to make a great pitch deck, as well as some sample pitch decks, head over to this section. This section will be useful for those of you applying for case study/entrepreneurship pitch competitions as well.

Section 2: Acing the interview! (Case solving and HR tips)

A PM interview will involve multiple case-solving rounds. In this section, we'll take you through various types of cases asked in PM interviews, as well as leave you with some sample cases as practice material. We'll also share a few tips and tricks to help you clear tricky HR questions. Though these questions usually seem easy to answer ("Tell me about yourself"), a bit of

preparation here can really make the difference between a good candidate and a great candidate.

Section 3: Interviews with PMs

Want to know more about what PMs do? Would you like to read stories and get tips from them? This is an excellent place to understand the role better!

Keep in mind that you need not read these sections in order! If you are someone who wants to know what product management is and whether it is something that intrigues you, then we recommend reading Section 3 first, and then Section 1. If you have an interview coming up soon and want to be prepared, Section 2 is probably the right place to start.

Disclaimer: The authors have generated fictional cases for the purpose of this book. Any resemblance to actual companies is purely coincidental. The authors have made every effort to ensure that the information in this book was correct at press time, the author and publisher do not assume and hereby disclaim any liability to any party for any loss, damage, or disruption caused by errors or omissions, whether such errors or omissions result from negligence, accident, or any other cause.

SECTION 1: CREATING A PRODUCT PITCH DECK

MAKING A SLIDE DECK

In some cases, applying for a PM role may require you to build a slide deck (A slide deck is just a fancy term for a PowerPoint presentation). Even if you haven't been asked to create a slide deck, you may find this section to be of use to you. It will cover how to analyze a product, identify areas to work on, build a solution, and measure its efficacy.

Here's the problem statement we're tackling with our slide deck:

1. Identify a problem that you face with a product that you use.
2. Find a solution(s) for this problem.
3. If you have multiple solutions, compare these solutions and choose the best one.
4. Identify metrics to measure the success of your solution.
5. Identify situations where your solution may not work and reasons for the same. If possible, come up with ways to overcome these limitations.

Before we dive into tackling this problem, here's a quick overview of how this section is structured:

1. Preparing content:
 - a. How does one choose a problem statement?
 - b. Things to keep in mind while identifying a solution.
 - c. Ways to compare multiple solutions.
 - d. Going the extra mile.
2. Presenting content on the slide deck.
3. Analyzing sample slide decks.

How to use this section:

1. Go through the Parts 1 (Preparing content) and 2 (Presenting content on the slide deck) first.

2. Come up with a rough idea of what you want to do and how you want to do it.
3. Draw ideas/inspiration from the slide deck samples. (Note: Do NOT look at the examples before you come up with your own rough structure, as the samples will simply bias/confuse you. Remember, they are merely examples; not the answer to life, the universe, and everything.)

PREPARING CONTENT

PICKING A PROBLEM

- Pick an objective or pick a product. Be familiar with what you choose.
- Pick something you can analyze thoroughly. Something you can play around with.
- Pick something niche/unconventional. This gives you a better opportunity to stand out.
- Novel ideas are not big ideas. You don't need to revolutionize the world with your ideas. Good ideas are generally simple, incremental enhancements.
- Understand the importance of the problem you are solving! Why is the problem relevant? Why does it need to be solved?
- Be specific, but not too specific.

FINDING SOLUTIONS FOR YOUR PROBLEM

- Examine the right product cycle. A product cycle is simply the life story of the product – from its creation to its death. You can also look at user cycles instead, which focus on how the user uses the product, from the start of the user's interaction with it, until the user moves on from that product. You can and should choose to focus on a smaller part of this entire cycle, based on your requirements.

The key to solving any problem is to break it down into smaller components, so make sure you spend enough time getting the cycle right.

- Identify stakeholders and the problems they face at each stage of your cycle.
- Think simple while coming up with solutions. Be as exhaustive as possible.
- Identify a human connection to your solution. This can be done by empathizing with one stakeholder (ideally the customer (pays for the product) or the user (uses the product)) who is helped by the solution.
- Ask yourself the following questions to evaluate your solution:
 - Does it benefit at least one stakeholder? (Ideally, should be a customer/company).
 - Is this the simplest way to solve the problem? (There are no brownie points for using fancy technology and jargon)
 - Can your solution scale and adapt to technology in the future? (not necessary but useful).
- Devil's advocate your solution (or get someone else to). (You can do this with the help of the “Asses Your Slide Deck” sub section at the end of this section.).

COMPARING AND CHOOSING

While trying to compare your solutions, you need to answer the 2 golden questions:

- Does the solution meet the larger goal we set to solve? (For example: Churn Rate, Views, Clicks, Downloads)
- Is the solution easy to implement? (Time, Cost, Complexity, Technology Availability/Restrictions)

These questions can be answered in a variety of ways. You can have:

1. A pseudo-quantitative comparison of selected parameters

You need to compare your solution(s) on their ability to meet the goal and their ease of implementation. You can identify more specific parameters to measure the same. Score each of your solutions based on these parameters. This method is pseudo quantitative, as there is no real mathematical way for you to arrive at a numerical score. Try to be quantitative, using some references or estimations. A perk of this method is that it shows the evaluator that you like to arrive at your choice using hard facts/numbers. It's also more straightforward for someone reading to quickly understand the strengths and weaknesses of each solution. However, there is a downside. Scoring the solutions involves a lot of hand waving and guesswork, and hence, the person analyzing your deck might disagree with the numbers/score you give.

2. A qualitative comparison of selected parameters

In this method, identify specific parameters based on the two questions mentioned above. Then, explain where each solution stands with respect to that parameter. It can also be used to show a depth of understanding. However, it makes it harder to quickly compare and contrast different solutions.

3. A SWOT analysis

Analyze the Strengths, Weaknesses, Opportunities, and Threats of each solution. This is useful to provide a complete solution analysis. It is a valuable method to rigorously compare (out of these 3) completely unrelated and diverse solutions.

You can think of numerous other ways to compare and choose solutions as well. In our opinion, as long as you answer the two golden questions, and

highlight the differences between your solutions, your method is as good as ours.

GOING THE EXTRA MILE

Understand your problem and solution really well. One thing that good PMs do well is to understand their user. They empathize with the person they are solving the problem for. Bring out the amount of improvement you are driving with your solution(s) for that user. A nice way is to understand the user persona is to describe the four stages of a user using a product: Think, Feel, Act and Do.

Another skill that PMs value is a complete understanding of the product. Hence, figure out EVERYTHING about the implementation of your solution. Know how to go about making your solution happen end to end. Work on understanding the influence of your solution on the rest of the existing product.

PRESENTING CONTENT

Here are some pointers you can use to ensure your content is well presented:

1. Make the objective/problem clear, concise, and obvious.
2. Use flowcharts/diagrams to explain the problem and the solution.
3. A picture (read: even badly photoshopped screenshots/photos) is worth a thousand words. Visualize your solutions and provide images!
4. Keep content spread out, and make content flow obvious. Make it easy for people to read.
5. Be memorable, leave catchy slogans that people will notice.
6. Ensure that the slides have a logical content flow. Make sure there are no jumps in your flow from slide to slide. Keep the content transition across slides smooth.

7. Make sure the content on a slide has an overall intent/purpose. Each slide must convey a set of key takeaways for the person reading it.
8. Make it look attractive:
 - a. Use an aesthetic color template (the product you're working on will probably have one too!)
 - b. Use assistive pictures, diagrams, or icons. They help improve the readability of your deck, no one wants to only read pages of text!
9. Give up and get help from someone who understands how to make things look aesthetically pleasing.

AN ANALYSIS OF SLIDE DECKS

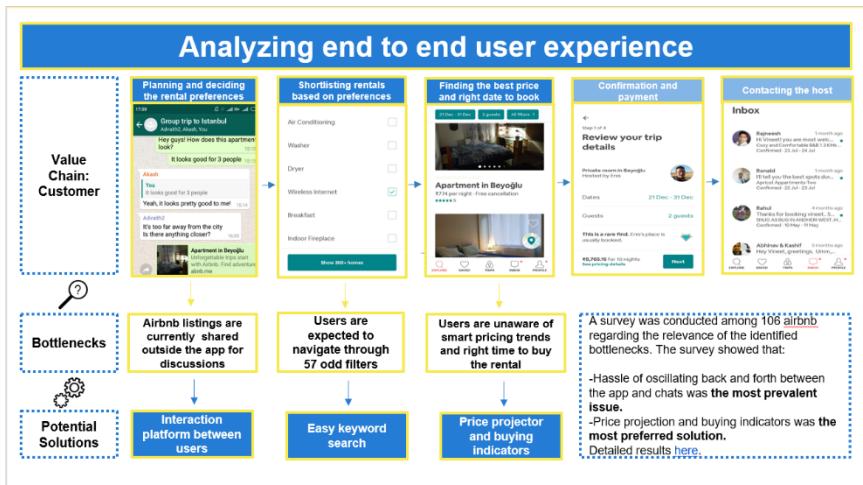
The following is a set of great sample slide decks that you may find useful to refer to. We highly recommend that you do NOT copy them, as doing so will not help you clear the process. Instead, look through them to better understand the factors that set apart a great slide deck from a good one.

DECK 1: AIRBNB

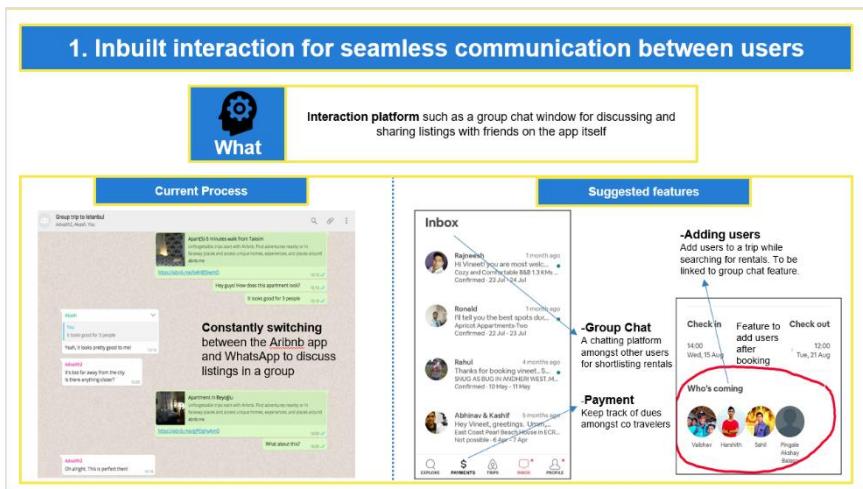
Improving the UX interface for Airbnb

Product		What's inside
Problem		<ul style="list-style-type: none"> 1. Breaking the bigger picture into pieces <ul style="list-style-type: none"> -Identifying bottlenecks -Identifying potential solutions
Summary		<ul style="list-style-type: none"> 2. Analyzing the What, Who, Why and How of the solutions <ul style="list-style-type: none"> -Throwing light on implementation and feasibility 3. Choosing the right solution <ul style="list-style-type: none"> -Identifying criteria -Making the choice 4. The road ahead <ul style="list-style-type: none"> -Identifying the performance metrics-Identifying the risks

- Clear, concise and unequivocal objective .
- A simple roadmap.



- Pleasant color scheme and space usage.
- Helpful flow chart and process analysis to identify the problem that seamlessly leads to a solution. Pictures very clearly show the process.
- The overachieving applicant has done a survey. Way to go! (This is going the extra mile by the way.).



2. Easy keyword search

What

Find the right type of listing based on user's preference **without** navigating through filters and just using keywords in search bar

Current Process	Suggested feature
<p>No results We couldn't find anything matching your search. Try searching other keywords.</p> <p>What can we help you find, Vineet? Homes Experiences</p> <p>Continue your search Istanbul, Turkey > Bengaluru, India Homes and experiences</p> <p>Introducing Airbnb Plus A new selection of homes verified for quality & comfort</p>	<p>Similar search but different results. Hence eliminates the need for certain filters such as home, property type</p> <p>Simple String Matching Airbnb currently matches the filters chosen by the user to the tags attached to a listing</p> <p>Semantic Information Retrieval for Search Queries* A text mining tool to map key terms to the tags attached to a listing</p> <p>ENTIRE BUNGALOW + BEDS Oberhome a home away from home ₹5,400 per night - Free cancellation ★★★★★ 17 - Superhost</p> <p>PRIVATE ROOM + BEDS Maui Bungalow ₹937 per night - Free cancellation</p>

[1] - Di Martino B. (2010) An Approach to Semantic Information Retrieval Based on Natural Language Query Understanding

3. Price projectors and buying indicators

What

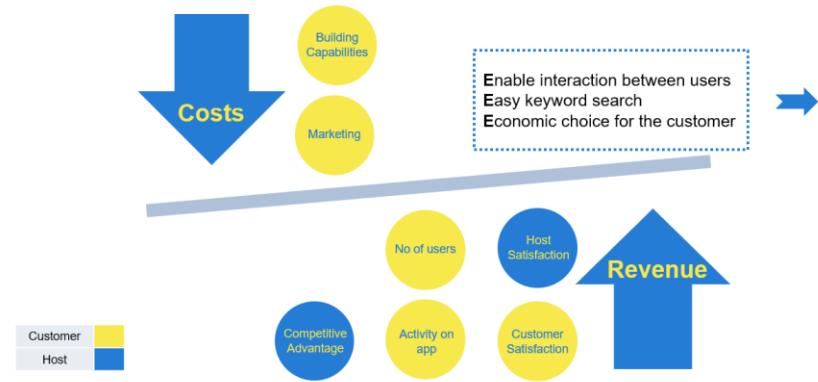
Displaying price projections, buying indicators and watch notifications to help the user choose the best time to buy a listing

Suggested Features	Implementation and Feasibility				
<p>Price projector : Project price fluctuation that prevents early birds from higher price</p> <p>Keeping watch tool : Notifies user about number of users viewing the listing</p> <p>Buying indicator : Indicates best time to buy based on price and demand</p>	<p>The services mentioned as new features gives the user a lot of power to make an economic and sound choice. Hence the services can be classified as:</p> <table border="1"> <thead> <tr> <th>Free</th> <th>Paid</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> All users can avail the keeping watch tool to increase number of users using the app </td> <td> <ul style="list-style-type: none"> Opportunity to include premium users who can avail services such as price projectors and other discounts Measuring click through rate per listing Autoregressive moving average model, bagging regression free ? </td> </tr> </tbody> </table>	Free	Paid	<ul style="list-style-type: none"> All users can avail the keeping watch tool to increase number of users using the app 	<ul style="list-style-type: none"> Opportunity to include premium users who can avail services such as price projectors and other discounts Measuring click through rate per listing Autoregressive moving average model, bagging regression free ?
Free	Paid				
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[2] - Ziridis, Konstantinos & Kalampokas, Theofanis & Papakostas, George & Diamantaras, Kostas (2017) Airfare Prices Prediction Using Machine Learning Techniques.

- Describes the solution in a simple, easy to understand manner.
- Solutions are simple!
- Excellent understanding of the current system.
- The technology needed and impact created are clearly shown.
- Research papers cited. Way to go!

Choosing the best solution : *Analyzing the metrics*



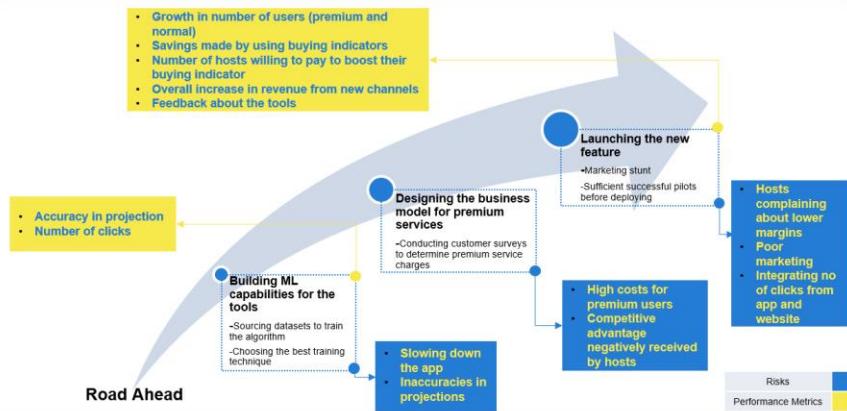
- Identifies stakeholders and metrics that would influence each stakeholder.
- Demonstrates a clear understanding of how each parameter affects the business goal.

Choosing the best solution : *Comparing the metrics*

	Interaction platform between users	Easy keyword search	Price projectors and buying indicators
Customer satisfaction	✓ ✓	✓	✓ ✓ ✓
Activity on app	✓ ✓		
Host satisfaction			✓ ✓
Increase in no. of users			✓
Opens up new revenue sources	✓		✓ ✓
Competitive advantage for hosts			✓
Building capabilities	✗	✗ ✗	✗ ✗
Marketing			✗
Final Score	4	-1	6

- This is a nice pseudo quantitative comparison of the above solutions.
- There are clear cut ideas on how to go forward with the initiative,

The Road Ahead : *Risks and Metrics*



what needs to be done, how to assess performance, and what the risks are.

DECK 2: TOOTHBRUSHES

ARE WE BRUSHING A PLASTIC CRISIS UNDER THE CARPET?

A closer look at the problematic ecological consequences arising from the use of an ordinary *Toothbrush*



- Catchy introduction.

Is your current toothbrush really the **BEST SOLUTION** to achieve those sparkly whites?

Toothbrushes available in the market today come in a variety of shapes and sizes – in fact, electric toothbrushes have even automated the brushing motion (time for the lazy to rejoice!).



However, despite all the innovation that this ubiquitous product boasts of, there are a few aspects that seem to have been overlooked by the toothbrush industry:

- Stiff bristles which may *corrode away the enamel* from your teeth
- *Breeding of harmful oral bacteria* on the base of the toothbrush head in case of improper rinsing as well as the **most fundamental** problem with this product – its **ECOLOGICAL FOOTPRINT!**



The toothbrush we use is primarily made of **PLASTIC**. A couple of brands may blend in some rubber for a better grip and a classier look, but in essence, when one replaces his/her toothbrush every 3-4 months (or longer, if he/she prefers to overlook the American Dental Association's recommendations), *all that plastic more often than not goes straight into a landfill or a water body – and stays there for an eternity.*

**THE AVERAGE LIFESPAN OF AN ORDINARY TOOTHBRUSH IS 3 MONTHS.
WHY ARE THEY BEING BUILT TO LAST FOREVER?**

- Clear problem identification.
- Logical flow to reach the problem.

- Appropriate highlighting (The slide can be understood by just reading the words in bold.).

Let's scrutinize the numbers in better detail...



3.5 billion*
toothbrushes sold worldwide each year
700 million**
sold in India alone



Considering a **market growth of about 0.5 billion per year** (comprising new customers of the toothbrush as a product, as well as existing customers in corporate professions and the like - who are increasingly buying extra 'travel' toothbrushes); as well as factoring in the few toothbrushes which are not dumped and used as jewellery cleaning materials, art supplies, etc.,

that leaves us with

3 billion
toothbrushes dumped worldwide per year***

That is,



3 billion toothbrushes/year × 17g of plastic/toothbrush = 51,000 kg of plastic waste/year

The average toothbrush user lives for 70 years and uses (and disposes) **140 toothbrushes** in a lifetime (assuming a conservative 6 month replacement period). Even if only 60% of the 7.6 billion people across the globe use toothbrushes, that's a whopping **10.8 million kg** of plastic waste generated solely by the innocent toothbrush!

© 2015 00 *according to the 60 Second Marketeer website. **as on indiaindustrystatistics.blogspot.com ***provided all the toothbrushes sold are either in use or being dumped

- Simple color scheme and layout.
- The problem is established using numbers (going the extra mile) – shows and demonstrates an apparent issue.
- The entire calculation is explained along with assumptions.

Can TECHNOLOGY solve this critical problem?

Manufacturing encompasses a variety of technology; the one of interest in this particular case is **Materials Technology** (*definition*: Application of materials science to the development and practical use of conventional or new materials, especially for manufactured products).

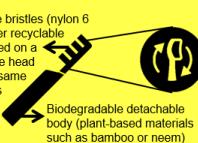
The toothbrush, being a use-and-throw commodity that **must be replaced regularly** to maintain hygiene, generates a **huge amount of unnecessary plastic waste**. An ordinary plastic toothbrush is fashioned from **polyethylene/ polypropylene** (body), **nylon** (bristles), cardboard/plastic (packaging) and perhaps rubber (grip) - **almost a 100% plastic product!**

The best way for technology to pitch in here would be by helping to modify the product and coming up with a greener one. The following describe three possible solutions to combat this excessive plastic usage:

Solution 1



Solution 2



Solution 3


© 2015 00 *source: thesaurusdictionary.org

- Look at the pictures – they make the solution easy to understand.

