

# PRODUCT MANAGEMENT HANDBOOK

2023 - 2024



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## **ACKNOWLEDGMENT**

The recent years have seen the realm of product management witnessing a remarkable surge in demand, reflecting the critical role the product managers play in shaping innovative products that meet evolving market needs. This trend underscores the importance and need for a comprehensive guide tailored to equip the aspirants with the knowledge and skills needed to excel in this role. It is against this backdrop that the Product Management Club at BITSoM embarked on this journey of creating this Product Management Handbook, a testament to our commitment to fostering excellence in this field.

Our appreciation goes out to every member of the PM Club, both class of 2024 and 2025, for their invaluable contributions. The class of 2025 has demonstrated remarkable initiative in creating content and ensuring its relevance and coherence, while the class of 2024 has enriched this handbook with insightful inputs, meticulous proofreading, and substantive improvements, ensuring the content meets the highest standards of excellence. We also extend our deepest gratitude to our beloved institution, BITSoM for providing the club with the platform and the necessary support and opportunity to embark on such a significant project. This initiative would not have been possible without their support.



Lastly, but most importantly, we thank you, our readers, for your interest in and engagement with this handbook. Your keen interest and dedication to the field of product management are what inspire us to push the boundaries of what this handbook can achieve. We sincerely hope this handbook becomes a valuable tool on your journey, helping you to develop an excellent grasp of the concepts and equip you to seize the opportunities in this field with beaming confidence.

## PRESIDENT'S NOTE

This is a moment of immense pride and satisfaction, to see the fruition of our collective efforts, as we inaugurate the **First Edition** of our **Product Management Handbook 2023-24**. I would like to express my sincere gratitude to every single one of the PM Club members involved, in making this happen.

We've built this material after extensive research, and pruned it down to the absolute essentials, trying to give a comprehensive understanding to the reader. We truly hope it reaches great many PM aspirants and prove to be a priceless knowledge resource.

Cheers and best wishes for your preparation.



**Ravi Shankar**

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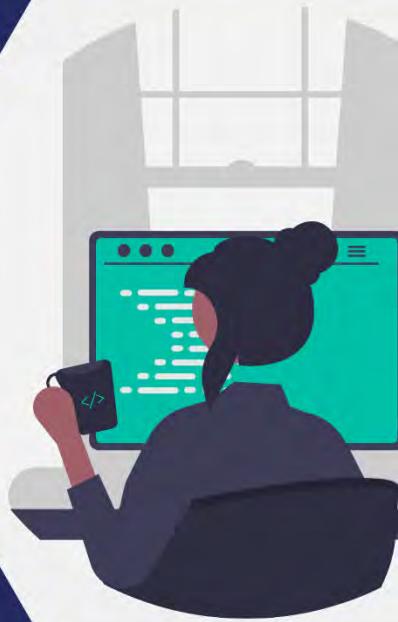
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# INTRODUCTION TO PM

## SECTION 1



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# INTRODUCTION TO PM

## 1.1 What is Product Management?

Product management is about making sure a product does well by bringing together different teams and planning out its journey. It's the business side of creating, launching, and taking care of a product or service from start to finish.

Product managers make sure the product matches what customers want and fits into the company's plans. They guide the product through every step of its life cycle.

## 1.2 Importance of Product Management

Product management acts as the bridge between different departments, ensuring that a product is created and brought to market in a way that satisfies customer needs and aligns with the company's overarching strategy and objectives. This involves conducting market research, understanding customer preferences, establishing product strategies, mapping out product development plans, and collaborating with diverse teams to bring the product to fruition.

Product managers are responsible for introducing new user experiences by linking user experience (UX) teams, technical teams, and business leaders to the product's vision. They continuously monitor performance and make necessary

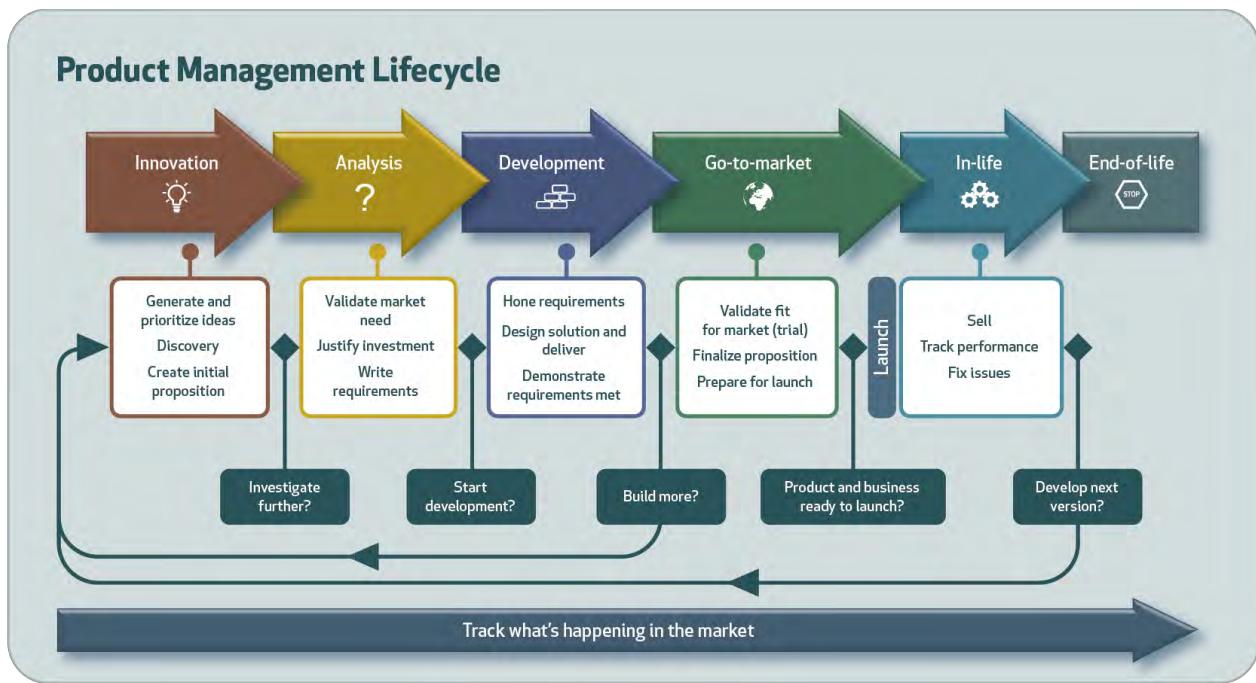
adjustments to keep the product competitive and successful.

Crucially, product managers define what success means for a product, set its strategic direction, and illustrate how it impacts both customers and the company's objectives. Their role as the voice of the product owner enables teams to navigate the varied interests of large and small enterprises.

Overall, product management plays a vital role in the development and prosperity of a company's products, ultimately driving the company's growth and profitability. It stands as an essential element of any successful product strategy, supported by effective product management tools.

## 1.3 Product Management Lifecycle

Developing and sustaining a successful new product isn't just a linear progression. By adopting the agile methodology, it can be cyclically revisited through a sequence of steps. Throughout the product lifecycle, various developments such as new feature suggestions, user requests, or emerging user segments may surface, which



Source: ProductFocus [Link](#)

necessitates the product's adaptation and responsiveness.

**Innovation Stage:** Generating and collating new ideas, then prioritizing the most intriguing ones, and envisioning the potential customer value proposition. This phase is akin to a 'discovery' stage. If an idea appears promising, a determination is made to allocate resources for further investigation.

**Analysis Stage:** Confirming the existence of a market demand, outlining the overarching requirements, and substantiating the investment. In numerous large corporations, this effort culminates in a business case that necessitates approval from senior management prior to commencing development.

**Development Stage:** The product undergoes design, construction, and testing phases. In Agile software development, this constitutes an iterative journey, often comprising multiple sprints. Each sprint is typically preceded by additional client exploration and analysis.

before determining the readiness to release a feature to customers.

**Go-to-Market Stage:** The company prepares for launch by conducting trials, refining the proposition, and ensuring readiness for product sales. For firms developing high-risk products in sectors like healthcare or aerospace, this process might extend over several months. Conversely, for companies offering online web-based products, this phase could be completed in minutes, given the continuous release of new functionalities.

**In-life Stage:** The emphasis lies on sales, performance tracking, and resolving any issues. Throughout the product's lifespan, numerous versions may emerge, each having undergone phases of innovation, analysis, development, and go-to-market planning.