Well then, what is the BEST SOLUTION?

Let's have a look at the insights brought forth by a **qualitative comparison** of the three proposed solutions:

Comparison Criteria	Solution	Solution 1 Biodegradable materials	Solution 2 Replaceable head	Solution 3 Recyclable attachment
Sourcing of raw material*		<p>Body: Robust material sourced from quick-growing, renewable resources (neem/bamboo wood). Bristles: Animal hair from boars, pigs or horses (can be sourced without animal harm).</p>	<p>Body: Wood from neem/bamboo (interestingly, bamboo chopsticks have a long shelf life despite frequent contact with water). Bristles: Recyclable material like nylon 6 (recycling of used brushes); Head: Same material as the body.</p>	<p>Body and Bristles: Recyclable plastic and rubber material (to be replenished by using new material as well as recycling and reusing material obtained by collecting used toothbrushes).</p>
Manufacturing costs/ Pricing		<p>Sourcing of biodegradable raw material for the bristles is difficult and expensive; prices are hence expected to be 2X or 3X of standard plastic toothbrushes.</p>	<p>Raw material for the heads is cheaper (w.r.t. Solution 1), prices are reasonable for loyal customers (heads are provided at a discount if used ones are returned, and the body is a one-time investment).</p>	<p>Manufacturing costs (and hence, prices) are high, due to the significant costs involved in recycling. Collection of used toothbrushes also adds to the costs.</p>
Adoption issues/ Barriers to market entry		<p>Vegans and vegetarians, and perhaps some non-vegetarians as well, may be uncomfortable with the idea of using animal hair products; animal rights groups may lobby against the product if sourcing is uncertain.</p>	<p>No major adoption issues are likely, as the customers will not be giving up on their usual smooth toothbrush bristles; the higher initial costs (compared to standard plastic models) can be mitigated via government support (tax cuts, etc.) for the eco-friendly product.</p>	<p>Recycling would be dependent on the number of used toothbrushes returned by the customers; also, using of a finger to manually frown the toothbrush may be frowned upon by dentists (hygiene-related issues if the finger is not sanitized)</p>

From the above table, it seems evident that **Solution 2** is the best fit to the requirements specified. The business model should be planned in a manner to **incentivise customers (via discounts, etc.) to return their used toothbrushes and not dispose of them**. Some salient features of the solution are looked at next...

Vmrid 2015.06 *Packaging of all three variants has been considered to be eco-friendly (cardboard and paper). Note: Cells highlighted in red depict problematic facets of the solution.

- This is an example of the qualitative comparison method.

What makes **SOLUTION 2** better than the others?

Considering the **replaceable-head model of solution 2**, here are some of the nitty-gritties one may want to take a closer look at before finalizing it as the best possible solution...

PROS:

- The toothbrush contains a **bare minimum of plastic** (the bristles are made of *recyclable* plastic). Even if the customers choose not to return their used heads and instead buy new ones at undiscounted prices, the solution would still help prevent a large amount of plastic waste from being generated.
- Since only the heads need to be replaced, the **body can be manufactured in lower quantities and priced with reasonable margins** as it is pretty much a long term investment for the customers, especially in the toothbrush industry, where the concept of reusing is alien.
- Recycling can be made easier if sales channels (retail stores) keep boxes to collect used heads (in exchange, **providing new ones at a discounted price**); also, the replaceable heads will not be a bottleneck for production (lesser returned heads leading to raw material shortage) if **sold in multi-packs and returned in a similar fashion**.
- There are **no issues with animal cruelty** and the like; and the product can be used by everyone as it has the look, feel and functionality of the standard toothbrush which the customers are accustomed to using (**unlike Solution 1**).
- Brownie points are won **for sustainability** due to the least amount of plastic (from only the bristles) finally ending up in the landfills or oceans (upon reaching a stage where further recycling is harmful to health) – **as against Solution 3** wherein the entire toothbrush-structure (plastic and rubber) is eventually disposed of.

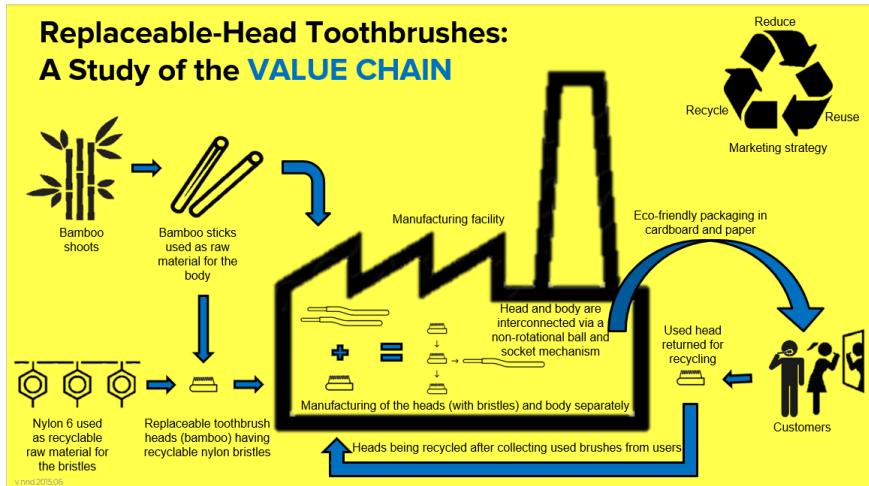


CONS:

- Recycling the bristles may be cumbersome** due to the collection hassle and the costs involved. The usage of recycled material of questionable origins for oral hygiene products may also be problematic in the long run.

Vmrid 2015.06

- Detailed analysis of the chosen solution – touches upon finer details that show the depth of understanding.
- The applicant chose the right value chain to analyze – in this case,



the stakeholder she is solving for is the company making toothbrushes.

- Understanding the of manufacturing of recyclable toothbrushes.

How do we know if Solution 2 is WORKING?

The following points have been arrived at with the assumption that the product has been modified as proposed in the earlier slides, and has then been released in the market, with an advertising campaign in tow.

- The most fundamental way to assess the success of the solution would be by analysing the **sales data** (number of units sold). A complete retention of all the original customers of the toothbrush brand as well as the **capturing of a new customer base of environment-conscious persons** would be the target. The data would also serve as a **feedback** to ascertain how well the 'Go Green' marketing strategy has shaped up, and help in releasing reports on how the plastic woes caused by toothbrush disposal are being addressed by this unique product. This would lead to further positive publicity.
- A second option is to analyse data on **how many of our customers are actually dropping off their used toothbrush heads for recycling**. This data can be obtained from retail stores which stock the product and have kept a box to collect used toothbrush-heads. Data on the tons of plastic recycled, etc., would help to lobby for government support (for tax reduction etc.) as well. If the numbers of used heads being returned are low in a region, a root cause analysis can be undertaken to help address customer convenience issues.
- A third way would be to **survey the general population in the areas of the product's retail sales to obtain customer feedback**, and assess whether the positive feedback outnumbers the negative. This would be a direct indicator of whether the chosen solution will have a good return on the investment in the long run. Platforms such as Facebook can be chosen to conduct these surveys (as well as to advertise the product, perhaps).



- Clear method to measure solution efficacy.

Is the chosen solution GUARANTEED TO WORK?

There may be many unforeseen aspects that can crop up and hamper the success of the chosen solution. A **Design Failure Mode and Effects Analysis (D-FMEA)** early on in the product life cycle can go a long way to mitigate these issues...

Risk	Category	Severity* (10)	Occurrence† (10)	Detection‡ (10)	Risk Priority Number
Compatibility of future designs of the toothbrush heads with older body designs may be an issue – inconvenienced customers may switch to substitutes		8	3	5	120
Adoption of the product may take time - customers may not want to undergo the hassles involved with recycling and may stick to their comfort zone		7	6	4	168
Customers may not trust the quality of the recycled plastic and may steer clear of such a product to avoid compromising on oral hygiene		10	9	4	360
Price of the entire toothbrush may be a deterrent for first-time buyers (since initial investment is higher)		7	7	3	147

As observed from the table above, **quality** is the most sensitive factor of the product. Given that recycling of plastic is expensive, it is a rumoured common practice to mix in low grade plastics so as to reduce overall costs. It is essential to enforce strict guidelines on what raw materials are to be allowed at the plastic recycling facility, as well as **make the customers aware of the stringent quality tests our product goes through**. The ecological benefits, however, largely override these issues. In essence,

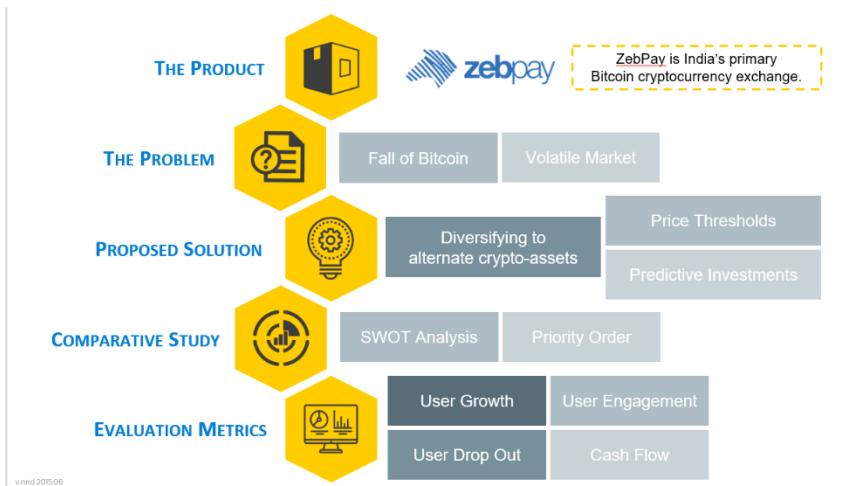
To encourage customers to make the switch[†], it's imperative to have a 'Save the Planet' pitch!

*Low risk (1) - high risk (10) [to the customer]. †Low probability (1) – high probability (10) [of risk]. ‡High probability (1) – low probability (10) [of detecting failure].

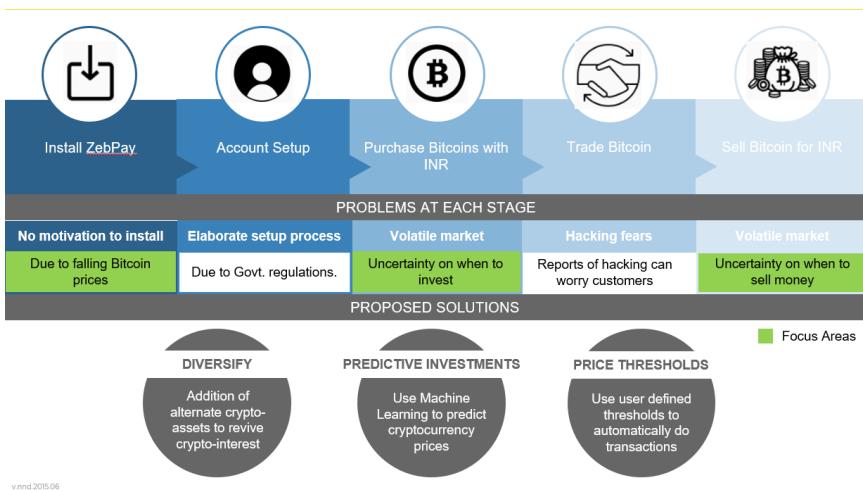
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- A nice method to see potential risks for the product using a pseudo-quantitative risk analysis. Assigning priority and suggesting risk mitigation strategies. (Also, notice the rhyme at the end.)

DECK 3: BITCOIN – ZEBPAY



- Gets right to the point, shows everything that the person needs to know quickly about the deck.



- Clear customer usage flow, with problems identified and solutions briefly described.

SOLUTION 1: DIVERSIFY TO ALTCOINS AND CRYPTOCOLLECTIBLES

Objective



To renew user interest and hence boost key metrics by introducing alternate booming crypto-assets.

Solution



- Swap: Dynamically swap out non-performing AltCoins with growing ones
- Create: One-tap creation of crypto-collectible accounts.

Impact

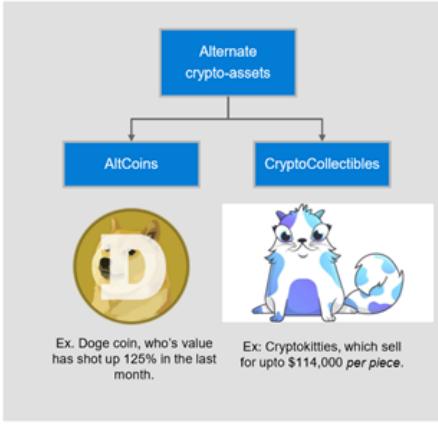


For user: Support for multiple currencies allows our customers to invest in whatever is currently booming.
New alternatives provide enriching user experience.
For company: Increased customer adoption of our product.

Implementation



Engineering: Need to understand cryptoasset's onboarding process. Presence of APIs makes this easier.
Advertising: Need to spread the word about alternate crypto-assets. Will take time



Alternate crypto-assets

```

graph TD
    A[Alternate crypto-assets] --> B[AltCoins]
    A --> C[CryptoCollectibles]
    
```



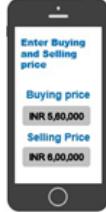
Ex: Doge coin, who's value has shot up 125% in the last month.



Ex: Cryptokitties, which sell for upto \$114,000 per piece.

- The solution is organised in such a nice broken-down manner. It's easy for an interviewer to quickly pick, identify and understand.
- There's a Doge in this slide deck. What more do you need?
- The implementation box shows that the candidate understands the technical nuances of the solutions proposed.

SOLUTION 2: PRICE THRESHOLDS






Objective



To allow users to invest at the right time to make the most profit.

Solution



Users set 2 things manually:

- The price at which they want to buy and sell a particular asset.
- The amount they would like to buy/sell.

Once this is done, the app monitors price fluctuations and completes the transactions automatically.

Impact



- Increased profit as more transactions completed
- Decrease in effort involved per transaction.

Implementation



Easy to implement for engineering and design teams.

- The visuals make the process really simple to understand!

SOLUTION 3: SMART INVESTING

Objective

To allow users to invest at the right time to make the most profit.

Solution

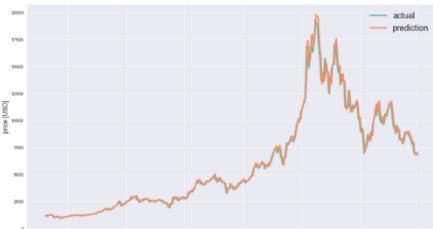
Use machine learning algorithms to predict price fluctuations and growth. Use these predictions to alert users (using push notifications or otherwise) about the right times to buy and sell, for each coin.

Impact

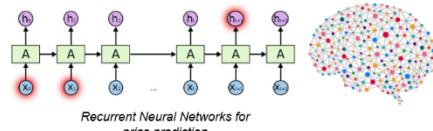
For user
1. Increased profit as more transactions completed
2. Almost no effort for the user.
For company
1. Increased app adoption.
2. Customer loyalty.
3. Increase in revenue per user (users are charged a transaction fee for each transaction)

Implementation

Hard. Due to the volatile nature of crypto-assets, predicting their fluctuations is an ongoing research area. Could be looked at as a long term R&D project.



A line chart comparing 'actual' (green line) and 'prediction' (orange line) price over time from 2017-04 to 2018-04. The y-axis is labeled 'Log10(price)' and ranges from 0 to 2000. The x-axis shows months. Both lines show a general upward trend with significant volatility, particularly a sharp peak around December 2017 followed by a decline.



Recurrent Neural Networks for price prediction

The diagram illustrates a sequence of recurrent neural network units. Each unit is represented by a green rectangle labeled 'A'. Inputs (purple circles with 'X') feed into the first unit, which then produces an output (purple circle with 'Y'). This output becomes the input for the second unit, and so on. A brain icon on the right represents the neural network architecture.

SOLUTION COMPARISON : SWOT ANALYSIS

	DIVERSIFY	PRICE THRESHOLDS	SMART INVESTING
STRENGTHS	Revive interest in old users Bring new users to the app More transactions and hence, more revenue	More transactions, more revenue Easy to use Easy to implement	More transactions, more revenue Easy to use
WEAKNESSES	List of Crypto-assets needs to be constantly updated	Not effective with Bitcoin due to its current fall	Large R&D Investment Risky with high chances of failure
OPPORTUNITIES	Can make the app go viral Unique USP for our product	Can be rolled out for alternate crypto-assets as well	Can generate huge profits
THREATS	Lack of awareness about different crypto-assets	Can be easily copied by competitors	Multiple research groups working on the same problem

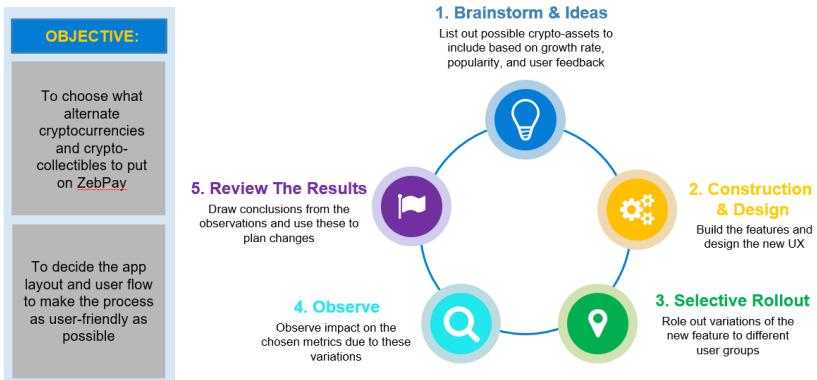
←

HIGH
SOLUTION PRIORITY
LOW

→

- This is an example of a SWOT analysis. This is particularly nice because all solutions have been identified side by side.

ROLLING OUT ALTERNATIVE CRYPTO-ASSETS: A/B TESTING



v.indd 2015.06

- There's a clear plan describing how the solution will be rolled out. In addition, it is explained using simple stages, along with the results expected from each stage.

METRICS FOR MEASUREMENT

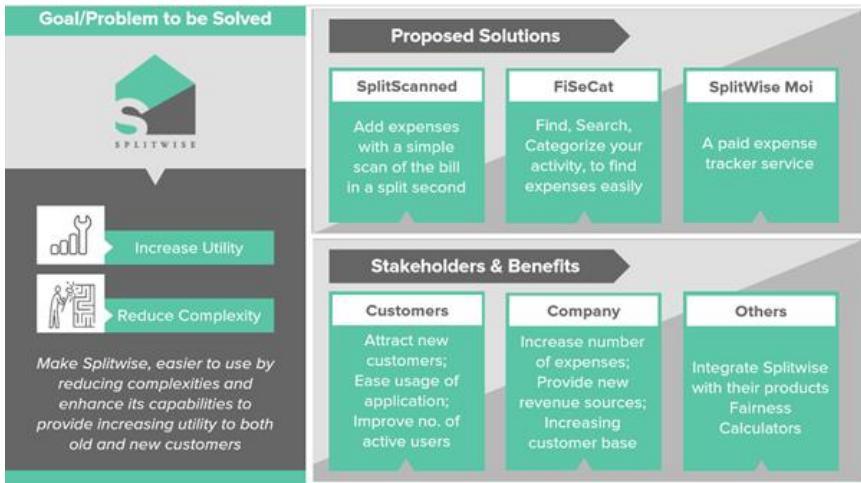
Evaluating the Diversification Solution

	User Growth	User Engagement	User Drop Out	Cash Flow
Top Priority	App Installations per Week	Avg. number of transactions per user per week	Weekly Churn Rate	Total Weekly Revenue
Medium Priority	Number of users	Weekly Active Users for each crypto-asset	Average user lifetime	Weekly revenue from each alternate crypto-asset
	% of users signing up for alternate crypto-assets	Number of transactions per crypto-asset per week	Number of inactive users per week	Average amount invested per transaction
	User Reviews and Feedback			Transaction fee for each crypto-asset
Low Priority	App size, Installation time	Number of alternate crypto-assets		Cost of maintaining each alternate crypto-asset

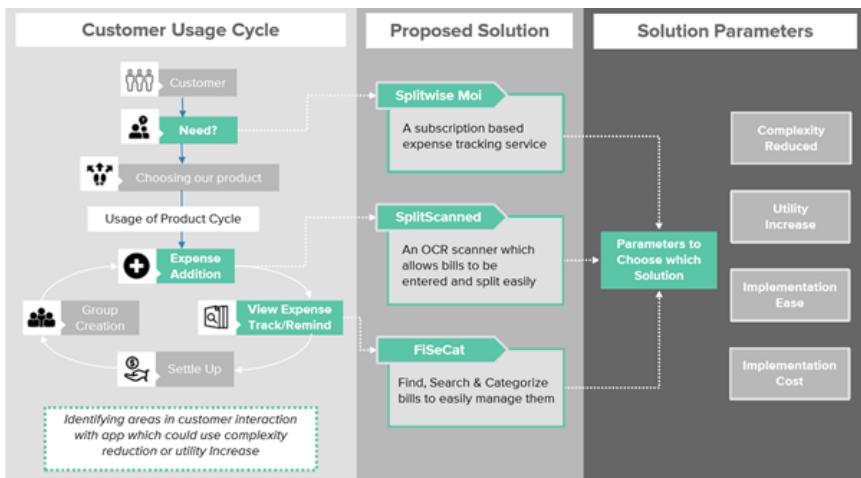
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- The candidate goes one step further, by not just defining metrics but also ranking them in order of importance. Each metric is also linked to the evaluation criteria that it affects. Way to go!

DECK 4: SPLITWISE



- Clear objective: A brief description of the solutions and benefits for the various stakeholders of the app.



- A clear Usage Cycle for each customer used to showcase the problem to be solved .

SPLITSCANNED

The diagram illustrates the transition from an 'Old System' to a 'New System' for managing bills, specifically focusing on grocery expenses.

Old System: Shows a screen where a bill for \$120.00 is split "UNEQUALLY". It lists "Groceries" and "With you and S Our apartment".

New System: Shows a screen titled "Add a bill" with a camera icon and the instruction "Take a photo of the document". It displays a receipt for "FARMS" with items: Coffee (\$3.50), Steak and eggs (\$13.00), Fried chicken Benedict (\$12.00), and Mimosa.

A central callout box states "Using Optical Character Recognition (OCR)" with an arrow pointing from the Old System to the New System.

Category	Old System	New System
Problems Tackled	<ul style="list-style-type: none"> Multiple Entries Required No break up of amount present Item wise Splitting not possible 	<ul style="list-style-type: none"> All information – date, itemized split from one click Easier unequal splitting of bills
Utility Increases	<ul style="list-style-type: none"> Scan bills from gallery, record mailed invoices easily Potential to Integrate with app invoices – like Ola, Uber,etc. 	<ul style="list-style-type: none"> Open source OCR scanners present in online repositories OCR scanning of bills exists in some apps already
Implementation Ease		
Issues		<ul style="list-style-type: none"> OCR Accuracy – Detection Errors – Maintenance App Size will increase, due to new features More data needs to be stored on Splitwise cloud
Predicted Costs		<ul style="list-style-type: none"> Costs Estimated for feature deployment - \$ 24950 Projected transaction increase: 6% / month Per transaction benefit: 2% of \$5 (Average transaction) Estimated revenue increase: \$ 9000 / month

- Clear comparison between the systems and influence it has on the parameters chosen.
- It also highlights potential issues with the solution.
- A cost-revenue estimate has been included. (Note: only do this if you are reasonably sure that you can back the numbers you put down.).

PREPARING FOR PRODUCT INTERVIEWS

FISECAT

Old System

New System

Problems Tackled <ul style="list-style-type: none"> No way of finding a particular expense Categories only aesthetic 	Complexity Reductions <ul style="list-style-type: none"> Search bar allowing easy finding of expenses Quicker understanding of bills 	Issues <ul style="list-style-type: none"> Advertisements may irritate the app users App Size will increase, due to new features More data needs to be stored on Splitwise cloud
Utility Increases <ul style="list-style-type: none"> Selectively export the relevant Exchanges by person/category Access to exclusive discounts from advertisers 	Implementation Ease <ul style="list-style-type: none"> Search bars, & algorithms readily available Category system & filters replicable 	Predicted Costs <ul style="list-style-type: none"> Costs Estimated for feature deployment - \$ 20400 Projected transaction increase: 4% / month New revenue source : Ads: \$1000/month/brand Estimated revenue increase w/o Ads: \$ 9000 / month

SPLITWISE MOI

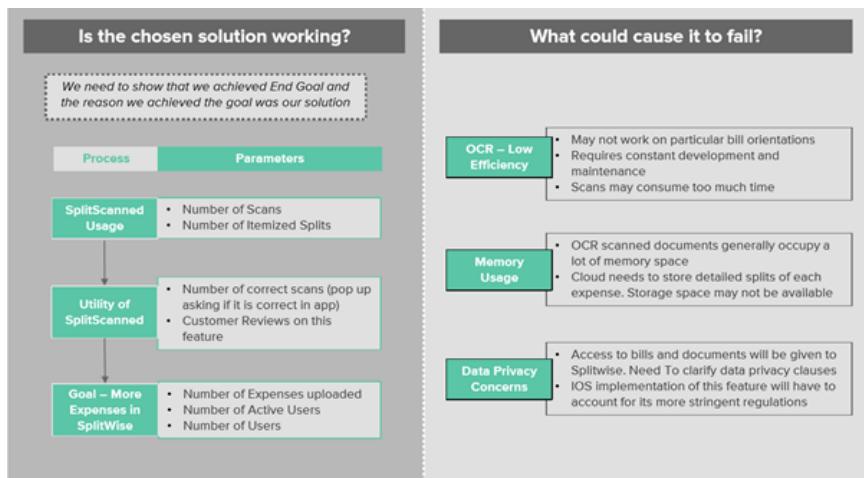
System

- Spend History
- Integrate with SplitScanned & FeSiCat
- Budget Tracking
- Spend Visualization
- One stop Spot for all Expenses
- Club Expense into Buckets

Problems Tackled <ul style="list-style-type: none"> No need to use splitwise regularly Customer base size 	Complexity Reductions <ul style="list-style-type: none"> Search bar allowing easy finding of expenses Quicker understanding of bills 	Issues <ul style="list-style-type: none"> Complete interface overhaul needed Integration with SplitScanned & FeSiCat only allows tool to be sufficiently useful
Utility Increases <ul style="list-style-type: none"> Can keep track of all expenses in one place Splitwise calculators facilities easy visual budget tracking 	Implementation Ease <ul style="list-style-type: none"> Difficult to Implement Need for subscribed version Existing expense tracker apps uses need to be integrated 	Predicted Costs <ul style="list-style-type: none"> Costs Estimated for feature deployment - \$ 112,960 User increase (based on expense apps): 2,000,000 New revenue source : \$1/month/user Estimated revenue : \$ 200,000 / month

Idea Comparison			
Comparable Criteria	SplitScanned	FiSeCat	Splitwise Moi
Implementation Ease	✗ ✗ ✗	✗ ✗	✗ ✗ ✗ ✗ ✗
Implementation Cost	✗ ✗	✗	✗ ✗ ✗ ✗ ✗
Utility Increase	✓ ✓ ✓	✓	✓ ✓ ✓ ✓
Complexity Reduction	✓ ✓ ✓	✓ ✓	✓ ✓
Implementation Timeline		16 Weeks	
		9 Months	

- This is another example of the pseudo quantitative analysis of parameters. Also, notice the timeline made for implementation. Way to go!
- Note:* It's alright if the timeline (or something else based on guesswork) isn't exactly right. The reviewer wants to see that you've put in sufficient thought into the details of implementing your solutions, and charts like these can help you show that you have. At



the same time, don't forget to do a quick sanity check, you don't want to have absurd numbers on your slide deck!

- This slide answers two important questions:
 - Am I getting desired results?
 - Are these results coming because of my solutions, or are there other factors at play?
- The failure analysis shows that the candidate has a holistic understanding of the solutions.

Cost Estimates for FiSeCat		Cost Estimates for SplitScanned	
Head	Cost	Head	Cost
New Hires - 1 – India	\$ 4,400	Users spending in Category (2.5%)	75000
Design Cost	\$ 6,000	Per customer reach pay (assumed)	\$ 0.01
Deployment and testing	\$ 10,000	Total Value	\$ 1,071.43
Total	\$ 20,400		
Current User Activity	3,000,000	All Costs obtained from estimating values from: http://www.businessofapps.com/guide/app-development-cost/	
Current Increment	90,000		
New user Activity	30,000		
Average transaction per expense	\$ 5.00		
Transcation %	1%	Transaction increase is assumed as:	
Per Expense gain (\$)	\$ 0.05	3%(Current) + 1%(New)	
Gain (per month)	6,000		
Other Sources		<ul style="list-style-type: none"> The app statistics were obtained from Similar Web, AppAnnie, & Google Play Store App Screenshots taken from Splitwise presskit & personal phone Screenshots edits were made using Paint & Invision Software Tools. Icons take from Noun Project. Design courtesy of: Kirby Hu, Chris, Icongeek, Marie van den Broeck, Aneeqa Ahmed, Adrein Coquet, Icons, Gregor Cresnar, Arthur Shalin, Josy Dam Alexis, b farias, Rose Alice Design. 	

- Contains the math behind the numbers proposed, while clearly stating assumptions and references for the information used. Well done!

ASSESS YOUR SLIDE DECK

You have put in the thought, seen the slide deck samples and designed your own aesthetic slide deck. Now, these are a list of factors you should look at to self-evaluate your deck! The way to use this is to see if your slide deck easily answers the questions listed below.

Note: These may not be the actual parameters used by the interviewing company to assess your slide deck. However, it is a useful tool to self-evaluate your work.

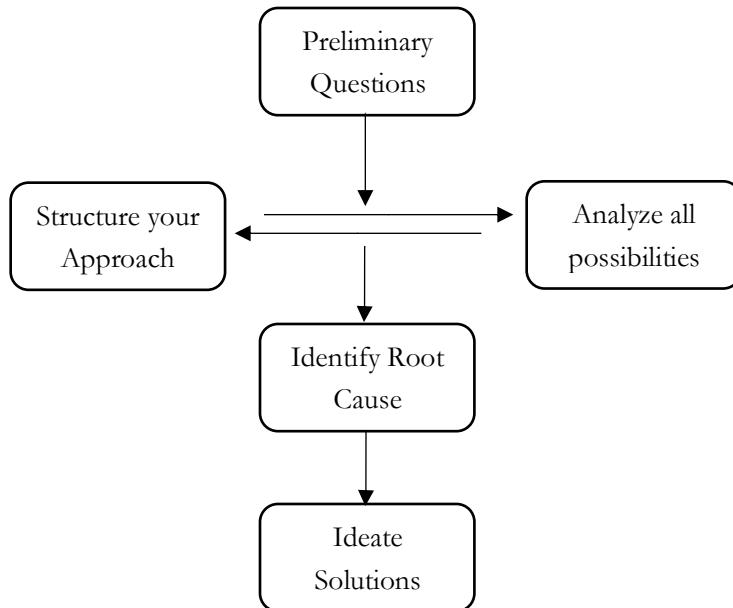
Ability to identify and structure the problem	Is the problem relevant to the customer/user/company? Has this relevance been clearly shown in the slides? Is the problem presented in a clear manner? (Usually by establishing a goal/objective) Is the problem broken down to smaller solvable sub-parts?
Creativity in Solution	Is the solution simple and straightforward? Is the solution something novel for this product? Does the solution solve the problem and meet the objective?
Ability to Critically compare and analyse solutions	Is there a comparison of different solutions? Is the comparison close to an “Apples to Apples” comparison? Is there a detailed understanding of the implications of the solution on the rest of the product? Are use cases which might lead to failure of the solution identified and tackled?
Design and Presentation	Is the font readable? Is the color scheme pleasant to the eyes? Are there clear flow charts and cycles to explain the various aspects of the deck?

SECTION 2: ACING THE INTERVIEW!

PROBLEM-SOLVING CASES

INTRODUCTION

One of the most critical skills you need as a product manager (PM) is the ability to find and solve hidden problems. As a result, problem-solving cases are generally the first type of interviews you'll encounter when interviewing for a PM role. These cases test your ability to think analytically, and more importantly, your ability to come up with a strategy to tackle unstructured problems. There's no clearly defined approach to solve these cases and no magic formulae that you can apply. Each case is different - you may encounter new terms and learn new things while solving the case. However, there's no need to panic. Given below is a broad strategy you can follow to tackle any problem-solving case you get:



Flowchart 1: The Problem-Solving Approach

The stages of this approach are:

1. **Preliminary Questions:** The case statement your interviewer gives you will often be short and vague. You'll need a bit of context about the company, the product, and the case statement before you can even begin to solve the case. Let's take an example to illustrate this better.

Case Statement: *A social media company, XTZY has shown a drop in monthly active users on its platform. What should it do?*

Preliminary Questions could be:

- How are monthly active users defined? (Clarifying statement)
- For how long have they been seeing this trend? (Clarifying Statement)
- What does XTZY's platform do? (Clarifying Product)
- Does XTZY face any competition? What is its market share? (Clarifying Market)
- Where does XTZY operate? (Clarifying Company)

Never underestimate the importance of asking questions before you start solving. A solid initial understanding of the case can make the whole interview a lot easier. Do NOT jump the gun and begin solving the case immediately. Remember, slow and steady wins the race.

2. **Structure your Approach:** There are a lot of different things that can be examined while solving a case. To ensure you don't get carried away, and to help you consider all possibilities, it's essential to structure your approach at each stage. What this usually means is being *MECE*.

MECE: MECE stands for *Mutually Exclusive, Collectively Exhaustive*. This means that you define your categories such that all the items you need to look at are part of exactly one category. For example, one way

of analyzing users is by age. Let's take 3 categories - youth (defined as below 18 years of age), working-class (between 18-65 years of age) and retired (above 65 years of age). This split is MECE, because all users will fall into these categories, and each user will belong to exactly one category. Being MECE ensures that we don't forget any category, and at the same time, don't double count things either.

3. **Analyze all possibilities:** Once you've chosen a target area to focus on, analyze and understand this segment completely. Pay attention to hints from your interviewer, as she/he will help you know if you can drop a particular line of thought, or if you should explore it further. Structuring and analyzing is a cyclic process. You need to do it repeatedly until you hit the root cause of the problem.
4. **Identify root cause:** After going through steps 2 and 3 repeatedly, you'll hit the root cause(s) of your problem. They're usually easy to identify, and if you're unsure of whether you've reached it, it never hurts to ask your interviewer another question, just to be sure!
5. **Ideate solutions:** Now that you've identified the root problem, think of solutions! Be as creative and unorthodox as you can while thinking of them. Also, ALWAYS remember to check the feasibility of each of your solutions.

That's all you need to know to get started with the cases in the next few pages. Before you do so, however, you may find the below tips useful:

- Do not read through all of the cases. Instead, solve them with your friends. These cases are generally solved in groups of 2, with one person being the interviewer, and the other, the candidate.
- As you solve the cases, you'll often stumble across new words and definitions. Don't worry if you haven't heard of them before, it's the role of the interviewer to explain something new as it comes up.

- It's fine if the candidate doesn't solve the case in the same way as it's been written in the book. As long as the candidate can hit the various checkpoints in the case (denoted by stages), she/he's doing well.
- The answers aren't as important as the process. Don't be biased for or against a particular problem or solution. Your interviewer is checking your ability to be methodical in your approach is, and the thoroughness of your analysis. Discovering the root problem by asking a lucky question won't win you any brownie points here.
- Each company/product has its own unique strengths. Look for synergies between your solution and what the company/product already has, and be aware of the company/product's existing strengths and weaknesses.

EVALUATING YOUR PERFORMANCE

It's not just enough to solve a case, but it's important to reflect on the case and evaluate yourself as well. Here are some parameters you can use to assess yourself:

You can use these parameters to assess all the cases you solve in this book, not just the problem-solving ones. With this knowledge in mind, let's solve our first case!

Structuring	Did the candidate break the problem down into smaller components and identify a root cause? Was the candidate MECE in her/his structuring?
Adaptiveness	Did the candidate take hints from the interviewer when given? Did the candidate take cues from the data presented to her/him? Did the candidate fixate on a particular assumption for too long?

Creativity	Was the candidate able to come up with a solution to the problem? Did the candidate consider all implications of her/his solution?
Synthesizing	Did the candidate briefly explain the case, its problem and the solution? Did the candidate explain the root cause? Did the candidate synthesize in a short period of time?

CASE 1: LEAVING HOME

Leaving home is hard. What's worse, however, is people leaving your home page.

CASE STATEMENT

You are a PM at the e-commerce store Flipkart. Customer interaction with the Flipkart app homepage has been declining over the past year. Find out why, and discuss ways to reverse the trend, if need be.

PRELIMINARY QUESTIONS

What is the home page?

The home page is the first page you see when you open the Flipkart app. It has 6 sections:



Image 1: Screenshot of Flipkart Homepage

1. The Hamburger menu on the top left.
2. The Flipkart Plus icon, right next to the hamburger menu.
3. The search bar, in the upper middle part of the page.
4. The notification and cart icons on the top right.
5. Banner advertisements in the upper middle section of the page.
6. Category selections on the lower half of the page.

(Interviewer note: You can show the candidate the image.)

What does interaction mean?

The interaction of a user with the home page is measured by a metric called the bounce rate. **Bounce rate:** The number of people who do not click on anything, for every 100 people who land on the page. Users click on something when they find the content relevant to them. The bounce rate has varied in the following way:

Year	Bounce Rate
2017- 2018	15.0 %
2018- 2019	16.5 %

Is the trend similar across Android and iOS devices? Has the website seen a similar decline as well?

For this case, let us assume that Flipkart only has an Android app. The decline has been across all Android devices. We are also only concerned with the app, and will not be looking at Flipkart's website.

What does Flipkart do?

Flipkart is an e-commerce platform present all over India. It has close to 200 million users and is India's biggest e-commerce platform.

Has the number of users visited the Flipkart page fallen?

No, we've seen that the number of users opening the app has remained steady. Only the bounce rate has changed.

Why does Flipkart have a home page? What purposes does it serve?

The purposes served by a home page are:

- It is the first point of contact for a user with Flipkart.
- It allows for easy navigation.
- It attracts low-intent users to see what Flipkart is offering.
- It makes people aware of new discounts, categories, events, and features.

CASE FLOW

Stage 1

1. The candidate should ideally segment the home page into sections and examine each section. To find the problematic section, the candidate would have to pick a particular metric, which reveals more information about the problem at hand.
2. The interviewer should encourage the candidate to think of possible metrics which would help her/him. It doesn't matter if the candidate doesn't know technical terms or definitions, what matters is that she/he understands what might help, and what won't. One metric that can be used is the click-through rate, defined as:

Click-Through Rate: The click-through rate is the ratio of users who click on a particular part of the page to the number of total users who visit the page.

3. Upon examining the click-through rate for various sections, the candidate should infer that the “Rest of Page” section has seen a decrease in click-through rate, and hence must be the problematic area.

Click-Through Rate across home page sections					
Year	Search	Navigation	Hamburger Menu	Bell Icon and Cart	Rest of Page
Last Year	28%	9%	11%	5%	47%
This Year	29%	10%	13%	6%	42%

Stage 2

Based on the information above, we can restate our objective. Our new objective is to now evaluate why the “Rest of Page” section has a lower click-through rate.

1. The interviewer can reveal, on questioning, that the “Rest of Page” section comprises of 4 parts:
 - 1) Advertisements: These are advertisements made by external companies on the Flipkart platform. These advertisements could be offers and other promotional material related to that company’s products.
 - 2) Merchandise banners: These are advertisements placed by Flipkart. Ads about the Big Trillion Day are examples of merchandise banners.
 - 3) Recommendations: These are products recommended specifically to the user. They are personalized recommendations.
 - 4) Games: Flipkart also has some games for users to play, which results in discounts if the user wins.

The percentage of the home page taken up by various sections is as follows:

Year	Ads	Merchandise	Recommendations	Games
Last Year	35%	45%	10%	10%
This Year	40%	40%	10%	10%

2. The above table indicates that the number of external advertisements on the home page has increased. This has happened due to an increase in demand by other companies to display their ads on the Flipkart platform.

The next step should be to analyze if the increase in ad space has any correlation to the increase in bounce rate.

Stage 3

To understand if there exists a correlation between the increase in ad space and an increase in bounce rate, we can again look at the click-through rates for ads and merchandise content.

Type	Click-through rate
External Advertisements	2%
Merchandise Banners	4%

It can be seen that ads have a lower click-through rate, and are hence clearly less desirable than merchandise content. Therefore, increasing ad space and reducing merchandise space on the home page must be the reason for the increase in bounce rate. At this stage, the candidate has successfully identified the problem, and can now go ahead and propose solutions. This should be done by delving deeper into each solution with the interviewer if deemed necessary by the interviewer.