**End-of-life Stage:** At a certain juncture, when the product becomes obsolete, it is phased out. Throughout the entire process, product management must monitor market dynamics and adapt to any shifts. Continuous evaluation of the product is

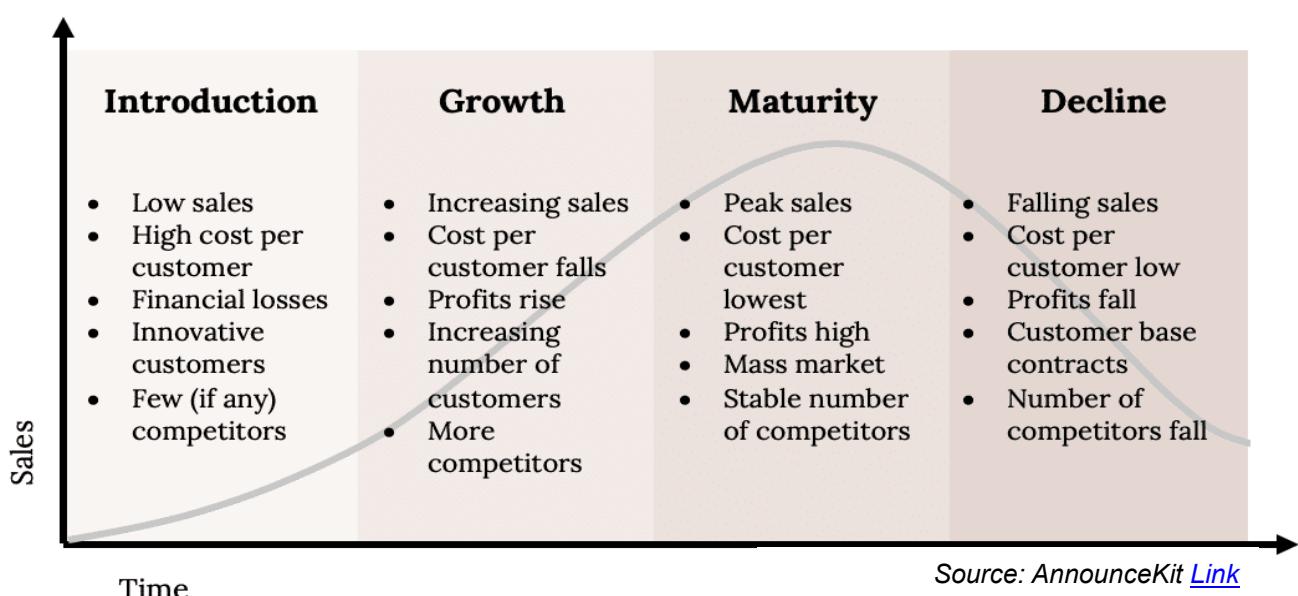
essential to respond to market changes, not only by introducing new products but also by enhancing existing ones to lower costs, enhance durability, and consequently boost profits.

Therefore, the aim of the product lifecycle is to fulfill various business objectives such as augmenting product revenues, optimizing the product portfolio, cutting production or associated costs, and ultimately increasing shareholder returns while ensuring customer satisfaction.

In essence, Product Lifecycle Management (PLM) serves four primary purposes:

- Enhancing Financial Performance
- Reducing Time-to-Market
- Improving Quality
- Driving Business Advancement

Additionally, PLM can be conceptualized in terms of its impact on Sales-Time, illustrating how it influences the sales trajectory over the lifespan of a product.



## 1.4 Product Manager vs Project Manager

### Product Manager

Product managers and project managers often have overlapping roles, leading to misconceptions. Product managers have a comprehensive responsibility throughout the product's lifecycle. In the conceptual stage, they conduct market research, generate the original product concept, and advocate for it internally. They rely on support from decision-makers and secure development funds. Product managers handle product marketing, launch activities, and ensure optimal user experience through product discovery and development.

In contrast, project managers focus on the development phase. They define the project scope, break down tasks, create a roadmap, and oversee implementation.

Product managers supervise the product management lifecycle and typically step in only when project managers encounter difficulties. Traditionally, a project manager's role was fulfilled once the product was ready, allowing marketing and sales teams to reap the rewards.

## 1.5 Role and Characteristics of a Product Manager

Product Managers bring vision, design, and user experience expertise to the table, thriving at the intersection of user experience, product development, and business. A key aspect of their role is to advocate for the user's perspective amidst the project's myriad stakeholders, including engineers, marketers, salespeople, and upper management. PMs champion the customer's needs and concerns, integrating them into the product's design process through methods like interviews, surveys, testing, and social media engagement.

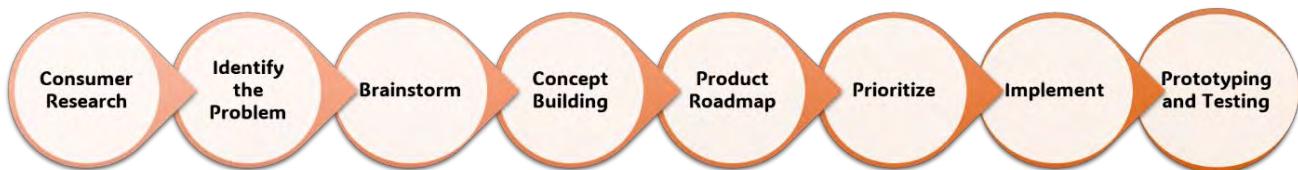
For PMs, it's crucial to have a clear understanding of the problem their product aims to solve and how it offers a unique solution. They must articulate the product's distinctive value proposition, especially in a competitive market landscape. Without this

clarity, successful product management is unattainable.

PMs conduct thorough research on their product's strengths and weaknesses, as well as those of competitors, ensuring alignment with real customer needs. Effective communication of these insights to design and production teams enables the delivery of innovative, high-quality products poised for success. Ultimately, the goal of the Product Manager is to drive successful product innovation and sales.

Successful Product Managers often come from diverse backgrounds, as their responsibilities encompass various stages of the product lifecycle. Their involvement spans visioning, research, design, development, marketing, sales, launch, support, and eventual product wind-down.

## 1.6 Ideal Workflow of a Product Manager



Product Managers often employ several best practices such as:

### a. Consumer Research:

The initial phase of product management involves comprehending your target consumer and the market you aim to enter, encompassing its dimensions, competitors, and prevailing trends. Start by crafting your ideal buyer persona. Pose questions such as:

- Who is your ideal consumer?
- What are their likes and dislikes?

- How do they prefer to access information?
- Compile detailed information about this persona and approach it as if it were a real individual.

### b. Identify the problem:

Discovering a problem often serves as a catalyst for innovative ideas, particularly in product management, where the focus is on identifying challenges that impact your target market and devising solutions. By

scrutinizing your buyer persona and posing questions like the following, you can uncover pain points:

- What matters most to them?
- What questions do they typically search for online?
- Are there recurring issues among them?
- Is this problem exclusive to them?
- Is there a viable solution to address this problem?

Product managers can inspire other stakeholders to collaborate on finding a solution by leveraging the clearly defined problem as a starting point.

#### **c. Brainstorm:**

Product managers have the opportunity to collaborate with engineers, marketers, and customers to generate ideas. Conduct interviews with potential consumers, delving into their product experiences within your business. Pose insightful follow-up questions, probing into the reasons behind their feelings or beliefs.

Leverage the problem identified in the previous stage to engage with internal stakeholders. The goal is to demonstrate to potential clients that your company possesses the capability to address their issues with a product. Customer interviews can also facilitate these discussions.

Encourage internal teams and stakeholders to share their ideas openly, without judgment. It's important to remember that even seemingly bad ideas can spark innovation. Document these ideas for future reference and use them as inspiration during the product conceptualization phase.

#### **d. Build the Concept:**

Once all relevant input has been collected, it's crucial to narrow down to a single,

robust direction for the organization. This can involve selecting a standout idea from one source or integrating elements from various themes. Subsequently, review the product specifications to ascertain what should be encompassed in the proposed product. Develop a document that addresses the following questions:

- What form will the product adopt?
- How does it address the identified issue?
- What features and components are essential for the final product?
- How will the company assess the product's effectiveness?

Product managers are tasked with either directly building products or providing guidance and recommendations on them.

#### **e. Establish a Product Roadmap:**

A product roadmap delineates every stage of the development and launch process. It incorporates dates, objectives, and Key Performance Indicators (KPIs) to ensure the project stays on course. Your product roadmap should encompass the following elements:

- Concrete dates and deadlines for achieving each milestone
- Tasks delineating how each contributes to the product's success
- Designation of individuals responsible for meeting specified milestones
- Metrics utilized to gauge the success of the project

#### **f. Prioritize features:**

Feature prioritization becomes essential once you've established high-level goals in your roadmap, determining how much effort to allocate to developing different features. Consider each feature's contribution to the final product, its effectiveness in addressing user needs,

and the resources required to implement it. If a feature with a lower impact demands significant time and resources but offers minimal enhancement to user experience, it may be preferable to prioritize a feature with greater impact, even if it takes longer to complete.

#### **g. Implement the plan:**

Once a roadmap is established and features are prioritized, the product manager can proceed to issue instructions. Alternatively, product managers with strong technical skills may take on hands-on responsibilities, assisting programmers in product creation.

Two commonly employed delivery models are Agile and waterfall. Agile methodology involves iterative product releases, integrating consumer feedback with each release. Conversely, the waterfall process follows a more rigorously controlled approach, with products distributed only after receiving final approval.