Bonus Points: A clever bit of insight here is that though our bounce rate has increased, this may not necessarily be a bad thing. Flipkart now has increased revenue because it displays more ads, and this might be enough to offset the fall in revenue from the increased bounce rate. Therefore, a more detailed examination of these ads and their effect is needed, which need not be done here. However, a candidate may get brownie points with the interviewer if she/he can recognize these trade-offs.

CASE 2: SHOOT FOR THE STARS

Twinkle twinkle little star, our user ratings are so bizarre.

CASE STATEMENT

You are the product manager of Buber, Chennai. Unlike other areas, Chennai customers have shown a fascinating feedback behaviour. The data tells you that 50% of the customers rate drivers either 5 stars or 1 star only.

The data shows us the following:

Users	1 Star	2-4 Star	5 Star
Customer Segment A (50%)	40 %	0 %	60 %
Customer Segment B (50%)	20 %	60 %	20 %

What should we do about this?

PRELIMINARY QUESTIONS

How do we collect feedback from our customers?

After a ride is completed, we send them a push notification to rate the trip. A screen with 5 stars shows up, and the customer gives the rating. The customer can avoid giving a rating if they choose to.

Why is this information of concern to us?

Buber wants to increase its overall average rating. It's one of the company's metrics for user experience. We believe that by looking into this data, we can find a way to do so. (Bonus points for mentioning this as a question – Are we doing this to find out how we can convert these customers to give more 5-star ratings?)

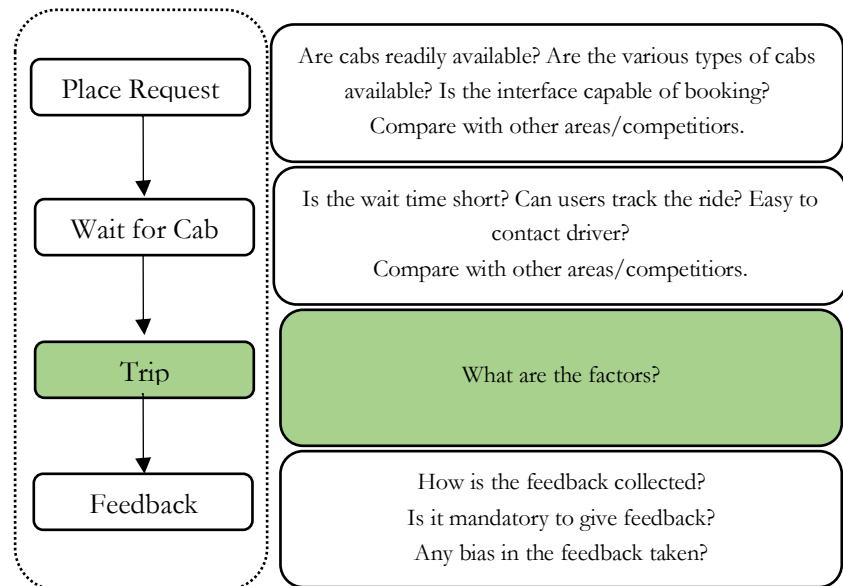
CASE FLOW

Stage 1

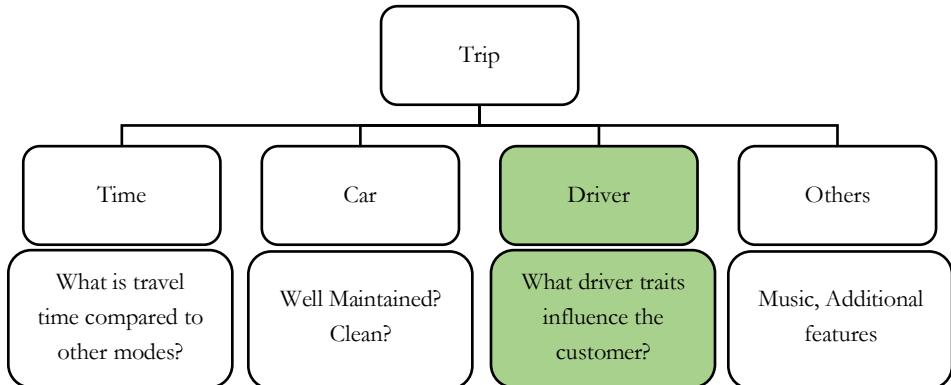
Identify the root cause:

1. We will first restrict ourselves only to the customer segment A as the behaviour is unique to them.

2. The erratic ratings can arise from:
 - a) The trip experience itself.
 - b) The way we collect feedback.
3. Let's look at the latter first. The candidate should examine each step of the feedback giving process (she/he can explore the Ola or Uber app for reference). While exploring it, the interviewer should highlight the following points:
 - a) The interface does not give room for detailed comments.
 - b) The scope for a user to commit an error while writing feedback is minimal. Hence, user ratings are an accurate measure of how they feel about the ride.
4. Next, let's look at the trip experience itself. A large number of positive and negative reviews indicate that a lot of users are either delighted or extremely disappointed with their ride. To understand why the candidate will need to analyze the trip experience in greater detail.
5. Break down factors that affect trip experience – this can be quickly done by looking at the process a user goes through during a trip – it will also ensure that you don't miss out on any factors. Given below is the user flow, along with a few questions that might be important for each part of the flow:



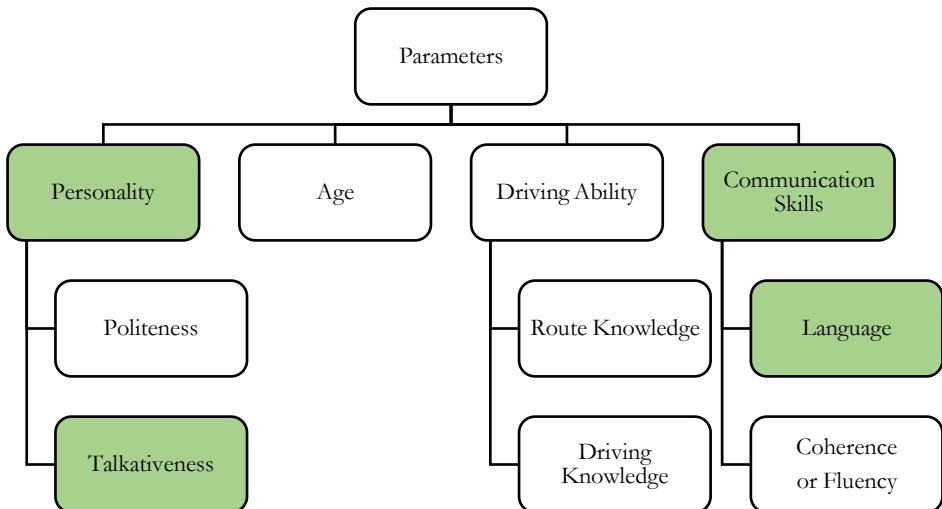
Flowchart 2: Factors that influence rating



Flowchart 3: Factors that influence trip quality

6. As shown above, the various aspects of the trip should be analyzed. The interviewer should encourage the candidate to be as detailed as possible while writing down the process. (**Note:** The candidate should write this down on her/his own, and the interviewer should not provide the flowchart above.)

7. Buber believes that they do well in most of the above areas. However, they would like the candidate to analyze their drivers further.
8. **(The “Aha!” moment in this case.)** Understand how the rating varies across drivers!
9. There are three segments of drivers:
 - a) Type A, who are rated 1 star by 85% of users.
 - b) Type B, who are rated 1 star by 50% of users.
 - c) Type C, who are rated 1 star by 15% of users.
10. Understand why the candidate should try to define the parameters of a driver that might affect the user.
11. Identify how to improve ratings, compare segment A and C based on parameters that decide a good and bad driver.



Flowchart 4: Factors influencing driver quality

12. We identify 2 differences between the 2 segments – Language and Talkativeness. Type C drivers generally know Tamil and are less talkative during the trip, while Type A drivers tend to be precisely the opposite.

Stage 2

Given here is an example solution for this case. Of course, the interviewer can expect the candidate to be much more creative than this!

Buber should adopt a 3-pronged approach to increase its average rating. It should:

1. Teach Tamil to drivers of type A. Extend the training to drivers of type B too, if it is proved that they get low ratings because of the same reason. Also, train them through workshops to better gauge a customer's mood, and accordingly adjust their tendency to be friendly.
2. Focus on choosing drivers who know Tamil while hiring new recruits.
3. Hold informational seminars to educate drivers on how to increase their ratings, so they take ownership of their own skill development.

CASE 3: WHY AREN'T PEOPLE WATCHING?

People are no longer looking at cat videos on MewTube. What's going on?

CASE STATEMENT

You are a PM at MewTube, the world's largest video-sharing website. Recently, you have observed that the average number of minutes of video watched by users has gone down. Figure out why this is happening, and find a way to turn it around.

PRELIMINARY INFORMATION

What do you mean by the average number of minutes watched?

More specifically, the metric we use is the average number of minutes of video watched per user per month.

Why is this metric important to us?

MewTube's revenue model relies on displaying advertisements to users during and between videos. Hence, we need users to spend more time watching videos to generate more revenue.

For how long have we noticed this drop?

The drop started 6 months ago and has gotten worse with every passing month.

Have we noticed this drop worldwide, or this is a region-specific phenomenon?

Though some regions tend to be less affected than others, the drop has been noticed worldwide.

Could you tell me a little more about MewTube?

MewTube is the world's largest video-sharing website and displays content in almost every category possible. It has by far the largest market share amongst all competitors in the video-sharing business. Content is uploaded by channels and can be watched by anyone.

Who are our competitors? Have they faced a similar drop in minutes watched?

Our largest direct competitor is another video sharing platform called Bimeo (~10% market share). People often share videos on social media platforms as well. We were unable to obtain information regarding the minutes watched from our competitors.

CASE FLOW

Stage 1

1. Try to break down the metric. The metric can be written as:

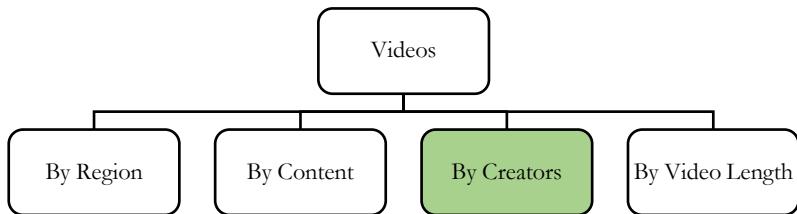
$$\text{Average number of minutes watched per user per month} \\ = \frac{\text{Total minutes of videos watched in a month}}{\text{Total number of users}}$$

2. We have observed that there has been a drop in both the number of users and the number of videos watched. Let us next look at the numerator of the equation:

Total minutes of videos watched in a month

$$= \sum (\text{Number of videos} * \text{Avg. length per video})$$

3. We have observed that the average length of a video has not decreased, but the number of videos being watched per person has gone down.
4. At this point, the interviewer should encourage the candidate to think of factors which would result in the users watching fewer videos. This can be done by segmenting them into different categories. A few ways to look at the types of videos (not exhaustive by any means) are:



Flowchart 5: How to breakdown the type of videos

The fall has been uniform across regions, content, and videos of various lengths. Across different types of channels; however, we see the following variation:

Type of channel (based on popularity)	Large (popular) channels	Medium channels	Small (upcoming) channels
Impact on the number of videos watched	No Change	Small drop	Large drop

- To understand why this variation has occurred, the candidate should think of factors which affect the chances of a video being watched. One way to do this is to write down the interaction flow of a user with MewTube, and pick out factors at each stage of this process.
- Upon doing so, it has been observed that small and medium channels are no longer putting up fresh content on MewTube, and hence, users are no longer watching videos from these channels.

Stage 2

At this stage, we can redefine our problem statement to find out why small channels are no longer uploading videos on our platform.

- To understand why let's look at the motivation to upload content on MewTube.

2. Creators have 2 primary motivations – reach and revenue. ‘Reach’ refers to the number of people they can reach out to and the recognition they get from reaching out, and revenue is the money they get paid by MewTube, sponsors and others for putting up content.
3. Reach is especially vital for small and medium channels, as they see MewTube as a platform to launch their careers.
4. On questioning, the interviewer should reveal that MewTube has made no change to its policies or algorithms over the last 6 months.
5. However, a rival social media platform – Mewstagram, has recently adjusted its policy and is now boosting videos made by small and medium channels. Videos hence get a lot more reach on their platform than they do on ours. This has resulted in content creators moving away from our channel to theirs.

At this point, the root cause has been identified, and the candidate can look for solutions. We are not elaborating on the solutions here, and leave it to the interviewer’s and candidate’s creativity.

CASE 4: ANYTHING FOR EXTRA CREDIT

You've finally got the opportunity to impress your boss, are you up to the task?

CASE STATEMENT

You are a PM at the food delivery company "Jomato." You've been asked by your CEO to improve the product dramatically, using minimum capital. What do you do?

PRELIMINARY QUESTIONS

What is the product here? What are the current services the product offers?

Great question. Jomato is a food delivery app. Customers look at partner restaurants on our app and order food from them online. We pick up the order from the restaurant and deliver it at the user's doorstep. This entire experience is the "product" we offer to customers.

Jomato also provides discounts if customers eat at certain restaurants, but we shall not examine the same in this case.

What do you mean by dramatically improve the product? Is there any specific problem? What metrics would decide if a product has improved?

We're open to any and all ideas which would help improve our product. We believe our efforts would be the most effective if we improve the user experience. The specific metrics would depend on the area you choose to grow, but broadly, we're aiming to enhance customer satisfaction.

What does minimum capital mean? Am I allowed to use the existing employees and teams in Jomato?

We are willing to incorporate any changes you propose, as long as they do not involve substantial investments from our side.

Where is Jomato based?

Jomato is India's largest food delivery platform and has a pan India presence.

Who are the stakeholders in the product?

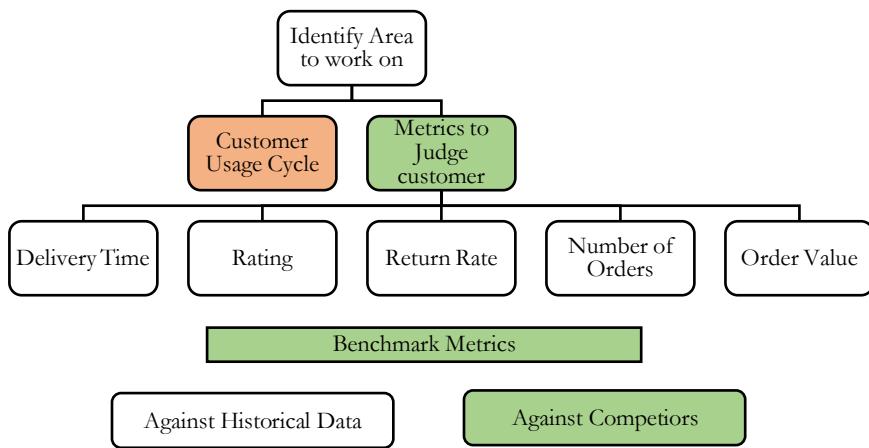
For the purpose of this case, there are 3 stakeholders – Jomato, the restaurants, and the users. The delivery men are employees of Jomato.

How is the company doing currently?

Jomato is in a growing phase. We wish to retain our existing customer base, acquire more customers, and increase the number of orders we complete every day. We face stiff competition from other food delivery companies.

Who are other players in the market? How are we placed in the market?

Twiggy and Guber are the other 2 major players. Jomato enjoys a 40% market share, followed by Twiggy at 30% and Guber at 10%. The rest of the market is fragmented and is occupied by smaller players.



Flowchart 6: Identify area to work on

CASE FLOW

Stage 1

The first step is to identify an area to work on. You can identify this area in two ways:

1. Since we are trying to improve user experience, we can look at the various ways in which a user interacts with our app (also called the customer usage cycle).

Why Benchmark?

Benchmarking is an important way to judge if your product is performing well. In the real world everything is relative, and hence the best way to judge your product is to benchmark it both over time (see if it is improving) and with its competitors (are you lagging behind?).

2. Look at the metrics that decide “success” for Jomato and benchmark them against 2 things - historical data and competitors. The interviewer should drive the candidate to take this approach.

There have been no significant variations in these metrics over the past year for Jomato. The table below shows how Jomato does compare to its primary rival, Twiggy. The market has been split city wise, as the factors that affect delivery time (such as traffic, infrastructure, etc.) are similar for all cities in a particular tier and different for cities across different tiers.

Delivery Time

	Company	Tier 1 Cities	Tier 2 Cities	Tier 3 Cities
Market Split	Jomato	60%	30%	10%
	Twiggy	60%	40%	0%
Average Delivery Time	Jomato	32	30	45
	Twiggy	31	29	NA

After calculating the average delivery time, it can be noticed that the difference is small. Hence, this area need not be improved upon and should be abandoned.

Return Rate

The return rate is defined as the average time between 2 consecutive orders from a user. It's important to us as a lower return rate means a higher frequency of ordering from a user. We've seen that, on average, Jomato has a 160hrs return rate, while Twiggy's is 140hrs.

This difference is significant, and the interviewer should guide the candidate to look into this further.

In terms of ratings, order value and several orders, we are either on par or doing better than competitors. These metrics have also been continually improving over time.

Stage 2

Now that a target area has been identified, we can now dive deeper into it. To understand why Twiggy has a lower return rate, we compare Jomato's and Twiggy's models for orders. The models are:

Jomato offers discounts at various restaurants at different rates. Discounts are in 3 ranges, the 0-20% range, the 20-40% range, and Mega Offers ($>40\%$ off).

Twiggy offers no discounts but has a loyalty program which provides guaranteed cashback (the money gets added to your Twiggy wallet) with every order.

To see which model is more effective, the interviewer can provide the following information:

	J (0-20% disc.)	J (20-40% disc.)	J Mega Offer	Twiggy Credit
Funds allocated as a percentage of total discount	20%	40%	40%	33.5%
Effectiveness	0.12	0.20	0.15	0.17

From the information above, the candidate should infer that Twiggy's model is more effective and cost-effective than Jomato's, and hence Jomato can look at switching from a discount-based model to a loyalty one, like Twiggy. Other solutions and recommendations can be proposed, as well.

PRODUCT-THINKING CASES

INTRODUCTION

Congratulations on completing/skipping problem-solving cases, and welcome to the next type of interviews – Product Thinking! One of the crucial skills you need as a PM is the ability to come up with creative solutions. Building products that users will love only happens when you truly understand their problems, and deeply empathize with their needs. In short, here are the four things you'll need to master product thinking cases:

1. **Scope:** Understand the scope of your case well. A common mistake that beginners make while solving product thinking cases is that they jump straight to the solution. Accurately understand the type of product you're building, and the users you're building for. For example, if your case is to “Design a cap for old people,” a few of the questions you should be asking yourself are - why are we designing caps for old people? What does “old people” even mean, are they people above 65? Are we looking at urban old people or rural? Old people in India or abroad? Are we targeting rich people or poor people?
2. **Empathize:** Empathize with your end-user. You won't be able to come up with good solutions to help your users if you don't understand their behaviour, their struggles, and their joy. Understanding them well can do wonders for you and your product.
3. **Identify:** Identify a few key areas where you can provide value to your end-users.
4. **Ideate:** Come up with solutions to solve your user's problems. The key here is to think simple. Very often, candidates tend to get carried away and propose complicated, intricate solutions for straightforward problems. The irony is that though candidates do this to impress the interviewer, it often results in the opposite. There

are no brownie points for coming up with complicated solutions. However, simple solutions that address the user's need will fetch you ample praise.

All product thinking cases will test all 4 skills, in some sense or another. However, different cases will test these skills to different extents – for example, some product thinking cases may focus entirely on scoping out your problem. (E.g. What country should we launch our next product in? What kind of users should we be targeting to make the most profit?) Explore the different apps you use on a daily basis and observe the different features they provide, as this might help you ideate during a case. And most of all, have fun solving the upcoming product thinking cases!

CASE 1: COME BACK SOON

To get users to pay, find a way to make them stay.

CASE STATEMENT

You're a PM at PayPM, India's largest e-payment app. PayPM wants its users to spend more time on the app and are hence looking for ways to better engage with their users. How would you achieve this?

PRELIMINARY QUESTIONS

Why do we want people to spend more time on our platform?

We have noticed that people open the PayPM app only when they have a specific transaction in mind - for example when they want to transfer money to a friend or pay at a store. We now want to set up an engagement platform to tap into low intent users, that is, users who open the app to view something else, but end up making a purchase.

I'm not sure I understand what you mean by an engagement platform. Could you please elaborate further?