#### **h. Rapid Prototyping and Testing:**

Following the release, the product management process persists. Product managers evaluate the product's performance and pinpoint areas for enhancement. They engage with users to gather feedback, addressing any issues or questions they may have regarding the product. Additionally, product managers collaborate with internal stakeholders, communicating critiques and recommendations for improvement. This ongoing feedback loop ensures continuous refinement and optimization of the product.

### **1.7 Types of Product Managers**

Apart from generalist Product Managers, specialized roles are tailored to unique strengths and interests. These roles encompass nine distinct types of Product Managers.

**Digital product manager:** They spearhead the strategy for web-based products, overseeing applications, websites, and digital services to ensure seamless user experiences. Amidst the ever-evolving digital landscape, Digital Product Managers (DPMs) adapt by continually optimizing products to align with shifting online behaviours.

**Key skills:** Understanding user behaviour, UX/UI principles, A/B testing, product strategy, and data analytics.

**Product marketing manager:** Product marketing managers, true storytellers at heart, specialize in crafting narratives and defining brand voices. They dive deep into market research to ensure that products resonate with target customers. Beyond merely identifying market trends, these product managers orchestrate the go-to-market (GTM) plan, ensuring the successful launch and promotion of products.

**Key skills:** Market segmentation, GTM strategies, buyer persona development, achieving product-market fit (PMF), and sculpting product vision.

**Growth product manager:** These professionals specialize in leveraging product features as sales tools to drive business expansion. They primarily operate within product-led growth (PLG) businesses, where the product itself acts as the catalyst for growth. By closely analysing user behaviours and pinpointing areas of growth, growth product managers collaboratively enhance metrics to facilitate business growth.

**Key skills:** User behaviour analysis, cross-functional team collaboration, A/B

*testing, data-driven decisions, and product strategy.*

**Technical product manager:** Where Software meets strategy, these individuals are entrusted with managing niche products tailored for developers and tech enthusiasts. They seamlessly blend technical expertise with a clear product vision, ensuring that technology not only operates smoothly but also captivates its specialized audience.

**Key skills:** Deep technical understanding, product vision, collaboration with engineers, and feedback loop establishment.

**AI product manager:** If algorithms and neural networks are your playground, you might want to explore the relatively new field of AI product management. This role involves striking a balance between technical AI expertise and product strategy to ensure that AI-powered products are not only intelligent but also profitable.

**Key skills:** AI expertise, data analysis, product-market fit (PMF), monetization strategies, and customer-centric design.

**Product analyst:** Diving into vast pools of data, product analysts transform numbers into compelling narratives. Focused on data-driven insights, they propose product adjustments and oversee ongoing enhancements. Through deciphering patterns and offering informed recommendations, they play a pivotal role in the creation of superior products.

**Key skills:** Data analysis, A/B testing, pattern recognition, user behaviour understanding, and product strategy insights.

**Product owner:** Strategically aligned with the product manager, they ensure that daily tasks are in sync with the broader objectives. Grounded in the Scrum framework, they prioritize and synchronize tasks with overarching goals. Individuals who excel in pragmatic decision-making often find themselves drawn to this role.

**Key skills:** Scrum framework knowledge, strategic alignment, user story creation, backlog management, and collaboration.

**Platform product manager:** Beyond individual products lies the realm of the platform product manager. They prioritize tasks and uphold a unified user experience by fostering synergy across various products. Their comprehensive viewpoint allows them to perceive products from a holistic perspective, frequently addressing internal technical obstacles.

**Key skills:** Tech stack understanding, cross-product strategy, internal stakeholder management, build vs. buy decisions, and scalability.

**Product operations manager:** These play a vital role in supporting the entire product team, cultivating an efficient environment for product managers to excel. Unlike traditional PMs who focus primarily on users, the main clientele for POMs is the product team itself. Their essential responsibilities include optimizing systems and processes, promoting transparent communication, and leveraging data insights to support product management efforts.

**Key skills:** Systems optimization, clear communication, data synthesis, task delegation, and cross-functional collaboration.

# KEY TERMS & METHODS



## 2.1 Design Thinking

Design Thinking is a structured approach that assists product managers in generating innovative solutions to challenges. It recognizes the importance of design in effective product management. By collaborating closely with designers, product managers can develop products that are not only functional but also visually appealing.

At its core, Design Thinking emphasizes three main principles: collaboration, empathy, and experimentation. Collaboration entails involving all stakeholders in the design process from the outset, ensuring that everyone's input is considered and the project's objectives are well-understood.

The fundamental principles of Product Design thinking are:

**Empathy:** Product managers gain insight into users' needs, motivations, and challenges, fostering empathy and enabling the creation of products that effectively address user needs and provide value.

**Collaboration:** Encouraging diverse perspectives and cross-functional teamwork fosters the generation of innovative ideas and ensures a shared

understanding of the product's objectives and requirements among team members.

**Experimentation:** Embracing a culture of experimentation, rapid prototyping, and testing enables teams to quickly validate ideas, gather feedback, and refine their product offerings iteratively.

**Iterative process:** Design Thinking follows an iterative, non-linear approach, allowing teams to revisit previous stages and refine their understanding, ideas, or prototypes based on new insights or feedback. This iterative nature promotes continuous improvement and refinement throughout the product development lifecycle.

### Product Thinking vs Design Thinking:

Design Thinking prioritizes understanding user needs and generating creative solutions through an iterative process. It's commonly applied in the initial stages of development to ensure that products or services are focused on the user.

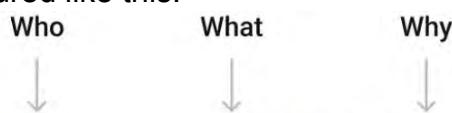
In contrast, Product Thinking places a greater focus on business objectives and strategy. It strives to address problems that align with both user needs and business goals across the entire product lifecycle, spanning from idea generation to launch and beyond.

## 2.2 User Persona and User Journey

A **user persona** is like a made-up character that represents your typical customer, based on real data or your ideal customer. You create personas by talking to users and sorting them by things like age, interests, and behaviours. This helps you understand your customers better and improve how you market your product.

User personas are super important for businesses because they show you how real people search for, buy, and use products. By focusing on these personas, you can make your product better suited to your customers' needs and preferences.

A **user story**, on the other hand, is a short sentence that tells a fictional story from the perspective of one of your personas. It helps guide design decisions by highlighting what the user wants or needs from your product. A typical user story is structured like this:



As a **type of user**, I want to **action**, So that **benefit**

Creating a user story is a valuable step when you're designing your product. It helps ensure that you're tackling the important problems your users might encounter. Think of user stories as a checklist to guide your design process.

Now, a user journey is the path a user takes to accomplish a specific goal. It's built upon the persona and user stories. User journeys are crucial because they help you understand and empathize with your users' experiences. A journey map is like a visual representation of this path, showing each step a user goes through to achieve their goal.

Using a user journey map helps counteract designer bias, which is when designers unintentionally design based on their own preferences rather than the users' needs. By documenting the entire sequence of events and interactions in a user journey map, you can focus on understanding how your persona thinks and feels at each stage of their journey, rather than just relying on your own perspective. This ensures that your product meets the needs of your users effectively.



User Journey Map

Source: CodeAcademy [Link](#)

## 2.3 Minimum Viable Product (MVP)

A Minimum Viable Product (MVP) is a basic version of a product created to test a new idea or solution without spending a lot of money or time. It's stripped down to its essentials but still capable of meeting its goals.

The purpose of an MVP is to gather feedback from your target audience promptly. This feedback helps assess how well your concept performs and whether there's demand for it. By doing so, you can decide whether to keep refining the product or change course if needed.

## 2.4 Product Requirements Document (PRD)

A Product Requirements Document (PRD) is a detailed document that outlines the important features, functions, and needs of a planned product. It's crucial for defining the scope of work required to build the product and estimating the effort needed.

One of the main benefits of having a PRD is that it reduces misunderstandings and disagreements among team members during development. It ensures everyone is on the same page regarding what's necessary for a successful product. Additionally, it keeps all stakeholders informed about the features and functions that should be incorporated into the final product.

## 2.5 Product Roadmap

A product roadmap is like a blueprint for how a product will develop and be released over time. It's essential for managers to grasp the product's direction and delivery to customers. It guides decisions on which features to include, which to remove, and when new versions should roll out.

The cornerstone of a solid product roadmap is predictability. It should be understandable to all involved in its creation yet adaptable to changes. This means regularly updating it as new information emerges and documenting any alterations made to the original plan.

## 2.6 Agile Methodologies



Source: *TheProductManager* [Link](#)

**Agile** is a project management philosophy that breaks down goals into smaller, manageable tasks, delivered in short

cycles. This allows teams to quickly adapt to changes, address issues, and reduce costs and inefficiencies.

Using Agile brings several benefits: faster delivery times, cost reduction, improved communication and teamwork, and better flexibility in responding to changes.