Sure. Instagram, YouTube, and PUBG are all examples of engagement platforms. Users open these apps to be engaged and not to buy something. However, as they use the app, they may eventually end up spending money (by clicking on advertisements on Instagram, purchasing movies on YouTube or in-game purchases in PUBG). People generally spend larger amounts of time on engagement apps than they do on PayPM. Hence, PayPM too would like to transition into an engagement platform, but we haven't figured out how we'd like to engage our users. That's what we'd like you to figure out.

What does the PayPM app currently do?

The PayPM app is an e-wallet. Users can add money to the e-wallet, and then transfer this money to each other. Users can also remove money from the wallet and transfer it back to their bank account.

How does PayPM make money?

PayPM currently makes money in 2 ways:

1. We charge a transaction fee for every transaction that gets completed through our app. This fee is usually 2% of the transaction value.
2. We display advertisements on the PayPM app. We charge companies for placing their ads in our app.
3. PayPM also makes money by investing the money that users store in their wallets.

Could you tell me a bit more about PayPM's users?

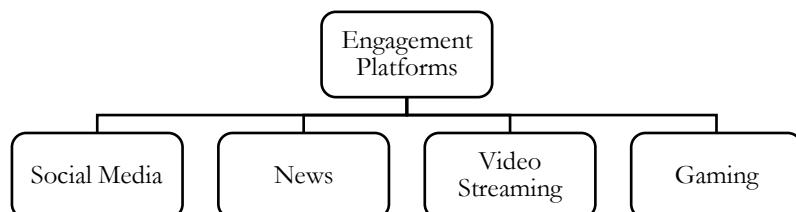
PayPM's users are generally young Indians – between 15 to 35 years of age. Our app is quite popular amongst users from both urban and rural areas.

CASE FLOW

Stage 1

The first stage is to find the various types of engagement platforms. One way to find out is by looking at what engagement apps are popular amongst existing PayPM users.

On being asked, the interviewer can reveal that the following kinds of platforms are popular amongst our users:

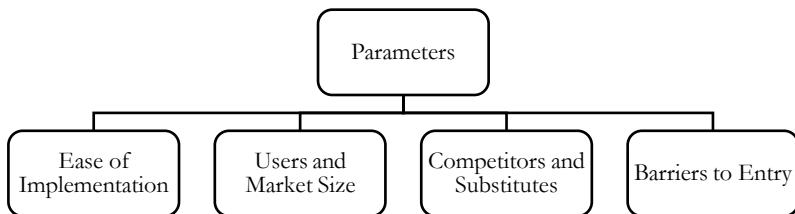


Flowchart 7: Types of Engagement Platforms

Stage 2

The next step is to choose a platform for us to adopt (from the above options). To do so, we need to define some parameters, which let us compare the different kinds of platforms and choose the appropriate one.

The interviewer should encourage the candidate to think of relevant parameters. Some examples are:



Flowchart 8: Parameters for evaluating engagement platforms

Note: There are a large number of factors that may be considered for each of these parameters. The aim of this interview is not to analyze each parameter and possibility in-depth, as that is not possible in the time given. However, the candidate should be able to recognize broad factors that matter and be able to keep track of the larger picture.

Stage 3

Finally, the candidate should examine each platform through these parameters and choose the appropriate one. One way to do that is as follows:

1. The candidate should understand the platform well. For example, what does social media include? By video streaming services, do we only mean video sharing services like YouTube, or content streaming services like Netflix and Amazon Prime as well? Understanding the platform first is integral to being able to solve this case.

2. Next, the candidate should examine each option using the parameters chosen. For example, competition is an important parameter to look at while considering social media – as the current players have a monopoly over the market. Similarly, each potential engagement platform must be scrutinized using the parameters chosen.
3. Once a platform has been examined using the given parameters, the candidate and interviewer should come to a joint conclusion on whether it is feasible for PayPM to adopt that platform.

Given below is a brief analysis of each platform:

1. Social Media

Some examples of social media companies are WhatsApp and Facebook. After some discussion, the candidate should discard this platform. There are many compelling reasons to discard it, and a few of them are listed below:

- a. Barriers to entry: Social media companies rely on the network effect. The value of social media platforms increases as more users join it, and hence, it would be challenging to disrupt existing social media companies who already have millions of users.
- b. Competition: The market is mostly monopolized, with 1-2 apps in each segment (WhatsApp for messaging, Instagram for pictures, etc). These companies have deep pockets and considerable expertise in this market, and it would be challenging to try and grab market share from them.

2. News

News platforms are of 2 kinds – content creators (like the Times of India) and news aggregators (like Google News). It is more resource and skill intensive to set up a content creation platform than a news

aggregator platform. The market for both these platforms is highly segmented, with no player having a clear advantage or monopoly. There are no significant barriers to entry. News is something that appeals to a wide variety of Indian users as well.

Based on the above key points, it can be concluded that news can be looked into further. However, the candidate should not neglect the last 2 platforms, and the interviewer should guide the candidate to explore these (video streaming and gaming) as well.

3. Video Streaming

There are 2 kinds of popular video streaming applications:

- a. Content streaming services like Netflix
- b. Video sharing apps like YouTube

We can discard becoming a content streaming service like Netflix due to the complications in creating original content to stream. The market is also highly competitive, with a bunch of established players burning money in a cut-throat fight to establish dominance.

Barriers to entry and competition are significant problems with becoming a video sharing platform (like YouTube). Video sharing platforms have a virtuous cycle – as more users use the platform, more content creators upload content on it. And as more content creators upload content, more users get drawn to the platform. This is the reason for YouTube's monopoly of the segment, and this makes it difficult for new entrants to enter the market.

4. Gaming

There are 3 types of popular games in India:

- a. Viral games: These include games like PUBG, Pokemon Go, etc. These games require considerable investments to create and are often played by millions of users. While they generate vast amounts of

revenue, their popularity is usually short-lived, with a new game becoming the next big sensation, every 1-2 years.

- b. Gambling games: These include games like Poker, Rummy and Fantasy Sports. They are widely popular amongst young users. There are no significant players in this market, and no big brands either.
- c. Evergreen games: These include games like Ludo, Snake, and Ladders, TicTacToe, etc. A lot of users across age groups play these games. There are no significant players in this market.

While the first category of games (viral games) can be ruled out due to high investments and no guaranteed returns, the other 2 categories are definitely feasible. The interviewer and candidate can choose to discuss the impact of these games on their brand image.

Stage 4

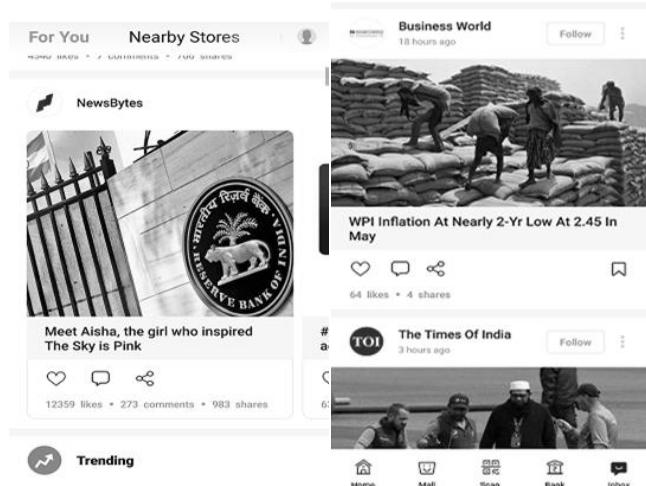
Now that the candidate has identified specific segments, she/he should put some thought into how PayPM can make money from launching these segments. Some examples include:

- **News:** Banner ads, paid articles
- **Gaming:** Entry fees, cash backs, and rewards for users who participate in PayPM game tournaments.

Once these have been discussed, the candidate can go ahead and summarize the case.

Note: As of June 2019, the Indian e-commerce payments company Paytm has ventured into news aggregation and gaming. Check out the screenshots below, and explore the app too!

PREPARING FOR PRODUCT INTERVIEWS



CASE 2: PHONE IT IN!

Let's make a phone!

CASE STATEMENT

Jipkart wants to introduce a phone into the Indian market. What type of phone should they introduce, and how should they go about doing it?

PRELIMINARY QUESTIONS

Why does Jipkart want to introduce a phone in the Indian Market?

We noticed that the demand for phones in India is currently growing. Hence, this currently seems like a lucrative market to enter. There are a variety of benefits Jipkart can gain by entering the market. Maybe we should look at these aspects in more detail, during the case.

Can you explain both the phone and e-commerce market spaces in India currently?

The e-commerce market has Jipkart as one of its major players. The other major player is a company called Jamazon. It is an international player.

The phone market can be broken into several divisions:

- Normal Phones: Nokia and Jio are the major players here. (Phone prices < Rs.3000)
- Smartphones Cheap: Moto, Old Samsungs, Oppo, Vivo. (Phone prices < Rs.6000)
- Smartphones Mid-Range: Mi, Oppo, Vivo, Moto. Phone prices (Rs. 9000 – Rs.15000)
- Smartphones Luxury: One Plus, Apple, Samsung, Pixel. (Phone prices > Rs.15000)

What type of phone are they planning on introducing? How do they want to introduce it to the Indian market?

These can be decided by you, as long as they are in line with Jipkart's goals.

What are Jipkart's goals?

We can break down the company's goal into 2 parts:

- Monetary – Profit
- Non-Monetary – This can be broken down into Customer and Competitors. Our customer specific goals are: 1) Increase market share by tapping into new market segments and exploiting synergies. 2) Improve brand image. We also wish to differentiate ourselves from competitors, and we believe that it is a unique proposition for an e-commerce brand to have its own phone.

CASE FLOW

Note: The interviewer should guide the candidate to prioritize access to new market segments and brand image development over profitability.

Stage 1: Who is the Customer? What do they want?

Who is the customer?

To better understand the kind of phone we need to build, we need to first understand the people we are building for.

We can target two possible customer segments:

- Customers not in the e-commerce market
- Customers who currently prefer competitors

Jipkart's current priority is to reach out to new users, who have not yet been introduced to e-commerce. These users are predominantly from tier 3 cities and rural areas. Hence, the interviewer should inform the candidate to focus on potential customers with these backgrounds.

What does the customer want?

After some discussion with the interviewer, the following should be identified:

-
- Native language on the phone

- Provision to watch YouTube videos
- Basic call/messaging
- WhatsApp
- Cheap (Price range < Rs.2000)

Based on this, the candidate can quickly describe the kind of phone that needs to be made.

Stage 2: Phone making process – Company end

The candidate should look at how to set up the supply chain for making of this phone. They should identify two things:

- Manufacturing needs to be outsourced (Setting up a plant in India would require a lot of capital and skill).
- Logistics/distribution: This is already mostly set up, as Jipkart is an e-commerce platform.

Stage 3: Should we do it?

At this point, the candidate should do a cost-benefit analysis for the phone. The interviewer should let her/him know that profits do not look lucrative when we match the current market price point set by competitors. In addition, the interviewer should help the candidate qualitatively estimate the amount of market share Jipkart can hope to capture by this venture. Now the interviewer and candidate should briefly discuss market share gain vs. profitability of venture to decide whether or not this is a good initiative.

From here, the candidate can conclude to both make/not make the phone.

CASE 3: CASHING IN

The dictator of Wadiya no longer wishes to use gold as the country's currency. Help him design a new currency.

CASE STATEMENT

Design the currency notes to be used instead of gold by Aladeen and his country.

PRELIMINARY QUESTIONS

What is the purpose of the currency notes? (You never know what money is used for in Wadiya)

It needs to be able to do the following:

1. **All** citizens of Wadiya should be able to use it to buy/sell goods and services.
2. It needs to brand the honorable dictator of Wadiya .

Are we considering coins? Do I have to propose the different denominations of notes required as well?

Let us consider only currency notes for now. You can assume that the denominations have already been decided, and this need not be discussed in this case.

CASE FLOW

Stage 1: Identifying use cases

Currency notes can be designed by looking at their various use cases; i.e., all the situations in which currency notes are used. This can be identified in different ways. The easiest way to do this is to look at the 'life cycle' of a currency note; from printing to distribution to being removed from circulation and disposed of. From this discussion, you can ascertain that one must be able to do the following things with currency notes:

1. Be able to print (create) currency notes easily.

2. Be able to store currency easily.
3. Be able to exchange currency easily.
4. Be able to identify currency easily (uniqueness, unforgeability, and accessibility).
5. Be able to be destroyed easily (destruction post removing from circulation).

Printing

A discussion should reveal the following factors for printing:

- Shape of the note:
 - Rectangular in nature (This makes it easier to print multiple copies on one giant sheet of paper. Any tessellating shape should work. Also, it is easier to procure molds for, as it is the most conventionally used shape.).
 - Thin and 2D (It is easier to print on 2D surfaces)
- Material of the note:
 - Cheap, easily available material.
 - Environment friendly (not a part of the purposes behind creating the note, but a good add-on anyway).
 - Durable, waterproof.
 - Lightweight.

Storage

The following factors should be touched open

- Size of note:
 - Wallet sized/pocket sized notes.
- Wear and tear:
 - Should not get wet, burnt or torn.
 - Should last for long durations of time.

Exchange

- Size of note: Should be sized so that it can be picked up and transferred using one hand.
- Notes should not stick to one another.
- The denominations should be easily distinguishable from one another. Some ways to do this could be:
 - Different colours for different denominations.
 - Different sizes for different denominations.
 - The value of the note should be clearly visible on both sides, and upon folding the note.

Identification

Some of the features that can be used to prevent forging and to make note unique are:

- Unique ID for each note.
- Colour changing band.
- Signatures.
- Intricate detailing – Check out the features used in Indian currency notes to prevent forging.

Accessibility

Currency notes should be usable by all citizens of a country. While designing notes, the candidate may often make implicit assumptions about the users of the note (such as the users are literate and can read the value on the note, or that the users have good eyesight and can hence distinguish between various colors). Therefore, this section is important, as it helps the interviewer see if the candidate can remove her/his implicit biases, and design the note for various types of users. Some user groups to take care of are:

1. Blind Individuals
2. Illiterate individuals

3. Amputees: Currency notes are usually exchanged by hand. How does one design a note that can be easily used by amputees?

Destruction

The destruction of the note should be environment-friendly and economical. It should be destroyed by a special process which cannot be replicated by daily wear and tear or natural circumstances.

Synthesis

Design something that looks like any current currency. Make sure you discuss ways to show Wadiya's glory on it. Check out the features of your currency note to get a better idea.

CASE 4: PARENTAL GUIDANCE

Research shows apps can app-parently help parents look after their kids better.

CASE STATEMENT

Design an app to help parents better monitor their children.

PRELIMINARY QUESTIONS

What aspects of the app do I need to focus on?

We want you to come up with the features this app should have. No need to look at other aspects like pricing, implementation, etc.

What kind of families is this app meant for? Are we only targeting primary school children?

Do these children have access to smartphones?

The app is meant for middle-class families to use, with the children being between 3-12 years of age. We shall assume that each child possesses a smartphone which she/he actively uses and carries around.

What do you mean by monitor? What use cases are we looking at here?

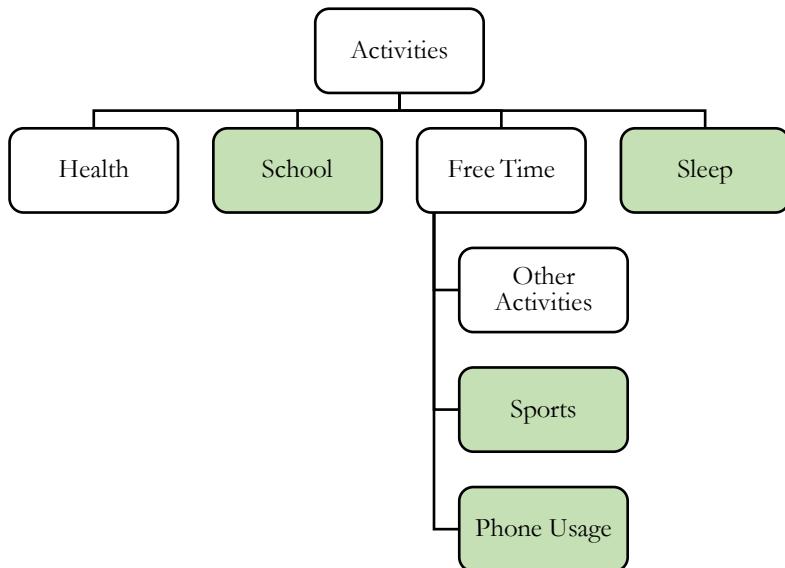
That's a great question. One of your objectives, in this case, should be to list down what use cases would be helpful for parents.

CASE FLOW

Stage 1

The first task is to empathize with the customers (parents) and understand their needs.

- The interviewer should ensure that the candidate is thorough while listing down needs. One way to do so is to list out all the activities children do throughout the day, and then pick the ones which parents are concerned about.



Flowchart 9: Activities parents are concerned about

- Out of these activities, it has been observed that parents are primarily concerned about 3 things:
 - Going Out: Parents are concerned about the whereabouts of their children when they're outside – i.e., while going/coming from school and while playing sports
 - Phone Usage: Parents are concerned that their children spend excessive time on their mobiles during their free time.
 - Sleep: Related to the point above, parents are concerned that children are using their phone while they are supposed to be asleep, and this is affecting the quantity and quality of their sleep.

We have now identified areas for the candidate to focus on. She/he can now go ahead and analyze each segment.

STAGE 2

Before we think of app features for each area (like safety, etc.), we need to know what our constraints are. It would be a good idea to first be aware of all the aspects of a smartphone an app has access to, before designing features. The interviewer can encourage the candidate to open Settings on their mobile devices and check app permissions before beginning. Some useful app permissions are listed below:

- Motion Sensors (accelerometer, gyroscope)
- Calendar (can read, create, edit and delete calendar events)
- Camera (photo and video)
- Contacts (can read, create, edit and delete contacts)
- Location (accesses location through GPS, cellular data or wifi)
- SMS (read, receive and send SMSs)
- Microphone (for recording audio)
- Phone (provides access to your phone number and network info.
Can also redirect, block, and make calls.)
- Storage (read or write files to your phone's storage)

Note: The candidate is not expected to know all this information. The candidate can check the app permissions on their phone, and the interviewer can share this information with the candidate as well.

Stage 3

To come up with features for each area, the candidate can do the following:

1. Try to segment each area further. For example, phone usage could be analyzed based on the type of apps used.

2. Write down parental concerns for each segment. For example, parents may not be comfortable with children using certain types of apps (like gaming apps), or the amount of time they use specific apps for (such as video streaming or social media apps).
3. Think of features to address each concern.

Given below are some example solutions:

Going Out

1. Setting up a geo-fence for the child. If the child steps outside the area marked on the map by the parent, the parent receives a notification and the child's current location.
2. Notifications if the phone's battery is about to die, to warn parents that they may soon be unable to contact their children.
3. Notifications if the child is not at a particular location (such as school, sports coaching, etc) at specified times of the day.
4. An SOS alert option. If the child presses the SOS button, parents are immediately sent the child's location. The app also records, saves, and transmits microphone data to parents, for them to better understand the situation.

Phone Usage and Sleep

1. Notifications whenever a download is made from the app store. (Alternately, blocking all downloads from the app store unless permission is granted from parents)
2. Blocking apps after they have been used for a specific amount of time (specified by parents)
3. Allowing access to apps at specific times of the day and blocking them during other times.
4. Blocking access to all apps during designated sleep hours (specified by parents).

5. Tracking what contacts are called and how long calls are for. Option to block calls/messages from specific contacts or unknown numbers.

TECH UNDERSTANDING CASES

INTRODUCTION

Good job on making it this far. You've reached the final case interview round, the tech case. It's completely alright if you're from a non – computer science background, these cases *are not meant to test your coding skills*. Instead, they test a more fundamental skill, a skill that's prevalent amongst all engineers – curiosity. Again, we repeat. These cases will NOT test your coding skills. They will test your ability to figure out how various products and systems work. That's a skill that all engineers are ingrained with, regardless of the field of engineering they pursued.

Tech cases (also called system design cases) dive into how products are built. For example, how is WhatsApp designed? How was Google Maps made? These questions may seem really intimidating at first, and that's completely alright. None of these products were built in an hour, and hence the interviewer does not expect you to be perfect or get into the details of it. Instead, they are just looking for your ability to break down big hairy problems into small manageable chunks, which can then be built by engineers.

Things to keep in mind for tech cases:

1. The questions are broad. Make sure you ask a lot of clarifying questions and define the scope of the case. Remember, great products weren't built in a day and you aren't expected to do that either.
2. Ask questions in the beginning. Figure out what features you want to incorporate into your product, and what you should leave out. Don't make assumptions about what the product should do.
3. In an ideal world, features operate in the same conditions all the time. In the real world however, the user may be in all sorts of

environments while using the product (For example, the user may have bad data connectivity while using an app.). Hence, keep in mind the general conditions (a good, stable internet connection) as well as outliers (sudden loss of network), while designing features.

4. Just like other cases, tech interviews should be conversations. Actively engage with your interviewer and ask them if you're on the right track. Your interviewer will guide you through the case
5. You improve at system design questions by knowing more about the world. Be curious and find out more about the tech you use every day.

To help you learn more about the various products you use every day, we've added a few Tech Titbits after the cases, which briefly explain how certain products work. Make sure to further research the topics you like, as this will help improve your preparation by leaps and bounds!

CASE 1: HOW DOES WHATSAPP WORK?

A simple dive into one of the most useful creations of our time.

CASE STATEMENT

Design a messaging service like WhatsApp.

PRELIMINARY QUESTIONS

What features are we looking at?

The messaging app should have the following features:

1. One-to-One text: Users should be able to send text messages to each other.
2. Sent/Received/Read:
 - a. The message should show sent (single tick) when it has been sent from the user's phone.
 - b. The message should show delivered (double tick) when it has been received by the recipient's phone.
 - c. The message should show read (blue double tick) when it has been seen by the recipient.
3. Last Seen: The app should show when a particular user last used the messaging app.

How many users do we have? What scale are we looking at?

The app should support around 450 million daily active users, sending approximately 2 billion texts every day. However, for the purpose of this case, we shall not go deep into scaling.

Should I look at app design as well?

Let's only look at the backend architecture, and not concern ourselves with app design.

Does the messaging service support media files?

No, let us assume that it only supports text.

Does the service support group chats?

Let us assume that it shall only support person-to-person messaging, with no group chats.

Should the service have a web application as well?

Let us assume that we are restricting ourselves only to a mobile phone app.

Does the app use the internet or send SMSs using cellular networks?

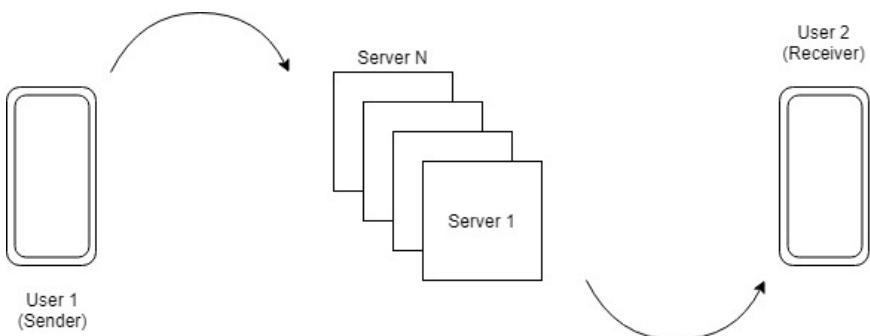
Let us assume it's an internet-based messaging app.

CASE FLOW

For the sake of this case, let's assume there are 2 people – the sender of the text message S, and the receiver of the message R.

Stage 1

Feature 1: One to one text:



1. Asynchronous texting: The candidate should realize that users may not be online at the same time. Messages might be sent from a user when the recipient is not online. Similarly, when the recipient is online, the sender of the message may not be online.
2. Hence, the candidate should infer that one would need an intermediary computer (a server) to store messages when the receiver is not online. *Once the candidate has understood this, the interviewer*

should specify that the server need not store the messages, once the recipient has received them.

3. Order of messaging: The recipient should receive messages in the same order as it was sent by the sender. Hence, the server would need to send the messages in the same order. The server can create a queue in its memory for every user, with messages that were sent to that user first, being delivered to the user first. This queue follows the First In, First Out principle.
4. Scaling: While we won't go deep into scaling in this case, the interviewer can give it a passing mention. The candidate should realize 2 things:
 - a. A single server will not be enough to handle all the traffic.
 - b. Instead of creating one server with substantial computational power, it makes more sense to have multiple servers. This way, in case one server shuts down by accident, the app can still run.
 - c. Ensuring messages reach the recipient in order becomes more complicated if there are multiple servers. However, once the candidate has realized this, the interviewer need not go into further detail about ensuring they arrive in the right order.

Stage 2

Feature 2: Sent/Received/Read

1. Sent: The server should reply with an acknowledgment on receiving the message from the sender. Upon receiving the acknowledgement, the app can show a single tick for the message.
2. Received: The sender can receive the double tick icon only once the receiver has confirmed that it has received the message. Therefore, an acknowledgment must come from the receiver whenever it

comes online, and this has to be sent to the sender when the sender comes online. Thus, the Double Tick can be thought of as a special kind of message. Every time the recipient receives a message, the “Double Tick special message” gets sent to the server. The server adds this special message to the sender’s message queue. When the sender comes online, it receives the message, and the app shows it as a double tick.

3. Read: The read feature can also be thought of as a type of special message sent from the recipient’s phone every time they open a particular chat. It would follow the same procedure as the received message.

Stage 3

Feature 3: Last Seen

The last seen feature displays the time at which each contact of a user last used the app.

1. User side: Each user continuously sends a “Last Seen” message to the server, letting it know that they are online. The message can be a single bit letting the server know that the user is online. This message can be sent at a fixed interval (like 5 times every minute). (These messages are called heartbeat messages as they’re sent at regular intervals and let the server know that the user is “alive” aka has a heartbeat.)

Note: It is not sufficient for the user’s app to only send the time at which the user came online and the time at which it went offline, as the user might go offline abruptly. If that happens, the user would not be able to communicate to the server that it’s gone offline.

2. Server-side: The server has a table with each user and their “Last Seen” timestamp. As the server receives the “Last Seen” message

from the user, it continuously updates the table with the time at which it received the Last Seen message.

3. Displaying the Last Seen time: Each user's app sends to the server a list of users for which it needs to see the Last Seen time. The server accordingly retrieves the information and sends it to the user's app, allowing it to display the Last Seen time in an appropriate format.
4. Once the candidate has solved for these 3 features, she/he may summarize and close the case.

CASE 2: GOOGLE MAPS

Navigate your way through the technical underbelly of Google Maps.

CASE STATEMENT

Design an app-based maps service, like Google Maps.

PRELIMINARY QUESTIONS

What features of Maps should the app support?

The app should support the following features:

1. A user should be able to find their location on the map.
2. Given a source and a destination address, the app should be able to find the fastest route from source to destination (for a car).

How detailed should the map be? Are we trying to be as detailed as Google Maps?

Keep the map as detailed as you can. This will however, depend on your data collection methods, which we shall discuss in the case.

CASE FLOW

This case involves a lot of assumptions, to simplify the case solving process. The interviewer should encourage the candidate to make these assumptions, in case the candidate gets stuck or needs some clarifications to proceed with the case.

Stage 1

Feature 1: Finding a user's position on a map.

This process involves 2 things:

- Building a map.
- Calculating and showing a user's position on the map, based on their GPS coordinates.

Let's look at these individually:

Building a Map

1. The candidate should look at 2 things here:
 - a. Sources of data for making the map.
 - b. Representation/storage of the map in the database.
2. The candidate should think of and propose sources of data for building a map. Here are some avenues Google uses to collect map data:
 - a. Civic authorities
 - b. Satellite data
 - c. Crowd-sourced data:
 - i. Users can pin locations on the map and label them.
This is especially useful to keep the map updated.
 - ii. Using GPS coordinates. By knowing the GPS coordinates of people using maps, Google can better understand which roads are one-ways, which roads have signals, etc.
 - i. Cars with cameras: Google drives cars around with cameras on them. This helps them collect data for street view as well as collect map data.
3. Storing the map: The map can be represented as a graph, with buildings, lakes, intersections and other spots as nodes of the graph. Roads form the edges (the connecting lines) of the graph.

Locating a user on the map

1. The candidate should realize that the entire map cannot be loaded onto a user's phone.
2. The map should store data about each building and road on its database, such as the start and end GPS coordinates, etc.
1. Based on the GPS coordinates of the user, a certain section of the map (the candidate can assume say 2km x 3km) around the user is

retrieved from the database and loaded on the phone. Then, the GPS coordinate of the user is pinned on this map.

Stage 2

Feature 2: Finding the shortest route between a start point and an end point on the map.

1. The first thing to realize here is that the entire map cannot be searched for an optimal route, as this process is unnecessary and would simply take too long.
1. The candidate can discuss various ways to choose a section of the map for searching with the interviewer. It is believed (but not confirmed) that Google draws a line between the start and end point, and then chooses all roads within a pre-specified distance of that line. This map is then searched for an optimal route.
2. Each road (graph edge) is assigned a weight, based on how fast one can travel on that road.
3. These weights are assigned in the following ways:
 - a. Based on the speed limit of various roads
 - b. By gathering traffic data. This is crowd-sourced.
 - a. Historical data (gathered by analyzing day-to-day data)
4. For the sake of this case, let us assume that there are no one-way roads, and that additional issues like traffic lights are accounted for in the weight assigned for each road.
2. Once you have two nodes on the graph, Djikstra's algorithm can be used to find a path between them. *Note that the candidate need not know how Djikstra's algorithm works.* It is recommended that readers look up a brief explanation of the algorithm later, if interested. (The actual algorithm used by Google is believed to be a variation of Djikstra's called the A Star algorithm.) The candidate can assume

that there exists an algorithm for finding the shortest path, and proceed with the case.

3. The interviewer should mention that one problem with Djikstra's algorithm is that the time it takes to give you the shortest path increases greatly as the size of the map increases. Hence, the interviewer should guide the candidate to come up with a different approach, in case the start and end points are far from each other. (For example, if Maps is used to go from one city to another.) Given below are the approaches for calculating fastest path, based on how far the source and destination are:
 - a. Short distances: Use Djikstra's algorithm to find the optimal path.
 - b. Long distances: Maps first sends you to the closest major road/highway. Roads are categorized into different types (highway, major road, small alleys, etc.). The candidate can suggest that only major roads are considered by Maps for finding the shortest path between 2 points close to source and destination. Finally, to get to these major roads (near the source and the destination), all types of roads can be considered.

After understanding all this, the candidate should summarize the entire system that they designed.

CASE 3: HOW DO YOU TWEET?

Tweety bird turned from a yellow canary to a corporate icon

CASE STATEMENT

Design a social media application like Twitter

PRELIMINARY QUESTIONS

What is my application supposed to do?

We need to do the following:

- Allow users to create and maintain an account.
- Each account should be able to connect with other accounts they are interested in seeing, using a follow feature.
- Each person should be able to create and post short 140-character messages for everyone to view.
- There should be a search feature which allows people to find a particular tweet.

Should I look at app design as well?

Let's only look at the backend architecture and not concern ourselves with app design.

How many users are we looking at catering to?

Let's not worry about scale, for the purpose of this case.

CASE FLOW

Account Creation

Each user is given a unique ID which is linked to their profile details such as name, age, email ID, phone number, username, password, etc.

This account must be stored on the device/server and should be updated on the server when changed.

Connecting accounts

Each account is now identifiable by a unique ID. The next step is to link different IDs. This can be done by building a graph. A subtlety to note is A-B connection is not the same as B-A connection, as a person you follow may not be following you. With this, you should build a network for every user. Each user's account has a list of accounts it is linked to.

Tweeting

1. The candidate should infer that one would need an intermediary computer (a server) to store tweets, so that others can view this.
2. The tweet must be limited in size on input and rejected if greater than 140 characters.
3. Each user ID should be linked to her/his tweets.
4. Each tweet should have a privacy tag (Which defines visibility based on the connection network we have made).
5. Any user who fulfils the privacy requirement should be able to access the tweet.
6. A priority list must be made amongst the available tweets so that they show up in a list. This priority can be chronological or otherwise.

Searching for Tweets

1. The candidate must realize that searching all tweets for the search phrase is an inefficient process.
2. The candidate must come up with a search strategy. This can be done in different ways.

Note: For this method it is important to talk about how the data would be sorted in order to search through the database of tweets.

TECH TITBITS

Bite sized tech knowledge for all!

TITBIT 1- HOW THE INTERNET WORKS

What happens when you type in a website name on your browser? This titbit will focus on the process that happens behind the scenes, whenever you click on a website link.

Just like how every house in the world has an address, every computer has an address too. This address is called an IP address, and is generally a number (ex. 172.16.254.1). The IP address helps to uniquely identify every computer on the internet. Your Internet Service Provider (Jio, Vodafone etc.) assigns you your IP address.

When you click on a website, the information required to load that website is fetched from a server. Just like any other computer, servers have IP addresses too. How does your computer know which server to fetch the information from? That's where DNS comes in.

A DNS (Domain Name System) is like a huge phone book, it has a list of websites and the IP addresses of the servers where the website information is stored. When you enter a domain name (Eg. www.google.com) on your browser, your browser sends a request to the DNS server to find its corresponding IP address (The IP address of google.com is 172.217.163.110.). After it gets the IP address, the browser simply forwards the data request to the IP address of the server, which receives it and sends back the information. Information is transmitted in the form of packets, and often travels thousands of kilometres through underwater giant optical cables, before it reaches you!

Further Reading Topics: IPv4, IPv4 Address Exhaustion, IPv6, ISO Network Layers.

TITBIT 2 - PASSWORD PROTECTION AND HASHING

Have you ever wondered how companies store your password? What does encryption mean, and how do companies stop hackers from stealing your password? They use a process called hashing, which we will now examine.

A hash function can take any input (regardless of its length), and convert it into a fixed length text output. For example, if we use the SHA3 hash function, the output is 256 bits long, regardless of what we input.

Hash("mypassword")=42a00eaa9468b08adc80d9dfb877a6d30c3ed64eea29
3e94522869ee3de4f1e

The magical thing about these hash functions is the fact that they are one-way functions ie. It's easy to compute the output of a hash function given an input (there's a formula for it), but it is almost impossible to figure out what the input to the function was, if we have only the output. The output is completely different for very similar inputs as well! For example, if we change our input by just one character, we get:

Hash("myp@ssword")=89c8571ca21760aef65789105b49f7df90b9c05fb7d1
013b6e437d84c529175e

We see that the output for "mypassword" and "myp@ssword" are completely different! This is one of the reasons why it's almost impossible to find an inverse for the hash function. And it's this property that makes the function incredibly valuable.

Tech companies never store your password as it is. They always hash your password, and store the hashed version of it. Now, when you type in the password in your browser, the text you type in is immediately hashed, and then compared with the hash stored in the database. If the hashes match, that means you know the password! The ingenious thing about this is that even if the hackers hack into the database and steal all the data, they only have access

to the hashed versions of the passwords. And hence it's impossible to figure out the original password from the hash, they still don't know your password!

Of course, hackers can try to guess your password, create its hash, and compare it with the hashes they've stolen to see if they match. However, this process is incredibly computationally expensive, and would probably take them years to figure out! Hackers however generally have a pre-computed list of commonly used passwords and their hashes, and hence it's always recommended to use a password that isn't common (therefore if your password is "password" or "qwerty", go change it immediately!).

Further reading topics: Rainbow Tables, Salt, Pepper.

TITBIT 3 – COMPRESSION (LOSSLESS)

Zip folders are a common occurrence on our laptops. We use them to save space without losing information. How do we achieve that? What allows us to make a file occupy less space? Let's look at how this works!

To understand how this works, take this sentence from Roberto Bolano's book 2666:

I felt happy because I saw the others were happy and because I knew I
should feel happy, but I wasn't really happy.

This quote has 115 characters (including spaces, apostrophes, commas, and periods). As you may notice this sentence has a lot of "I's and "happy's. So what does compression do? It says hey let me replace happy by some special character, say '~' and let me have another file that lets my computer know that ~ is a place holder for happy. Currently if I assume one character as one unit of memory, then this sentence has 115 units of memory. Now replacing happy with ~ allows me to reduce the memory consumed by 4 characters for each happy. That's 16 units of memory. Now

I need another file which tells me ~ represents happy. So that would need say at least 6 characters ("~happy"). So totally I have saved $16 - 6 = 10$ units of memory. That's an 8% memory reduction!

Let's be a bit smarter though, maybe I shouldn't replace "happy" but instead " happy ". So now I'm actually saving 6 units for each happy. In my new calculation I save 16 ($24 - 8 = 16$) units of memory. That's a 14% memory reduction .

The crux of compression is to find patterns and map them to a dictionary. The challenge is finding the best patterns for a given file!

Note: This compression is called lossless compression as there is no loss in data. There are other types of compression for images (like the .jpeg format!) where you lose data but retain almost all the required features of the image.

Further Reading Topics: Lossless Image Compression (png), Lossy Image Compression (jpeg)

TITBIT 4 – SEARCHING FOR SOMETHING

Any searching and reporting engine follows 3 steps. (Note: A searching and reporting engine is not limited to Google or Bing. Facebook uses such engines to decide the order in which posts show up on your timeline. Swiggy uses an engine like this to choose the right restaurants to show you on the Swiggy home page. Almost every website/app which shows you information will use an engine like this.) The three steps are:

1. **Crawl:** Crawling is the act of looking through all the information available. This could be the set of all FB posts online, all websites on the internet (yes, Google and Bing regularly do this!), or all the restaurants with Swiggy. How one goes through this data set (mostly by dividing it and parallelizing) is unique to each organization. The

faster you can traverse this space, the better. Organizations do this activity periodically, in order to ensure they are up to date.

2. **Index:** While traversing through the information, each bit of this information needs to be indexed. For example, Google might do this by creating a set of keywords for every webpage it visits, so that the page can be identified. These keywords could be the various words appearing on the website, or in Swiggy's case, the type of cuisine the restaurant offers.
3. **Rank:** After indexing, the next stage is ranking. Ranking is the process of mapping each index to the relevance of your query. In a search engine, the query is what you'd type in, on Swiggy it could be your previous order behaviour. The rank is assigned based on a set of factors (for Google these could be credibility, match with the query, number of links to/from the website and so on.). After ranking, the preferred results are displayed.

And that's how search engines work, in a nutshell. Of course, incredibly powerful search engines like Google do a ton of other stuff as well, but these other things are all done with the intention of improving these 3 stages – crawling, indexing and ranking!

Further Reading Topics: PageRank, Search Engine Optimization.

TITBIT 5 – CLOUD STORAGE

We've all used apps like Google Drive and One Drive. We've also all heard the term 'cloud' being thrown around. What is cloud storage though? Why is it useful? Let's take a trip to the clouds, to find out.

Meet our good friend Jack. Jack just finished making a super important business document. His boss asked him to keep the document somewhere safe so that they could use it in the future. So Jack saved it on his laptop and his pendrive, and took a print out of it. Now, Jack was very paranoid, so he

locked the paper and pendrive in the company safe. When Jack was on his way home, his laptop got drenched in the Chennai rains and refused to switch on after that. Jack was happy that he had a pen drive left in the safe. He took the pendrive out of the safe the next day to make changes to the document. Jack wondered to himself, if there was an easier way to keep his documents secure and safe.

Then Jack found the cloud. The cloud and Jack's pendrive aren't very different entities. They operate on the same idea. It's a place that stores his documents/files/photos in a manner by which he can access them anytime and from anywhere as long as he is connected to the storage device. Generally, this is done using the internet. In some cases (generally corporate organizations) it can be done through intranet as well.

Anyone with Jack's pendrive has access to his files. Similarly, anyone with access to the file in the cloud can access the documents. Since everything is on the internet, file transfers can happen almost instantaneously.

Jack decided that he would give the pendrive to his friend, tell him to keep it safe, and give it back to him whenever he needs it. Then Jack's friend Bob would be responsible for making sure the documents are safe. To ensure this, he may create copies on his computer, another pendrive, etc. Bob is essentially guaranteeing two things: 1) The file access will only be with Jack and whoever Jack allows access to. 2) The file won't get lost or destroyed. These two tasks are what organizations like Google Drive and One Drive do. Of course, the real hard work here is figuring out a way to store files so as to minimise the amount of storage space used, while maintaining ease of access. All these companies have giant physical storage servers where the user's files are stored.

Further reading topics: IaaS, PaaS, SaaS.

TITBIT 6 – GOOGLE ADS AUCTION

To show your ad on Google seems like a smart idea. How does Google decide whether and where to show your ad? Let's take a look into the Google Ads auction system.

Have you noticed the ads which show up on top of the search page when you search for something on Google? A lot of companies are fighting for that top spot, to be the one that appears on the top of your sponsored search results. However, Google has a limit on the number of sponsored results it can show you, and hence can't accommodate all these companies' requests. Hence, every time Google has to show an ad for a user, it holds an automated auction to decide who wins the ad space!