In Agile product development, the focus is on efficiently transitioning from planning to execution. This enables teams to receive feedback sooner and make adjustments more frequently, resulting in smoother progress and higher-quality products.

**Scrum**, a specific Agile methodology, is tailored for environments prone to change. It operates in short delivery cycles known as "sprints," typically lasting one to four weeks. Work is incremental, building upon previous efforts. Scrum teams are small, comprising a Scrum Master, a product owner, and developers. Communication is consistent to ensure continuous feedback and prompt adjustments.

Key similarities between Scrum and Agile include short-term development cycles, emphasis on collaboration and communication, and the ability to adapt to changes and feedback.

However, Scrum differs from other Agile methodologies in several ways: it organizes work into sprints, maintains a product backlog, assigns specific roles (Scrum Master, product owner, development team), and conducts daily Scrum meetings for updates.

## 2.7 Continuous Integration & Deployment (CI/CD)

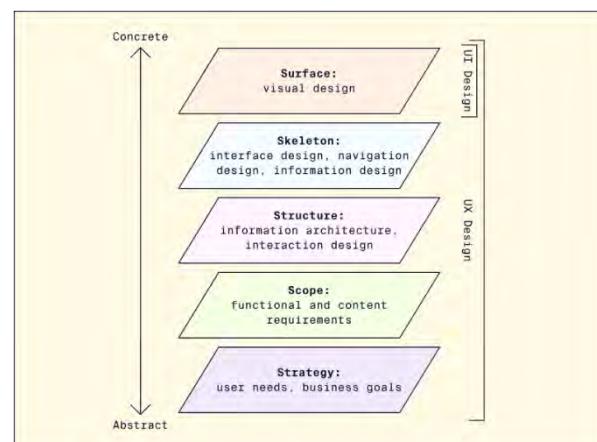
**Continuous Integration (CI)** is a software development approach that ensures every code change is quickly tested and merged into the main codebase. This prevents issues like "integration hell" where multiple changes conflict, making it hard to track what caused problems. CI also reduces the

chance of introducing unexpected bugs, making development smoother.

**Continuous Deployment (CD)** takes this further, automatically releasing updates frequently without manual intervention. This keeps products current and available to users, minimizing errors and meeting user needs promptly. CD relies on automated testing, deployment, and version control systems to achieve seamless updates.

## 2.8 UI/UX Design Methodologies

**Design methodologies** are models that provide a definite structure to solve problems and come up with innovative solutions in the design process.



### 5 Elements of UX Design

Source: CodeAcademy [Link](#)

**User interface (UI) design** is a design discipline focused on the visual design of the interface through which users interact with a product or system. UI design considerations include:

**Layout:** Where do elements appear on the screen?

**Colours:** What palette is used and what emotions do those colours evoke?

**Typography:** What typefaces are used and what do they communicate?

**Interaction design:** How do elements respond to user interaction?

**Brand identity:** How do all of the visual elements come together to represent the brand's vision?

**Responsiveness and usability:** Is the interface easy to use across different devices?

**Accessibility and inclusivity:** Does the interface work for everyone?

**Front-end development:** What is the technical backbone powering the interface?

**User experience (UX) design** is a human-centred design discipline that deals with the holistic experience around a product or service, taking into consideration the user, system, and context.

User experience (UX) design focuses on:

**User journey:** The entire process surrounding the use of a product, from the problem to be solved through the impact of the solution.

**User research:** Qualitative and quantitative research to put the user at the centre of the design process.

**Deliverables:** Documents that define the users, user experience, workflows, and features of a product or design

## 2.9 Gantt Chart



A Gantt chart is a visual tool used in project management to plan and monitor task progress. It's widely utilized in product management to manage deadlines and ensure timely task completion.

This chart displays time frames, typically organized by days, months, or years, with each column representing a specific task or project stage. The bars within the chart represent the duration allocated for each task, while different colours denote various stages of completion.

## 2.10 Key Performance Indicators (KPIs)

Key Performance Indicators (KPIs) are metrics used to gauge the success of a product or service by measuring progress against specific goals. KPIs are distinguished based on four aspects

**Timeliness:** Ensures project activities are completed on schedule, allowing for estimation of completion dates if behind schedule.

**Quality:** Evaluates the quality of work done and the project team's benefit from the development process.

**Budget:** Determines the amount of funding allocated for the project and monitors if it exceeds the budget.

**Effectiveness:** Monitors resource allocation and usage to ensure efficient utilization.

There are many different types of KPIs, but some common examples include:

**Conversion rate:** Measures the percentage of website visitors or whitepaper downloaders who become paying customers.

**Customer satisfaction rate:** Assesses customer happiness with the product or service based on feedback.

**Net promoter score:** Evaluates customer loyalty and engagement by asking their likelihood of recommending the product to others.

## 2.11 Feature Prioritization

Feature prioritization is the method of arranging and ranking product features according to factors like customer benefit, business objectives, time and cost requirements, and technical feasibility.

Product managers rely on feature prioritization frameworks to avoid being overwhelmed and making suboptimal decisions. These frameworks enable managers to assess the value of various features, aiding in deciding which ones to focus on initially. Moreover, they assist in handling customer feedback and ensuring team alignment.

Several feature prioritization frameworks include:

**Weighted Scoring** - Assigns scores to features based on importance and user needs, then ranks them by total score.

### RICE Method –

**R: Reachability** - How many users can benefit from the feature?

**I: Impact** - How significant is the feature's impact?

**C: Confidence** – How certain are we about the impact?

**E: Effort** - How much effort is required to implement the feature?

**Value Vs Effort** - Compares the benefits of a feature against the effort needed for implementation.

**Kano Model** - Classifies customer needs into basic, performance, and delight categories.

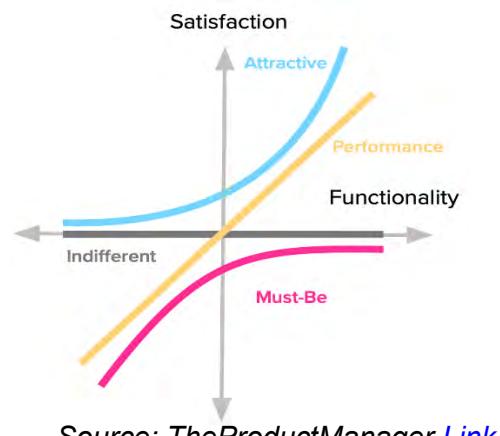
**Story Mapping** - Organizes features hierarchically to illustrate dependencies.

**MoSCoW Method** - The MoSCoW Method is a prioritization framework that categorizes features into four priorities:

- **MUST** features are top priority and need to be implemented as soon as possible because they are critical to the product's success.
- **SHOULD** are important but can be implemented after the MUST features. They are necessary for the product's overall functionality and value.
- **COULD** features are less critical and can be implemented if time and resources allow. They are considered optional and can enhance the product if included.
- **WON'T** features do not add value and should not be implemented.

**Cost Of Delay** - Prioritizes features by considering business value, delay risks, and user experience impact.

## 2.12 Kano Model



The Kano Model is a tool used by product managers to prioritize features and create a roadmap for their products. It acknowledges that different types of product features have varying impacts on customer satisfaction.

The model aims to guide product managers in striking a balance between what features they offer and how they deliver them, ensuring that their products are successful and align with the needs of their target audience. By understanding the strengths and weaknesses of each type of product feature, managers can make informed decisions to meet customer expectations effectively.

## 2.13 A/B Testing

A/B Testing is a method to evaluate the effectiveness of different versions of a product or service before its official launch. The aim of beta testing is to identify and address any issues or bugs before the product or service is made available to the public. This ensures that the final release is as flawless as possible.

Various approaches can be used for A/B testing, such as comparing different versions on a small scale, offering early access to a select group of users, or conducting a controlled beta test with a specific customer group. These methods help gather valuable feedback and insights to refine the product or service before its full-scale release.

## 2.14 Go-To-Market (GTM) Strategy

The go-to-market strategy (GTM) is a comprehensive plan product managers use to introduce new products to the market. It involves steps like creating a business case, designing the product, crafting marketing and sales strategies, and finally launching the product.

When developing a GTM strategy, product managers must consider various factors, such as customer needs, competition, market conditions, and budget limitations. The objective is to identify the most effective and efficient approach to reach the target market while ensuring profitability.

# INDUSTRY PRIMERS

## SECTION 2



BITS SCHOOL  
OF MANAGEMENT





## WHAT IS E-COMMERCE?

E-commerce (electronic commerce) involves the buying and selling of goods and services over an electronic network, primarily the Internet.

In an e-commerce company, the 'product'—the primary reason customers engage with your brand and exchange money for interacting with it—isn't just the app. It's the overall experience, encompassing browsing, ordering, and receiving a package at your doorstep.