Any advertiser first needs to identify the search keywords she/he wants to bid on. These keywords are the set of words or phrases for which they would like their ad displayed. After this, the advertiser sets the amount she/he would like to place as the bid amount for any keyword/key phrase. When a person makes a Google search, a list of all relevant advertisers is made. Each advertiser is entered with a limit of one keyword bid per advertiser. These advertisers are then ranked, to determine who shows up first. This ranking is decided based on two factors - the bid amount and the quality score. The quality score is a metric meant to establish the relevance and usefulness of your ad to the user. If the advertiser does both these things right, their ad can show up on Google! The important take away is that for a successful google ad, you need to be relevant and useful to your target customer, not just cough up the most cash!

Further reading topics: Google Ads Quality Score, Google AdSense, Google Display Network.

HR PREP: HOW TO MAKE GOOD CARI

Welcome to cooking class. Here, you shall not learn to cook good food, but to cook up good stories instead. The dish we shall prepare today is CARI.

“Tell me a time you’ve lead a team?”, “Give an example of when you resolved a conflict” are some common HR questions we prepare for before the fateful interview date. How do you get started with coming up with answers to these questions? What is the interviewer looking for in these questions? This section will cover a technique called CARI to help you come up with answers to these questions.

What is CARI? CARI stands for **C**ontext, **A**ction, **R**esult and **I**nference. It sounds like a lab report, but is an effective way to answer experience-based questions. The idea is that the interviewer should clearly be able to take away the following:

1. What did you do?
2. What happened because of the action you took?
3. What did this experience teach you?

Let us look at the 4 steps involved in making a good CARI:

CONTEXT:

Describe the situation for the interviewer. The purpose of this is to give the interviewer **relevant information** about the following:

- Stakeholders: The people who were impacted by/involved in the decisions you took.
- The situation you had to intervene in.

Eg: I was leading a 5-member team for my college’s cultural festival, we had to choose an artist to call for...

Keep your context as short as possible and leave out any details that do not add value to the overall story. (In the previous example, things like which team you were leading, the names of the team members, etc. may be irrelevant to the story and should not be included.)

ACTION

What did you do? Why did you do it? Explaining the factors that influenced your decision before you talk about the decision itself. This will help you build a more convincing story. (*Eg: I noticed morale was low ... hence took them out for ice cream vs I took them out for ice cream ... hence morale increased.*) Breakdown the action you took into small steps and keep them generic. *Eg: I first found an error in the code. Then I tried to debug it. Finally I found the error and fixed it is better than I searched and searched throughout the code. I realized the for loop had an increment of 2 and not 5 and hence I changed it.*

Make sure you focus on the thought process behind the action and not just the action itself.

RESULT

What did your action lead to? Explain the consequences of your action and its effect on the various stakeholders in this situation. (*Ex: By implementing I was able to achieve a user acquisition growth of And This allowed the client to gain and my team to get*)

INFERENCE

What insight did you gain from your actions? What did you learn that you had not known before? How did this incident make you wiser? (*Ex: I learnt that it is more important to have a committed team than a smart one...*). Having a good inference is essential to developing a good CARI. Your inference should be novel and showcase some understanding, realization or growth.

SECTION 3: INTERVIEWS WITH PRODUCT MANAGERS

INTRODUCTION

As mentioned in the preface, Product Management is a fairly new role. The best way to get an idea of what this role is about is by actually talking to people who have worked as PMs. The idea was to answer 3 basic questions: 1) What does a PM do? 2) How does one get into PM? 3) What after PM?

The role's requirements and responsibilities are rather diverse, and depend on the product that's being managed. These interviews are meant to help you understand this role better. It's meant to provide you with the ability to decide if product management is your cup of tea.

These interviews are the experiences of particular individuals. The things mentioned here are not exhaustive of all the PM opportunities and PM experiences. They are meant to act as a base for you to use. After reading this, we advise you to get in touch with other PMs and talk to them in order to understand the role better.

We recommend that you check out some good PM blogs (for example, “What, exactly, is a Product Manager?” by Martin Eriksson on the “Mind the Product” blog), before you read these interviews. This will help to establish some basic understanding about the role.

For those of you who may not have time, we've also included a brief summary of the interview, before every interview. However, we highly recommend that you read every interview in entirety, in order to truly understand what the role is like.

INTERVIEW 1: ARINDAM MUKHERJEE

SHORT BIO

Arindam is the Senior Director of Product for the User Experience and Growth team at Flipkart. An alumnus of IIT Kharagpur, he started his career at P&G India, where he spent a year before quitting to start his own company, Greenhat Ventures, in the online education space. He went on to do his MBA at Harvard Business School, after which he spent some time working as a PM in various places, before coming back to India and joining Flipkart.

BRIEF SUMMARY

How did you get into Product Management?

- Co-founded a startup and got a flavour for Product Management.
- Mentor guided him into applying for a PM role at Trip Advisor.
- Joined Flipkart. Never looked back.

What is the role like?

- No two days are the same.
- Looks into data, does competitor research, gets insights to figure out the right problem to solve next and to figures out how to go about solving it.
- Stakeholder management, trying to influence people, pitch solutions and upskill.

Key learnings from it

- Wears multiple hats, tackling every day as it comes.
- Problem Solving, Communication, Empathy, Technology appreciation and understanding.

Opportunities after product management

- Remaining in Product roles.
- General Management.
- Venture Capitalist roles.

FULL INTERVIEW

Advaith: *How did you get into Product Management? What does your path to it look like?*

Arindam: My foray into PM happened pretty much in an unstructured manner, where I did not know that I was actually doing the work of a Product Manager. After graduation and my first job, I decided to start up on my own. We got into the online educational services domain and I was wearing multiple hats there – being able to define the customer, figuring out the problem the customer was facing and finally, figuring out (along with my fellow co-founders) how to solve that problem. And then of course we had to figure out a business model through which we could make money. So that was my first foray into it - I didn't know it was called product management back then – back in 2008 Product Management was not a very well-known role. Then I went and did my MBA, and that's when I started hearing bits and pieces about PM again – I wasn't too deep into it though – I was more interested in marketing at that time. I joined a company in the healthcare industry where I was again trying to solve a particular problem, this time for hospitals. We were using RFID readers and tags to try and build an application suite of products to reduce shrinkage of medical instruments in hospitals.

So yeah, did that and at that time I had no idea that this was the flavour of Product Management. In parallel I was in touch with this mentor of mine who was heading product at Trip Advisor. Post this stint I was talking to him and he said “Hey, what you’re doing seems to be very close to product management, which is what we do, so why don’t you give it PM a shot at

Trip Advisor?”. And they gave me an exercise to work on - choose any product you like, figure out 3 problems with it and tell us how you would solve them. I had a LOT of fun doing that exercise and I got selected and joined Trip Advisor! That was my foray into structured PM. Trip Advisor was a company that moved very fast. I did a lot of experimentation and data analytics as well as looked at design. It gave me a good exposure of how PM is generally practiced in large organisations. Post Trip Advisor I joined Flipkart, which has again been like a rocket-ship. However, here it's more about taking my existing skill sets and rallying people around the product vision and strategic outlook. That's pretty much been what I've done here at Flipkart, over the last few years. So yeah, that's been the evolution of my career - starting off with figuring out how to solve a problem, to now figuring out what problems to solve for!

Advaith: You said you started your journey into product management by starting up. How similar would you say a PM role is to the job of a co-founder in a startup?

Arindam: It depends on whether you're working as a PM in a startup environment or if you're working in a mature organisation. Product folks will be wearing different hats in these environments. This is because in a smaller setup you'll be more agile and less process driven - the focus there is to learn fast and fail fast. You're trying to figure out whether you have a good product market fit.

In a mature organisation there are a lot of processes in place. You're operating at a scale at which you cannot break things. Hence you need to keep in mind a lot of the non-functional elements as well. You're thinking about building products at scale. And sometimes also taking over products that have reached a certain level of maturity.

So these are some of the differences. When I started up, I was wearing multiple hats. I'm wearing multiple hats now as well, but now there are a lot

of things I need to be wary of. The common pieces are that you're still prioritising and making decisions in both setups. Product Management, because of the fact that it's about problem solving at its very core, involves a lot of decision making. Decision making is a skill that PMs have to master as they grow over the years, and this really helps while starting up.

Advaith: Alright, so are you saying that the skills you pick up as a PM would be useful while starting up?

Arindam: Yeah absolutely. We've seen that trend in the broader tech ecosystem. A lot of Flipsters (Flipkart employees) have gone ahead and started up on their own as well, after having worked at the product function at Flipkart. Look at a founder or an entrepreneur. What are they doing? They're trying to figure out what the problem is and trying to find a differentiating way to solve that problem. It's this process that will earn them revenue. They will also pitch to multiple VCs or investors to raise capital – that's where they're in selling mode. The core skill sets are problem solving, communication and selling.

As a Product Manager you're doing all of that and - if you're a good PM - a lot of these skill sets come very naturally to you. Obviously, becoming a founder has a lot of other elements also involved - for example you have to be pretty savvy in figuring out your financials as well, where PM is not going to give you much exposure. But having said that, I do believe they're highly similar, as they're all about problem solving, and I think that's the core skillset required.

Advaith: Getting back to your story before Product Management, you worked at an FMCG, then started up and then did an MBA. Did those experiences help you in your role as a PM?

Arindam: Yeah absolutely. I joined P&G after graduating from IIT KGP, and my first responsibility was to set up and own the entire production line

for the first baby care diaper producing factory in India. It was a huge responsibility at an FMCG like P&G, and I got to do it as my first job! It exposed me to quite a few things:

First is that when you're building a product - consumer research is super important. You need to understand if you are building a product that satisfies the need of the consumer. Our product tanked in the market, *laughs* even though it was a low-cost variant of a diaper. A very small nuance that we missed was that when parents buy diapers for their kids, they're looking for a diaper which not only keeps their babies clean, but also keeps them warm. Our diapers were great in terms of their absorbing capacity, but they were also very thin! Hence people felt that they were not going to keep their baby warm. So even though it was cheaper and the absorbing power was exactly the same, people didn't buy it! These things get uncovered only by doing deeper research, and this taught me the value of doing it before building a product and taking it to market.

Secondly, I learnt the importance of building relationships with people. I was managing the production line and had a lot of technicians reporting to me. These technicians were of different age groups - some were as old as me while others were in their early forties. It was important for me to relate to each one of them. That lead to me eventually coming out of my comfort zone and forging relationships with them. The moment you realise that someone else's career depends on you and the guidance you give that person, a sense of empathy automatically sets in. And this was a big learning for me.

The third thing I realised was that technology has such a big role to play in the products we use everyday. That machine churned out around 500 pads every second and was a thrill to watch. It also kept me awake at night, because the reliability of the machine was super critical. When you're operating at such fast speeds, you have to stop the machine the moment you realise something's gone wrong. But colossal damage has already been done by

then, because of the pace of the machine! I learnt that technology can make things better if operated in the right way, but if things go slightly wrong, it can result in a whole lot of blunders.

So yeah those were my learnings, and I still do carry these learnings as a product guy. I'm lead user research and use it to understand the problem deeply before I try to solve it. As I'm leading people now, it's important to have that sense of empathy and build relations with the folks I work with. The third part about figuring out technology is more important now as I tend to tinker with technology a lot more.

***Advaith:** Abb okay, that's really interesting. You've talked a lot about the bigger picture of product management. Now, tell me what your average day is like.*

Arindam: I think the best thing about the role is that no two days are the same. That's been a constant throughout my product career, though I've been in PM for more than 7 years. As product guys, we spend time doing primarily 5 different things. We're either understanding data, doing competitive research or getting insights to figure out what the right problem to find and solve is. The second bucket which takes up a lot of time is stakeholder management, wherein you're trying to influence and sell to people. You will be trying to pitch a particular solution to engineering teams, design teams, leadership teams or just about anyone else. The third bucket which takes up time are the execution pieces, where you're working with engineering and design to ship features out, while ensuring that they go out in a quality manner and on time. The fourth thing which takes up time as people go up the ladder is in coaching people under you, the people that report to you. The 5th thing that takes up time is your own learning. It's important to keep upskilling yourself, whether it's in soft skills or tech skills. These 5 things will have a different weightage for you depending on the stage your career is in. The initial stage of your career will be execution heavy and will have a smaller focus on people management. I spend more time on strategic thinking and

people management. What should remain constant is the learning. At least 10% of my time goes there. How I spend the rest of my day honestly depends on the day! On some days, I wake up to mails saying that something is broken and I spend the rest of the day trying to fix it. A lot of time goes into this sort of firefighting. On calmer days I can sit and think about new things that we can do.

Advaith: You must have seen a lot of PMs over the past few years. What do you PMs do after they step out of product management?

Arindam: If you look at junior PMs, I've seen most of them stay in product, as there's so much to be done. There's a sense of thrill and excitement that comes from solving problems in technology. Some of them go to upskill themselves. A couple go for an MBA as well, but that's a declining trend. You don't need an MBA to get into PM these days, as you are get exposed to a lot of business functions on the job. There are primarily 3 tracks I've seen. 1) People remain in Product and get into something like Chief Product Officer roles. 2) Some folks switch to general management and business roles. 3) Venture Capital roles as some people believe that they can add value there. These are the three paths I have seen. Having said that however, it's still a very nascent function, and has been around for only fifteen years or so ... it's still in its early days.

Advaith: What are a few skills aspiring PMs should have?

Arindam: Problem Solving, Communication, really good Relationship Building and Empathy and finally having a bend towards technology and its use to push boundaries. These are major ones. A bonus would be product marketing skills. Building a product is one thing, but evangelising that product is really important, but generally overlooked.

Advaith: You started the Associate Product Manager (APM) programme at Flipkart. Why did you start it?

Arindam: We started the APM program four years ago. I had just relocated from the US then. One of the visible things I noticed in the Indian ecosystem was a dearth of product managers. We hence decided to start grooming product managers ourselves. That sounds great, but at the time we had no idea as to where we would get these people from! So we asked ourselves, “What’s is the core skill we’re looking for?”. The answer was that we were looking for the ability to solve problems and have a learning mindset. And what better place to find people with these skills than the top institutes of the country! That’s why we started going to the IITs and BITs for the APM program. We wanted to structure it in a way that the cohort selected (by a rigorous process), would form a sort of “elite group”. We were clear that we want these people to raise the bar within Flipkart too. Once they come in, it’s our responsibility to groom them. This is why we have the two-year rotational structure.

Advaith: *Flipkart usually only hires people who have an MBA, as well as some work experience, for the Product Manager role. How do APMs cope, given that they don't have this sort of background?*

Arindam: At an MBA program, you are taught how an organization functions. There are different functions within an organization which help it run, for example finance, marketing, operations, strategy,...

Think of an MBA as a compressed time period in which you understand how a business organization works. Product Management is a cross functional role that requires you to interface with multiple people from different functions. By the very nature of the role, an APM does and learns a lot about how businesses operate. An MBA definitely adds value. But in today's world where technology is continuously changing, I find that academia has kind of lagged behind. This is where the B Schools may need to up their game to stay relevant.

Advaith: What is your advice to people sitting for product management roles?

Arindam: You are in some of India's top institutions and you would have solved tough problems. Now, it's time for you to hone that problem-solving ability. This comes naturally to some people, while others may need to spend some time practising it. We're looking for the ability to break down large problems into smaller, solvable subsets. Of course, this can be honed over time. There are a lot of good courses you can take to introduce yourself to product management - where you learn how to define target audience, size an opportunity, break down a problem, etc. As long as you are excited about solving problems, product management can be learnt. Be curious, keep learning and keep reading!

Advaith: What are some things that you dislike about the role

Arindam: Regardless of what you do as a PM, there will be some users who will not like your product. This is especially applicable if you work on products with millions of users. It's really disappointing, but it's also what eggs you on. It's also a reminder that you need to keep improving!

INTERVIEW 2: PADMINI JANAKI

SHORT BIO

Padmini Janaki is a PM with 8+ years of experience. She has worked at PayPal, Cognizant and is now at Change Healthcare. She's found her passion in product management and is invested in improving User Experience. She is currently the chapter lead of the organization Women in Product, which helps enable the professional development of female product managers.

(P.S She was RJ Padmini for some time.)

BRIEF SUMMARY

How did you get into Product Management?

- Started career as a UX designer, worked way up the ladder into product management.

What is the role like?

- It's a simple role, but not an easy one.
- Understanding the product, its complexity, dependencies and intricacies.
- Meetings, discussions with various individuals including engineers.

Key learnings from it

- Technological understanding.
- How to handle and negotiate with people.

Opportunities after product management

- Pretty much everything is open.
- Most people want to get into PM.
- Up the ladder to CEO.
- Go-to-market roles.

- Product marketing management.

FULL INTERVIEW

Akash: *So how did you get into Product Management?*

Padmini: I started my career after college as a visual designer. I was into UX, usability and researching users, ie. how the customer is buying. I worked for PayPal, which is a customer obsessed company. We had to look at how people made a payment and their motive and mindset while making it. It was a little fantasy-like for me, and was really exciting. However, the changes I brought to the product or feature weren't always implemented, because there was one PM who would decide if it was required or not. And that pissed me off.

Laughter

So I said to myself, “I’m going to be a product manager.”. It wasn’t easy for me to transition as my core strength was never technology. I didn’t understand the back-end side of things or how tech systems worked. There’s this famous story about four blind men who go to see an elephant, and everyone touches a different part (the trunk, the legs, etc.) of the elephant and thinks that that must be what an elephant is actually like. But as a product manager, you need to understand the whole elephant. You need to understand the product as a system. I always thought it was a business guy who got to make decisions. When I went through courses and prepared for the role, I learned to appreciate the entire system. As a PM I was able to answer the question “Why?”, whenever business chose a particular course of action.

Akash: *I’ve read your articles on LinkedIn. I don’t remember them all that well...*

Padmini: Neither do I.

Laughter

Akash: In one of those articles, you had spoken about an iterative process for finding your passion. How would a college student do that? Should they do it at all?

Padmini: I think it's important to keep trying. I don't think you should stop aspiring to take up another role. You need to try - you may fail - but keep trying. You'll learn a lot from the experience of interviewing for various companies or startups.

Hot chocolate arrives. General mood of the interview improves significantly.

Padmini: It's not important to just run. To be successful, I believe you have to test, run, fail and keep iterating.

Akash: What is the PM role like in various firms?

Padmini: You could be running the entire company – that could be the product! My husband worked with Swiggy when it was small, and there was one PM running the whole product. Now there is a PM for every button in the app! The challenge there is that even if you own just a single button, you need to understand how it influences the entire product and try to achieve the Business goal. It's commonly said that a Product Manager is a mini CEO. You need to function as if you were the CEO of that button. You need to own the whole button and manage its impact on other aspects of the product.

Akash: To summarize, is it about owning the subsection you are assigned to?

Padmini: It's not that you need to understand the full product and own the particular subsystem. You need to understand the domino effects of the decisions you make. You need to understand the bigger picture and focus on the smaller picture.

Akash: What skills did you develop for the role, learn during the role and use for the role?

Padmini: Product Management is a skill that takes a lifetime to master, you'll learn something every day. Let's say you are a college student who has never been a PM. You decide to build an app. In order to do this, you need to first understand how to identify use cases. When you need to get something done you go talk to people, and you need to understand what they need and how to talk to them. I don't think it's a role you can master by sitting and studying a particular course. It's a lot about "learning" people.

Please drink your hot chocolate.

Drinks hot chocolate

Akash: We all have concerns about the infamous "Steep learning curve." Is it applicable in PM? What do you learn in the role?

Padmini: I believe you need to work in an engineering/design role before becoming a PM. This way you'll do actual work before you become a manager.

Laughter

Padmini: It's fine not to, but it helps you understand how things work at the ground level. As a PM, you'll have to sit with the engineer/designer, work with them and learn from them.

Akash: Is it fair to say that you don't learn as much as the engineer? But there is pseudo learning that does take place?

Padmini: It's like joining the school in 4th Grade. You don't need to be capable of writing a 1st-grade exam, but you should know what the curriculum was in 1st grade. The setting is very different in a corporate coding environment. In fact, you'll observe a stark gap in knowledge between the

coder and the PM. The coder may be the expert, but you, with no experience, need to explain the business need to the coder. All he cares about is his code and what it does. You need to figure out what he needs to do and how to get the task done.