Below are 6 Types of E-Commerce:



## USER PERSONAS

In the context of e-commerce platforms, the typical set of users includes:



## PLATFORM STRUCTURE

The platform can be divided into key screens that serve as important landing points, facilitating a better understanding of the customer journey. The main screens include:

**Home Screen:** The initial landing page on mobile or web applications, offering a brief overview of available categories.

**Product Listing Page:** Allows users to filter and sort products based on various parameters for a streamlined selection process.

**Product Description Page:** Provides detailed information about the product, including pricing, customer ratings, and suggestions for similar products.

**Cart Page:** Lists all products added to the cart, allowing users to modify selections. The total cart price, along with available offers, is displayed for easy reference.

**Payment Page:** Involves delivery address selection, customer details, and various payment options.

**Order Tracking Page:** Displays delivery status, invoice details, estimated delivery time, and provides customer service options.

## USER JOURNEY

1. Customer Acquisition – 3 Primary Channels:
  - a. Direct: Users land directly on the app by entering the URL.
  - b. Organic: Arrive via a search engine.
  - c. Paid: Arrive through advertisements for which the platform paid.

2. Product Search:
  - a. Typing in the search bar.
  - b. Menu navigation.
  - c. Home page recommendations.
  - d. Category listings.
  - e. Sponsored products.
  - f. Landing through a search engine.
3. Select Customizations and Add to Cart.
4. Scheduling – Location, Date, Time.
5. Payment – Mode of Payment, Offers.
6. Place Order and Track for Arrival.
7. Delivery of Product (Offline or Online).
8. Returns and Replacement if Needed.

## LEADING TRENDS IN E-COMMERCE

The E-Commerce industry is continually evolving to meet customer needs and provide a satisfying user experience.

Some of the biggest trends include:

1. **Augmented Reality Enhancing the Shopping Experience:** Providing a better feel for items without the need for in-person viewing.
2. **AI and ML Personalization:** Enabling customers to have a personalized experience by continuously collecting data on their shopping patterns.
3. **Increasing Chatbot Technology:** Replicating the in-store sales associate with advanced technology to assist in product selection and troubleshooting.
4. **Growing Prevalence of Voice Search:** Optimized for multiple languages.
5. **Subscription Models on the Rise:** Keeping customers loyal and providing added benefits for increased satisfaction.
6. **Personalized Advertising:** Utilizing online tracking technologies and machine learning to deliver advertisements tailored to customer preferences.

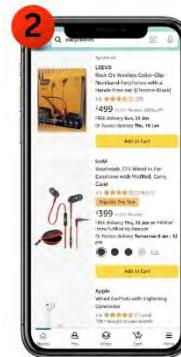
## USER JOURNEY OF AMAZON

**Home Screen**  
Popular deals, Category listings, Previously viewed items, and recommendation



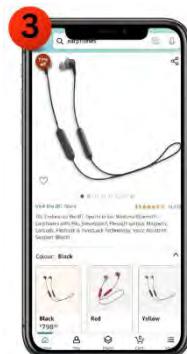
### Search Screen

Price, Ratings, Delivery date, colour options listed here. Contains sponsored products in between.



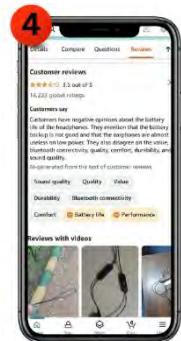
### Product Screen

All specifications of a product. Each product variation listed below with price.



### Customer Reviews

AI generated customer review prompt and major keywords extracted with a review.



### Cart Screen

Lists all options added to cart with option to directly add quantities. Can save for later and view delivery ..



### Confirmation

Confirmation of purchase with estimated delivery time. Option to track order and edit if needed.





# RIDE TECH

## WHAT IS RIDE-HAIL TECH?

Ride-hailing involves customers ordering a personalized ride through a platform that acts as a mediator between the driver and the passenger. Ride technology has evolved significantly, primarily driven by increased transparency for both drivers and passengers. This heightened transparency has led to a surge in app usage, transforming these services into a modern-day necessity.

## USER PERSONAS

The major user personas opting for ride-hailing apps include:

1. Individuals without personal vehicles.
2. Those seeking affordable transportation options.
3. Non-drivers who rely on alternative transportation.
4. Individuals in need of premium ride services.
5. Travelers who are visiting and do not have their own transportation.
6. Regular commuters choosing to avoid the daily hassle of driving.

## VALUE PROPOSITIONS

The Ride hailing apps have different value propositions to Customers and Drivers

which provide a competitive advantage over the traditional apps. Few of them include:

### To PASSENGERS:



### To DRIVERS:



## USER JOURNEY

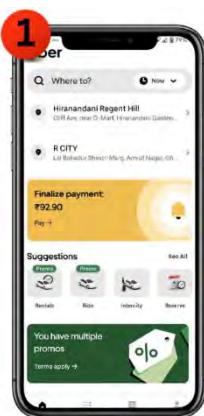
1. Enter your current location and the destination address.
2. Browse and choose from various car ride options by comparing their prices.
3. Avail any available offers to optimize your ride experience.
4. Choose a suitable payment method.
5. Confirm your ride and await the driver's acceptance.
6. Once your ride is confirmed, receive the details and track arrival for the estimated time of arrival.

7. Contact the driver by calling or messaging.
8. Share the One-Time Password (OTP) for authentication purposes.
9. Throughout your travel journey - track the movement of the cab, utilize in-car features, or complete the payment.
10. Upon reaching your destination, make the final payment.
11. Rate both the driver and the overall service received.

## USER JOURNEY OF UBER

### Home Screen

Contains frequently travelled locations, suggestions for mode of transport and pending payments


**1**

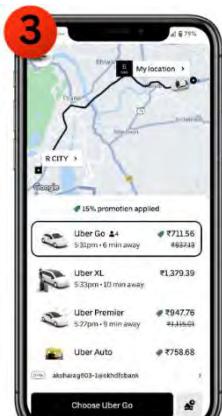
### Search Screen

Select source and destination. Option to book for self or others, schedule pick up time and book 1 way or 2 way


**2**

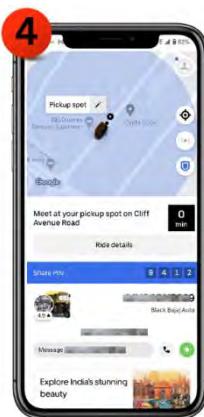
### Ride Options

Select from available ride options. Price and promotions are listed. Payment option also selected here


**3**

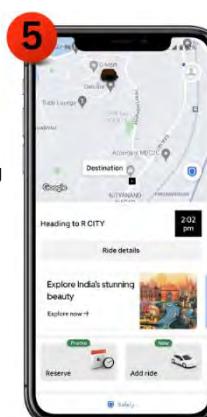
### Ride confirmed

On assigning a driver, vehicle number and driver number available. Rider can message or call driver.


**4**

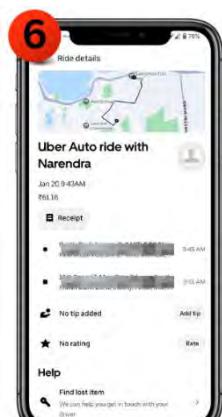
### Start Ride

To start ride, OTP is shared. During ride, location tracking can be done. Safety options available.


**5**

### Ride Completion

Ride details are shared with payment receipt. Option to receive any help related to ride.


**6**

# FOOD TECH



## WHAT IS FOOD TECH?

Food tech industry offering online food delivery and restaurant discovery services. They operate as on-demand delivery platforms connecting users with a diverse range of restaurants and also provide a comprehensive food-tech ecosystem encompassing restaurant reviews, online table reservations, and food delivery. Their success highlights the transformative impact of technology on the food and restaurant sector, providing convenience and choice to users while reshaping traditional dining experiences.

## DIFFERENT BUSINESS MODELS

This industry constitutes of many business models including the following major ones.

1. Restaurant Aggregator:
  - Hosts a variety of nearby restaurants on a single platform.
  - Examples: Swiggy, Zomato.
2. On-Demand Food:
  - Owns centralized kitchens for efficient food preparation.
  - Takes orders directly through their websites or apps.
  - Example: Freshmenu.
3. Ready-to-Heat Food (Subscription Models):
  - Delivers pre-prepared meals that can be heated and consumed

- No need for cooking; convenient for users.
  - Example: Daily Harvest, Freshly
4. Recipe Discovery and Instructions:
    - Provides platforms for discovering new recipes.
    - Offers step-by-step instructions
    - Example: TasteMade.
  5. Personalized Nutrition:
    - Creates individualized diet plans based on preferences and goals.
    - Eg: InsideTracker

## COST STREAMS



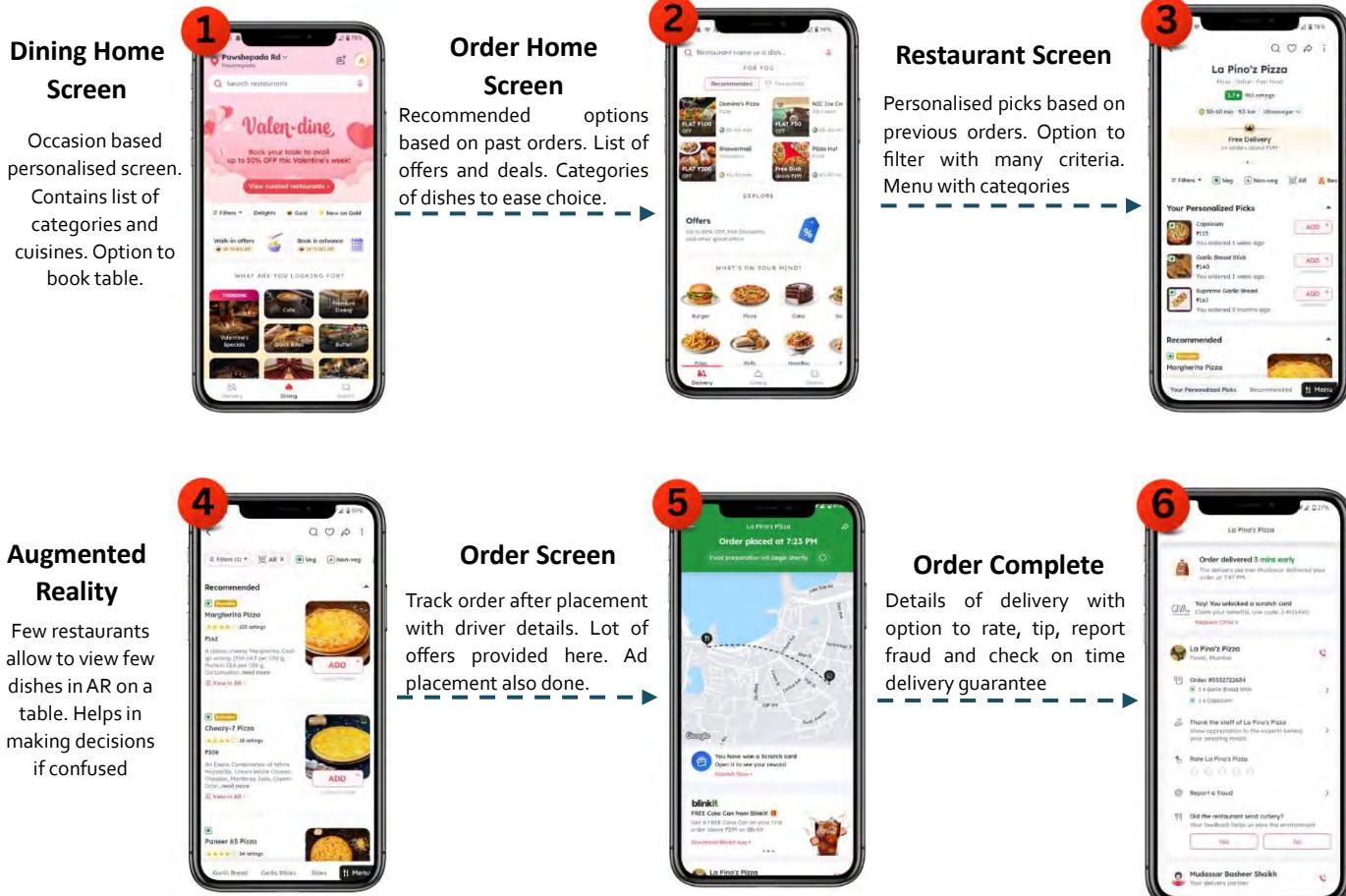
## REVENUE STREAMS



## USER JOURNEY

1. App Download and Registration
2. Location and Cuisine Selection:
  - Users input their delivery address
  - Browse through a variety of cuisines
3. Restaurant and Menu Exploration:
  - Users explore different restaurants
  - View restaurant ratings and may filter their search
4. Menu Item Selection:
  - Users select individual items or meals
5. Adding to Cart and Checkout:
  - Add selected items to cart.
6. Delivery and Payment Options:
  - Users choose preferred delivery time
  - Users select a payment method
7. Order Confirmation:
  - Receive an estimated delivery time.
  - Users can track the real-time status
8. Delivery and Feedback:
  - Users receive the order and may provide feedback or reorder

## USER JOURNEY OF ZOMATO





# TRAVEL TECH

## WHAT IS TRAVEL TECH?

It is the application of IT and e-commerce solutions in tourism, travel, and hospitality to automate travel, save time, reduce costs, and create a seamless travel experience for consumers, including before, during, and after a trip.

## EFFECT OF THE PANDEMIC

This industry was hit severely because of the pandemic which was affected in:

**Drastic Reduction in Travel Demand:** caused a sharp decline in bookings, leading to substantial financial losses for the travel tech industry.

**Financial Strain and Refund Challenges:** Companies faced financial strain due to widespread cancellations and refund requests.

**Job Losses and Layoffs:** The industry witnessed significant job losses as travel tech companies implemented cost-cutting measures to cope with economic downturns.

**Operational Challenges and Uncertainty:** They had to adapt to new regulations and manage plans amidst uncertainty and volatility.

## USER PERSONAS

**Solo Travelers:** Use travel tech to plan trips, find accommodations, and navigate new destinations with or without other groups.

**Friends:** Utilize travel tech to coordinate trip planning, share itineraries, and find group-friendly activities.

**Couples:** Use travel tech to find romantic getaways and discover couple-friendly activities or dining options.

**Families:** Benefit from travel tech for booking group accommodations, finding child-friendly activities, and ensuring family safety during travel.

## VALUE PROPOSITION

**Bookings:** Hassle-free bookings for flights, hotels, and activities, providing a seamless and efficient process for user travel needs.

**Compare Prices:** Empower user choices with price comparisons across various providers.

**Services Provided:** Comprehensive suite of travel services, including car rentals, airport transfers, and travel insurance, all in one place for a convenient and integrated travel experience.

**Discounts:** Exclusive discounts and special offers to maximize savings.

**Itinerary Drafting:** Access detailed information about destinations and streamline travel plans.

## CUSTOMER JOURNEY



## NEW TECH IN TRAVEL

**AI and ML:** Personalized recommendations based on past behaviour and preferences.

**Augmented Reality and Virtual Reality:** Enable users to explore destinations before making a booking, providing immersive experiences.

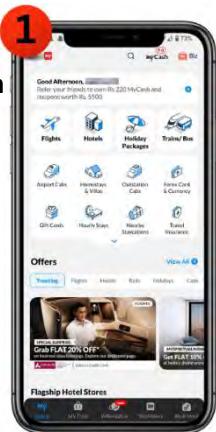
**Voice Search and Natural Language Processing:** Integrated voice search capabilities ensure easy accessibility of the platform.

**Chatbot Features:** Assist users in queries and facilitate the booking process.

## USER JOURNEY OF MAKEMYTRIP

### Home Screen

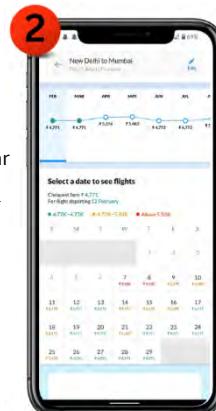
List of all options of services available for booking from travel to stay. Promotional offers listed



1

### Flight Fare Calendar

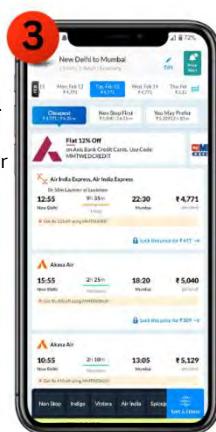
Feature to find the best flight fares across all dates of the year



2

### Flight Finder

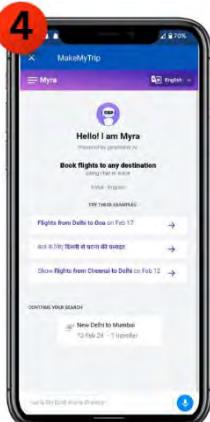
List of all flights with trip details. Options to filter based on multiple criteria and lock price for future.



3

### Voice Chat

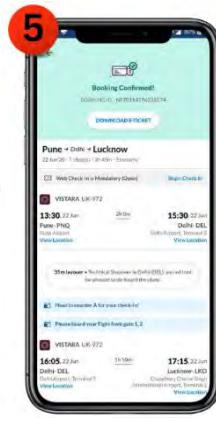
Voice assistant to aid booking with option of multiple languages



4

### Booking Confirmation

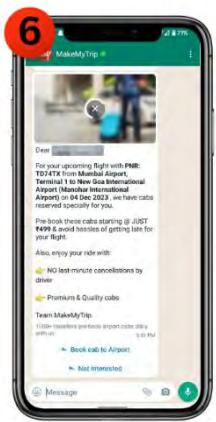
Booking confirmation screen after payment completed. Option to do check-in if open



5

### Post booking service

Post booking, whatsapp messages to aid in easier travel experience with hotel and ride bookings with offers



6



## WHAT IS HEALTH TECH?

Health tech applications are becoming increasingly popular for consulting and other services in the healthcare industry. These applications leverage technology to improve healthcare delivery, enhance communication between healthcare providers and patients, and streamline various processes.