Akash: *What do you like and dislike about the PM role?*

Padmini: It gives you fulfilment. Let me give you an example. We had very high call volumes at our BPO call centres. People face problems and hence call the BPOs. This call volume was increasing. This was bizarre, as the online interface was an easier way of registering a complaint. We were spending \$4/call for a \$3 product. So I rang up a customer who had called us 18-19 times. It turned out she didn't have a desktop and couldn't register a complaint on her phone. At that point, we had not focused on the mobile website yet. Hence, the portal did not work for the mobile website. After fixing this, the call volume reduced drastically. It was very fulfilling to see this result.

Dislike: If this hadn't shown results, and if say call volume had gone up you instead, then you are to blame as you made the decision and wasted everybody's time. When you win, it's a team victory, but when you lose it's your fault!

Akash: *Can you describe your average day at work?*

Padmini: I talk to a lot of people. Business people, engineers, etc. I talk to them and then create a requirements sheet. I try to get them invested in the product. I plan out the 1-year product vision, in which I figure out how much the product needs to be changed. My nights go away due to calls as well. No dinner for PMs!

Akash: *They aren't too many PM roles in India, so a lot of people apply for other Business Analyst roles. What is the difference between the two?*

Padmini: A Business Analyst role generally involves putting together insights by looking at the data and making a business decision. Let me take the example of the Amazon Fire Phone to illustrate this better. It failed as a product. They had all the data and did the analysis. They were looking at the customer data and customer demands and decided to go ahead.

Similarly, Yahoo! acquired Tumblr, thinking they would get users. That didn't happen. A PM needs to marry the data with emotional intelligence to design good products. That is what makes a good PM.

Padmini: You should check out these books - 'Start with Why' and 'Find Your Why' by Simon Sinek, and 'Mindset' by Carlos Dweck.

Akash: *What can you do after PM?*

Padmini: There are a lot of avenues. PM to CEO is a very possible and natural growth. It's a good stepping stone. Most people want to move to PM, the other way around isn't so frequent. If you want to move, a go-to-market role exists that people can transition to, otherwise product marketing management. This is about marketing the product to the right users. Or perhaps roles that involve positioning in the market. Marketing and Sales as well. Actually, any role could work!

Akash: *There are people I know who may want to move into finance and trading as well. Is this possible?*

Padmini: You don't need to be a PM to do this. Like the standard south Indian rule, do engineering then decide what you want to do. PM to finance could be a trajectory, especially in finance companies, but I don't know any person who has.

Akash: *Can you do higher studies after PM? MS/MBA*

Padmini: Nothing is stopping you! It's up to you at the end of the day! Things are pretty flexible in today's market.

Akash: Could you perhaps give a summary of what you think the role of PM is?

Padmini: It's a simple but hard role. It's exciting and changes from day to day. That's how I would say the role of PM is.

Akash: That's all I wanted to know! Thanks a lot for your time!

INTERVIEW 3: SOUMYA PATRO

SHORT BIO

Soumya Patro is a Product Manager at Jane.ai, which is a start-up that builds conversational AI for enterprises. She completed her Bachelors in Technology in Electrical Engineering at IIT Guwahati, after which she worked at VISA for a while as a software engineer. Post this, she went on to pursue her Masters in Management Science and Engineering from Stanford university, before joining Jane.ai in her current role.

BRIEF SUMMARY

How did you get into Product Management?

- Networking, networking, networking.
- Went to events and sessions and met people and actively searched for such opportunities.
- Software engineer, to management degree to PM.

What is the role like?

- Very diverse, very interesting.
- Boss of the product, not the engineer or designer.
- Meetings, product roadmapping, and working with engineers and designers.
- Coordinate and drive the product forward step by step everyday.

Key learnings from it

- Strategy – Understanding, planning.
- Day to Day execution.
- Design thinking, wireframe making.
- People management.

Opportunities after product management

- It's a role people generally exit into, not exit from.
- Data Science.
- Starting up.
- Business Analytics.
- Venture Capitalism.

FULL INTERVIEW

Advaith: How does one get into product management?

Soumya: The number 1 way to get into product management is networking. There are very few structured programs, both in India and the US. APM programs are very few and very competitive, and they give you a basic view of what product management is. But all companies have PM roles. So, if you know the right person who's looking for a PM, and you have certain skillsets that they need, that's a big plus. There are always these hidden PM roles that you would never know about unless you talk to people and tell them that you're interested in PM.

Advaith: Oh okay. That's interesting, because a lot of the people reading this may feel like they do not have access to some sort of network. So how do you think they could get into something like this?

Soumya: It's a misconception that if you're a student, you can't have a network. Specially because you have so many alumni in a lot of companies. You don't get access to a network; you have to make your network. Cold email people, message them on LinkedIn. Tell them you're interested in product management, forward your resume to them, ask them what you need to do. Ask them what you need to do in your junior (pre-final) year, if you want to be a PM by the end of college. The earlier you start building a network, the better it is for you.

Akash: All of us have a fear of reaching out to people in companies. So, could we just mail a higher up person in a company and say “Hey, do you have PM roles?”

Soumya: Reach out to recent grads. They’ll give you some pointers on what to do. You don’t have to reach out to someone who’s say, a Vice President in PM. The other way to get a PM role is the non-networking way, which is the placements stuff. And there you need to do everything apart from networking really well, which is often harder to crack.

Akash: Could you tell us a bit more about how you got into the PM role?

Soumya: I was a software engineer for 2 years. I knew about product management at the time because I was working with PMs. I didn’t see myself in software engineering as a long-term career, and PM seemed interesting to me. So that’s how I got interested in product management. How I got into this specific role is through networking. I used to go to Women in Product events (these are held in India too) and I met and reached out to a bunch of people. Someone had posted about the role on Facebook, at a Women in Product page, and that’s how I got to know about the role.

There are a lot of people who want to get into the PM role. Like me, a lot of software engineers want to get into this role. Similarly, consultants and others from a business background want to get into it as well. So many people want to get into PM at different levels in their career. Hence, you need to broaden your search area to get into it.

Advaith: You said you found the PM job more interesting when you worked as a software engineer. What was it about the job that appealed to you?

Soumya: I used to be on the implementing side of product ideas and product strategies, but I was usually not involved in discussions on where the product was headed, what should be built and the effect it has on the company. So, I would always be like “Oh somebody told me to do this because it would

achieve certain things”, but I would never be the one deciding why it should be done. So, I think that was the motivating factor – the fact that I wanted to be more involved in the process.

Advaith: *Ahh okay. So, tell us more about your current role at Jane.ai. What do you do as a PM?*

Soumya: Cool. So Jane.ai is a conversational AI platform. One part of it is a chatbot, and the other part is data mining and search. With Jane.ai, you can search for all the information you have within your company. Think of it as an internal Google; you can find things like people who are good at something, documents, policies, basically anything that exists within a company. I’m working on building a developer platform on top of jane.ai, so that a user can build their own apps (like inventory search, matching sellers etc.) on top of Jane.ai.

As for what I actually do is that I handle the product. For example, I plan the various stages of the developer platform, what version 1 look like, and how long would it take to build. I basically build a roadmap for the big product release at the end of every year. I need to break down that one year into small pieces, so that I can effectively plan it. This road mapping is an essential part of product strategy, which is a big part of my role. Another big part of my role is that I also design the system. Since I work for a start-up, I do a lot of wireframing and mock-ups myself. We do have designers as well, but they do the final design, while I do more of the wireframing (like choosing features, figuring out where to place them etc.). Then I work with engineers to get those products built. It’s always a trade-off and I have to convince them to work on my product rather than others. It’s a lot of negotiation, where I say “Ok, push this part of the product to the next phase”.

Advaith: *Just to be clear, you aren't the boss of the engineers, right?*

Soumya: No no. No PM is a boss of any engineer, in any company. A PM is essentially at everyone's mercy. *laughs*

Advaith: So you have to be really diplomatic in order to get your product built?

Soumya: For sure. There's a lot of negotiation, not just with engineers, but also with other PMs. I negotiate with them and say "Okay let me finish the version 1 of my product, and then you guys can go ahead and do version 2 of your product". It's a give and take, so that all the products move forward a little bit, instead of one product making it to the end, while the others are left behind.

Advaith: Are you the boss of anyone who you interact with? Or is it always a negotiation with anyone on the table.

Soumya: I'm the boss of the product. I tell the product "You should do this!". *laughs*

Akash: There's one thing that people sitting for placements generally ask, which is "What are the skills I need to develop to get the role?". Or to put it another way, what are the skills you use as a PM?

Soumya: There are many different kinds of products. If it's, say, a consumer product that everyone uses and understands, the skills required to build that product will be very different from that required if you're working on a healthcare product, which might need knowledge of healthcare things. So one thing to keep in mind is that it's a PM needs a wide range of skills, but some of the basic skills that all PMs will need might be a computer science understanding. An understanding of how tech works, how systems work, and how you can leverage technology to solve human problems. So, having a basic knowledge of basic computer science/software engineering is always valuable.

Soumya: You don't need to have it when you start as a PM, but you definitely have to learn it on the way, to be successful as a PM.

Akash: Along those lines, a lot of people I know haven't taken computer science as their undergraduate degree, and they fear that they can't take up a PM role, simply because they haven't learnt computer science in college. Would they be able to fit in as PMs as well?

Soumya: You can learn anything as long as you want to learn it. You can learn it if you want to.

*Akash: You had mentioned earlier that you do a bit of wireframing. I have a general concern, brought about my people like me who have absolutely no sense of good design. *nervous laugh* Is having the ability to design aesthetically a good skill to learn/use?*

Soumya: Thinking about design is very important. The software engineer I worked with did some very crappy wireframes. You need to learn how to design good systems. There's a really good book called the Design of Everyday Things by Donald A. Norman, which gives you a basic sense of the things you have to keep in mind while designing things. There are a lot of technical terms, but it gives you a sense of how important design is. All the products you use today, you're able to use because someone really thought about the design of the system, and a PM has to keep them in mind. It's not a pre-requisite, but if you're really interested in product management, you should think about good design.

And of course, basic communication and a little bit of strategy helps. Again, it's not a pre-requisite, just something you should keep in mind.

Advaith: What do you mean by a bit of strategy?

Soumya: There are different kinds of product strategies. There's an amazing blog called stratechery.com by Ben Thompson. It's a great blog to understand strategy, for example - Why did Flipkart acquire Myntra? etc etc.

Akash: It seems like the PM role is a jack of all trades. Would you call that a good description of what the job's like?

Soumya: That is true *smiles*. You're the one starting everything, but you're not the one finishing everything. You do conduct everything on the way, you're just not the one doing it though.

Advaith: Here's another thing we'd like to hear – What do you NOT like about product management?

Soumya: There are different stages of product management, depending on where your product is at. Since I'm at a startup, my PM role is very exciting, as I get to own the entire product and not just one small feature of it. So that's makes PM very exciting for me right now. But yeah I can see why it might get frustrating for someone else, who owns only one small portion of a product. It also depends on which phase the product is at; for example I get to design the product completely now, which is very different from working with a mature product, where you just have to maintain the features and add small changes.

Advaith: You did an MS&E degree at Stanford. Could you tell us a little more about that, and whether it helped you become a PM?

Soumya: I was applying for a lot of computer science programs, when I realised that I didn't want to do computer science in the long term. So I started looking around for other kinds of profiles, with a focus on those which were a mix of tech and business. And that's how I found this program! It has a track in it called Technology and Engagement management. The program itself has a wide variety of tracks – data science, engineering management, entrepreneurship, finance and operations. Basically all kinds of business fields, but combined with data science or tech. It's a great place to meet people coming from different backgrounds, and people switch between verticals all the time.

Akash: Do you think the degree helped you switch to the PM role?

Soumya: Yeah definitely. When I came to Stanford, I was still a very techie person who had no idea about business. Just being in this environment, taking classes that are not computer science, meeting all these people who were from different backgrounds, working with them – I think this gave me a lot of product perspective. It was a different kind of network too. I would say it helped me a lot, yeah, specially the different sort of courses that I took.

Akash: For someone else who is from a tech background – say working in software engineering, would you recommend doing something like this to get into the PM role?

Soumya: Umm, so this is not the only way to get into a PM role, and signing up for this program definitely does not guarantee you a PM role. A lot of people come into this program – I think there was a guy from IIT Madras who did mechanical engineering, went to ITC, came to this program, wanted to be a product manager. But he wasn't lucky enough to get into product management, so instead went into machine learning – he's an engineer at Walmart now. And it's interesting, because he can switch into product management later in his career, like within 2 years he can switch internally at Walmart, it's not hard, but yeah this does not guarantee you a PM role. You must have other career alternatives figured out. Also, MBAs go into product management and a lot of people come into these programs with PM experience already or do other things like ML and Data Science. So yeah, it's a wide mixture, there's no one kind of person who get into these and people do all sorts of things after it.

Advaith: And for people who apply for a completely research based MS or even a PhD (for those who want to be more extreme), or for people who do an MBA, do they shift into PM as well?

Soumya: Umm, yes. Anybody can get into a PM role. As long as you can tick off the 3 necessities, which are that you know a bit of computer science,

business and design. There are no cut-offs based on your education. But the kinds of companies that will hire you, and the kind of roles you'll get hired for will be very different. For example, a lot of Microsoft Product Managers come from Computer Science masters, because their products themselves (such as Azure) are so technical. But for products like Microsoft Word and Outlook, they hire a lot of MBAs as well, because you need to understand what features should go into the product. Similarly, understanding ads requires a lot of business sense. So if Google's searching for a PM for Google Ads, it might pick an MBA graduate. It's a wide spectrum. Based on what your interests are, you can do any sort of degree. Of course, an MBA is better if you already have some sort of computer science background. If you don't have any sort of computer science background though, it gets a little more dicey.

Advaith: *Ahh that makes sense. The reason we asked you this is because people (including the 2 of us) are perennially confused about what we want to do in life, and hence are always looking to see that they don't close certain doors by accident *everyone laughs**

Akash: *The next thing we want to ask you about is something we think most people face. Like Advaith said, most people are worried about the fact that what they thought they wanted to get into might turn out to be something they hate doing in the long term. Because of that, there's this word thrown around called "exit options", which are basically the jobs one can join easily, after product management. So if you were to leave PM tomorrow and do something else, what could you possibly do?*

Soumya: Hmm, so actually PM is one of those jobs people exit into, not exit from. People rarely exit from product management, simply because it's an exciting role and it's not as hectic as consulting or finance. But I can also see why people might not like it – maybe it's not their cup of tea. People can exit into data science, or software engineering, but I don't see many people going there. People can go into business analytics, you can start your own company. I've also seen some senior product managers going into Venture Capital. You

honestly just decide what you go into depending on what you want to do at that level. The answer basically is “it depends”, and a lot of career options are still open.

Advaith: *That's interesting. There's this notion amongst some people that PM is the “startup role”, because it gives you a flavour of everything and you get to own your products. Is that accurate?*

Soumya: That's true. That's true because, well ... that's not entirely true. There is a lot of overlap between being a startup founder and being a product manager. You're still taking on all that responsibility and shipping products, but on a smaller scale and with less control. As a PM, you're mostly just focussing on the product, and not on things like sales or marketing. You do some level of marketing, but not too much of it. Actually, vice versa works really well. Say you started a small company, built a product and launched it - even if it's just in your college – that itself is a great way to product management, because it's gives you this holistic view of what your product should behave like, what it should look like, how to you market it to your customers and how to sell it to people. So that way, being a startup founder is a great way into a PM role - probably the best way.

Advaith: *And if you're the type of person who says “well I want to work for a while and then start my own company”, then would PM be one of the better roles to get into, or is it not that great a fit?*

Soumya: I would say it's a great place to start. I wouldn't say it's better than software engineering though, because if you're a software engineer, you can very easily be the cofounder and CTO of your product, whereas if you're the product person you could be the CEO of the company, but you would still be dependent on others to build it for you. Consulting would again probably be the CEO, but it's more dicey, as you have certain strengths, for example sales, but you wouldn't know what's going on in the engineering side. I don't

think product management gives you an edge, but it gives you a more real life experience of what being a founder is like on a day-to-day basis, ie. to run a product and be responsible for it. As a software engineer you wouldn't feel this because you have very little responsibility - you have some tickets assigned to you and you just need to finish those tickets and you can leave. You don't have to think about the larger picture.

Akash: Tell us more about what your average day is like.

Soumya: Ahh that's an interesting question. I love looking at "A day in the life of" videos myself. What I'm about to say is pretty specific to my startup. We work on design sprints. The product and the design teams sit together, and I bring up tickets in the design sprint. For example - "Let's design the app store in this sprint.". Design carries a lot of weight because it's not just about how it looks, but also other things like "What should be our strategy for this product?", "What features should be there in version 1?", "Who's our intended customer?", "What are their objectives behind using this product?" or "What does success for this product mean?". Defining all of these things is a part of design. I take a look at all the things that I would have to do in that sprint, if it's the start of the sprint. I then pick one of these tickets and I start writing these things down (goals, features, solutioning etc) – it's a lot of writing, I have to tell you that! *laughs* I need to think a lot and do a lot of research in order to be able to write these well – research the competitors, the customers etc. All of this goes into 1 big document, and then if I have a wireframe in mind, I'll talk to the designers about how we can go about designing it. Once that's ready, I talk to the engineers. All of these are meetings by the way, design planning meetings, engineering planning meetings and a lot of other meetings! If one of these teams say that what I've proposed is impossible to make, then I have to go back and change what I had defined initially, so that it can work in their sprint cycles.

TL;DR: A lot of coordination and a lot of “driving the product forward” – step by step, everyday. I write the documents, I work with the designers to design it and work with the engineers to build it.

Advaith: *So the vibe we're getting is that being a product manager is all about meetings.*
laughs

Soumya: Umm yes. A lot of these meetings are about managing people rather than actually moving the product forward. It's a lot of getting people on the same page - “Do the designers understand the goal of the product properly?”, “Do the engineers know how to implements this?”, “What other things in the current system have to change to be able to accommodate this?”. A lot of work goes into aligning everybody. It sounds easy, it sounds like everyone should be aligned all the time, but no, 2-3 weeks into the product, somebody might say “Oh, I thought this is how it should work!” and someone else will say “No it should work this way!”, and I'm like “No no no! This is how the product should actually function!”. **laugh**

Akash: *Just to give us an idea of scale, how many people do you work with?*

Soumya: The startup has 60 people and on a day-to day basis, I probably work with 6-7 people – somebody from frontend, somebody from backend, somebody from product etc.

Advaith: *Oh that's nice. So would you have worked with all these 60 people by now?*

Soumya: Oh no! Half of these 60 people are marketing, sales and finance. I don't think I've worked with that half of the startup. Also a lot of the work is with the engineering leads, I don't work directly with the engineers because they're always working on something. It's mostly with the team leads or the engineering managers. I tell them something and then they figure it out amongst their own teams.

Advaith: *Ahh that makes sense. Uhh Akash?*

Akash: Yeah it does. That's all the questions I had at my end. Thank you so much for your time!

Note: If this interview inspires you to start networking, fill in this form - <http://tiny.cc/a6zebz> (Same as the one in the Preface.). We'll occasionally send you information about various PM jobs you can apply to, some more case prep material and interviews, and let you know about Product Management conferences in your area. And we promise, no spam.

THE END

Thank you for reading our book (or just flipping to this page)! We hope it was helpful. Make sure to leave us any comments and feedback by mailing us at

[contact@thepminterviewbook.co.in!](mailto:contact@thepminterviewbook.co.in)

THIS BOOK IS A SMALL ATTEMPT TO LEVEL THE PLAYING FIELD AND ENSURE THAT EVERYONE HAS ACCESS TO THE RIGHT MATERIAL NEEDED TO PREPARE FOR PRODUCT INTERVIEWS.

IT ALSO HAS A SECTION CONTAINING INTERVIEWS WITH VARIOUS PRODUCT MANAGERS, SO THAT PEOPLE CAN NOT ONLY FIGURE OUT HOW TO PREPARE FOR PM, BUT ALSO BETTER UNDERSTAND WHY THEY'RE PREPARING FOR THIS ROLE AND IF IT'S THE RIGHT FIT FOR THEM.

Akash Ramdas is a 2019 IIT Madras Graduate with a life motto of 'Sleep is for the weak/weak'. He can be found working on high-impact projects and unnecessary assignments with equal gusto, and is now pursuing a Masters Degree at Stanford university. When not probing bizarre problems, Akash can be found trying out a variety of highly unhealthy fizzy drinks.



Advaith Sridhar is a 2019 IIT Madras Graduate and an engineer with the curiosity of a five year old. He has the uncanny ability to engage (and bore) even the most disinterested of people in a debate on tech for hours. When not working on the next big thing at Flipkart (where he currently works as an Associate Product Manager), Advaith can mostly be found raiding the kitchen or asleep.