## WHAT SERVICES ARE PROVIDED?

This industry has witnessed a transformative wave driven by technological advancements, giving rise to innovative solutions such as:

**Telemedicine Platforms:** Enable remote consultations between healthcare providers and patients through video, voice, or chat.

**Electronic Health Record (EHR) Systems:** Store and manage patient health records digitally.

**Health Chatbots:** Provide instant health information, answer queries, and offer preliminary medical advice.

**Lab Test Booking:** Facilitate the scheduling and management of laboratory tests.

**Pharmacy Medicine Distribution:** Enable the ordering and delivery of prescription medications through online platforms.

**Wearable Health Tracking:** Connect with and collect data from wearable devices to monitor and analyze users' health metrics.

**Symptom Assessment Applications:** Assist users in assessing their symptoms, providing initial information and recommendations.

**Nutritional Guidance Apps:** Offer nutritional advice, track dietary habits, and provide information on the nutritional content of food.

**Sleep Monitoring Applications:** Monitor and analyse users' sleep patterns, providing insights and recommendations for improvement.

**Meditation Apps:** Offer guided meditation sessions, mindfulness exercises, and stress-relief techniques to promote mental well-being.

## SEGMENTS OF USERS



## REVENUE MODEL

Main sources of revenue include:

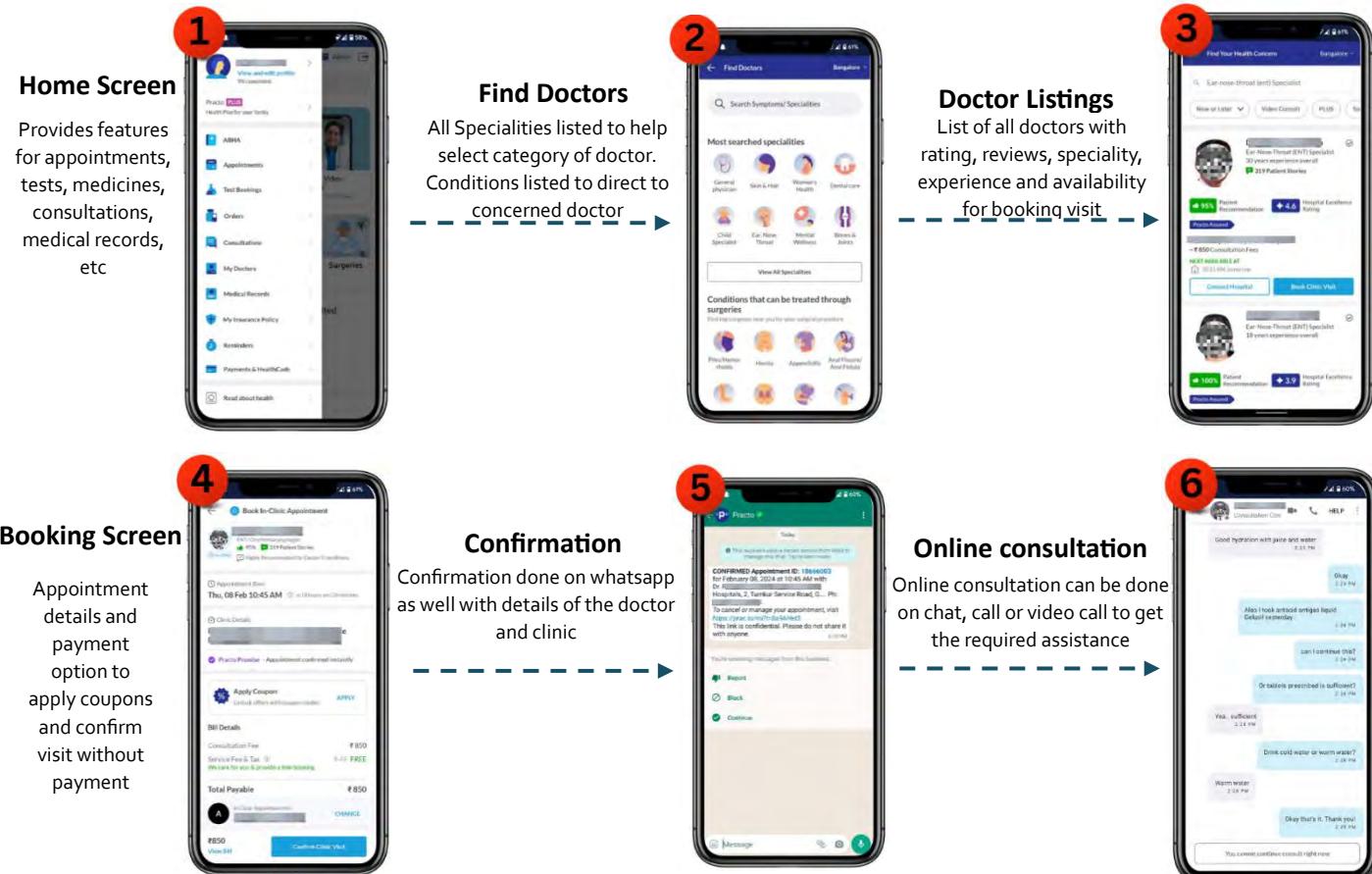
1. Commissions on Bookings
2. Subscription Plans
3. Delivery Charges
4. Paid Services
5. Advertising
6. Data Licensing and Analytics
7. In-App Purchases

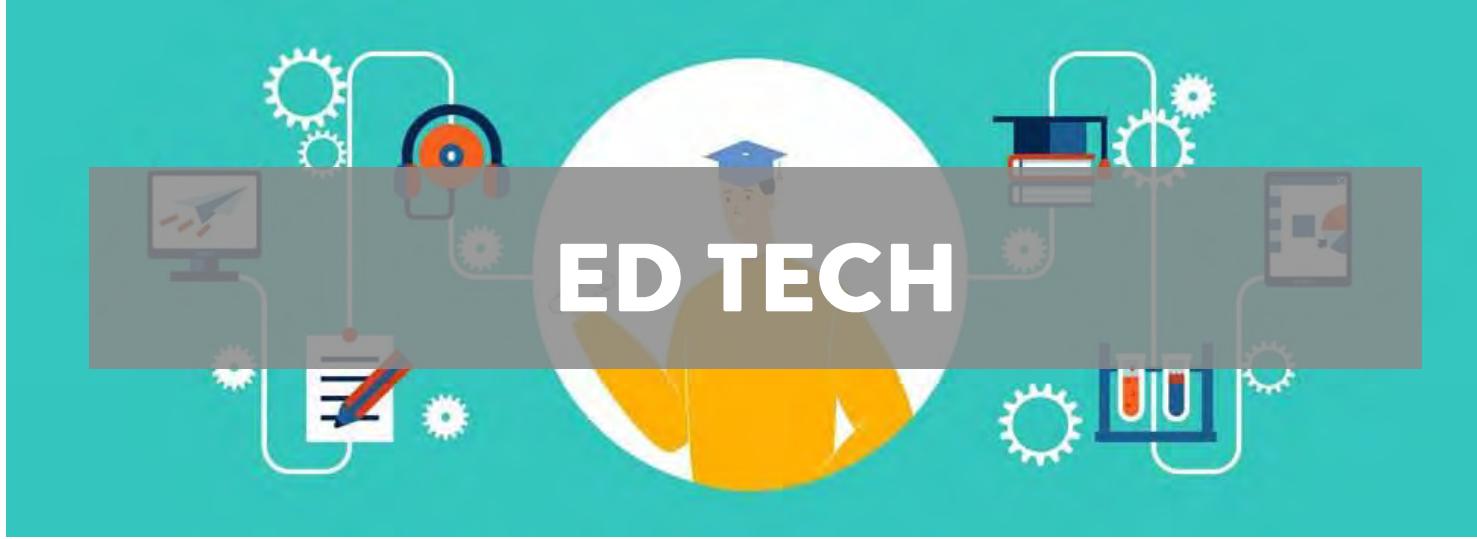
## USER JOURNEY

1. Sign In or Register with necessary details.
2. Land on the home screen with featured services and recommendations.
3. Navigation to Consultation Section:
4. Browse through available services like general health or specialists.

5. Choose the type of consultation needed.
6. View profiles, qualifications, and reviews of available healthcare providers.
7. Select a specific healthcare provider.
8. See the availability of the chosen healthcare provider.
9. Choose a convenient date and time slot for the consultation.
10. Confirm the booking and provide additional details or payment if necessary.
11. Receive confirmation with details of the scheduled consultation.
12. Access the app at the scheduled time for the virtual consultation.
13. Provide feedback and rate the healthcare provider after the consultation.

## USER JOURNEY OF PRACTO





# ED TECH

## WHAT IS EDTECH?

EdTech, short for Educational Technology, refers to the use of technology to enhance and support education. It encompasses a wide range of tools, software, hardware, and educational methodologies that leverage technology to facilitate learning and teaching processes. In the context of online learning, various online platforms are used to deliver educational content and enable virtual teaching.

## TYPES OF ONLINE PLATFORMS

Some commonly used online platforms in the field of EdTech include:

### LEARNING MANAGEMENT SYSTEMS:

A centralized hub for educators to organize and deliver content, manage assessments, and track student progress.

*Eg: Google Classroom*

**VIDEO CONFERENCING TOOLS:** Enable real-time virtual communication between teachers and students. These tools are essential for conducting online classes, virtual meetings, and collaborative discussions.

*Eg: Zoom, Microsoft Teams, and Google Meet*

**ONLINE COURSE PLATFORMS:** Offer a wide range of online courses and educational content created by experts.

*Eg: Coursera, edX, and Khan Academy*

**TEST PREPARATION PLATFORMS:** Offers free test preparation resources for standardized tests like SAT, ACT, and more.

*Eg: Udemy, Career Launcher*

**EXECUTIVE EDUCATION PLATFORMS:** Allows companies to access online courses and specializations to train their employees in various professional skills, degrees, etc.

*Eg: HBS Online, INSEAD Online*

**DISTANCE LEARNING PLATFORMS:** Offers online courses from universities and institutions worldwide, covering a broad range of subjects.

*Eg: edX*

## USER PERSONAS

These platforms are used by people of different ages for a variety of different reasons and goals. These are a few notable ones:

### Elementary School Student:

**Tutitions:** Enhance academic performance through online tutoring for subjects like math and science.

### High School Student:

**Test Practice:** Prepare for college entrance exams (SAT/ACT) to secure admission to a preferred university.

## College Student:

**Skill Upgrade:** Improve coding skills and gain practical knowledge through online courses.

## Senior Learner:

**Digital Literacy:** Acquire basic digital literacy skills to stay connected with family, friends, and access online services.

## Professional:

**Executive Education:** Pursue an executive education program to develop leadership and strategic management skills for career advancement.

## Parent:

**Monitoring Child's Education:** Monitor child's progress in online test preparation courses and provide support when needed.

## Distance Learner:

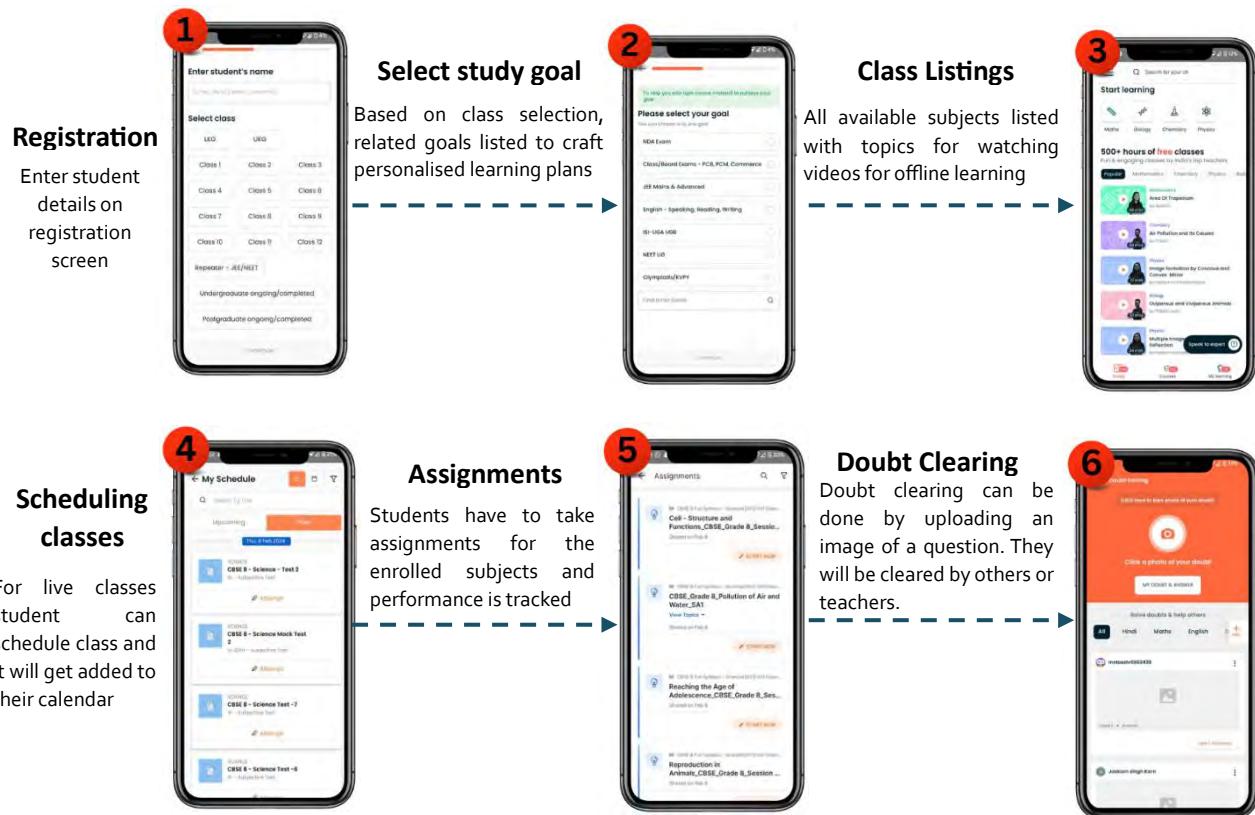
**University Degree:** Pursue a degree through online learning in another state or country.

## USER JOURNEY

Assume this user is a college student who wants to enhance her coding skills through the platform.



## USER JOURNEY OF VEDANTU





## WHAT IS ADTECH

AdTech, short for Advertising Technology, refers to the use of technology to create, manage, and optimize advertising campaigns. It encompasses a wide range of tools, platforms, and software solutions designed to improve the efficiency and effectiveness of digital advertising. AdTech plays a crucial role in the online advertising ecosystem by automating and streamlining various processes, targeting specific audiences, and providing detailed analytics to measure campaign performance.

## RESPONSIBILITIES

**Targeting Specific Audiences:** AdTech professionals are responsible for employing sophisticated targeting strategies, utilizing Data Management Platforms (DMPs) to identify and categorize specific user segments based on demographics, behaviours, and interests.

**Responsive Ad Display:** Ensuring a seamless user experience across various devices and platforms is a key responsibility of AdTech professionals.

**Data Collection on User and Preferences:** AdTech specialists are tasked with implementing robust data collection mechanisms, such as cookies or

pixels, to gather user interaction data and preferences.

**Measurement and Analysis Report:** The generation of insightful reports to evaluate the performance of advertising campaigns by utilizing analytics tools and applying attribution models, they track key performance indicators (KPIs)

**Billing:** AdTech specialists are responsible for developing and implementing transparent billing processes. They ensure accuracy by employing billing systems that track and bill for ad impressions, clicks, or other specified metrics.

## WHO IS AN ADVERTISER AND PUBLISHER

ADVERTISER
The advertiser wants to promote and sell its products or services by reaching a specific audience
Primary goal : run successful advertising campaigns to the target audience and driving maximum engagement and conversions.

PUBLISHER
The publisher is a content creator or media company that produces and manages digital spaces where ads can be displayed
Primary goal : monetize their content by selling a high percentage of their inventory space at the highest price

## BASIC TERMINOLOGIES

**Ad Slot:** A designated space on a webpage or app where an advertisement can be displayed.

**Ad Space:** The physical or digital area within a digital platform where an advertisement is shown.

**Inventory Space:** The total advertising opportunities available for sale on a publisher's platform.

**Impression:** A metric representing each instance an ad is viewed by a user.

**Click:** An interaction with an ad that occurs when a user selects or taps on it.

**Conversion:** The achievement of a desired action by a user, such as making a purchase or filling out a form, after clicking on an ad.

## TYPES OF ADS

**Contextual Ads:** Tailored to match the content of a website, ensuring relevance to the user's interests and the overall theme of the webpage.

**Display Ads:** Often in the form of banner ads, utilize visual content to capture attention and convey promotional messages.

**Native Ads:** Seamlessly blend into the content of a platform, resembling the surrounding material to provide a less intrusive user experience.

## WHAT IS PROGRAMMATIC ADVERTISING

Programmatic advertising is an automated process of buying and selling digital advertising space in real-time auctions.

### Demand-Side Platform (DSP):

Advertisers use DSPs to bid on and purchase ad inventory in real-time.

**Supply-Side Platform (SSP):** Publishers use SSPs to manage and optimize the sale of their ad inventory.

**Ad Exchange:** Acts as intermediary that facilitates the buying and selling of ad inventory by connecting DSPs and SSPs to create a marketplace.

Interaction process when ad is to be displayed:

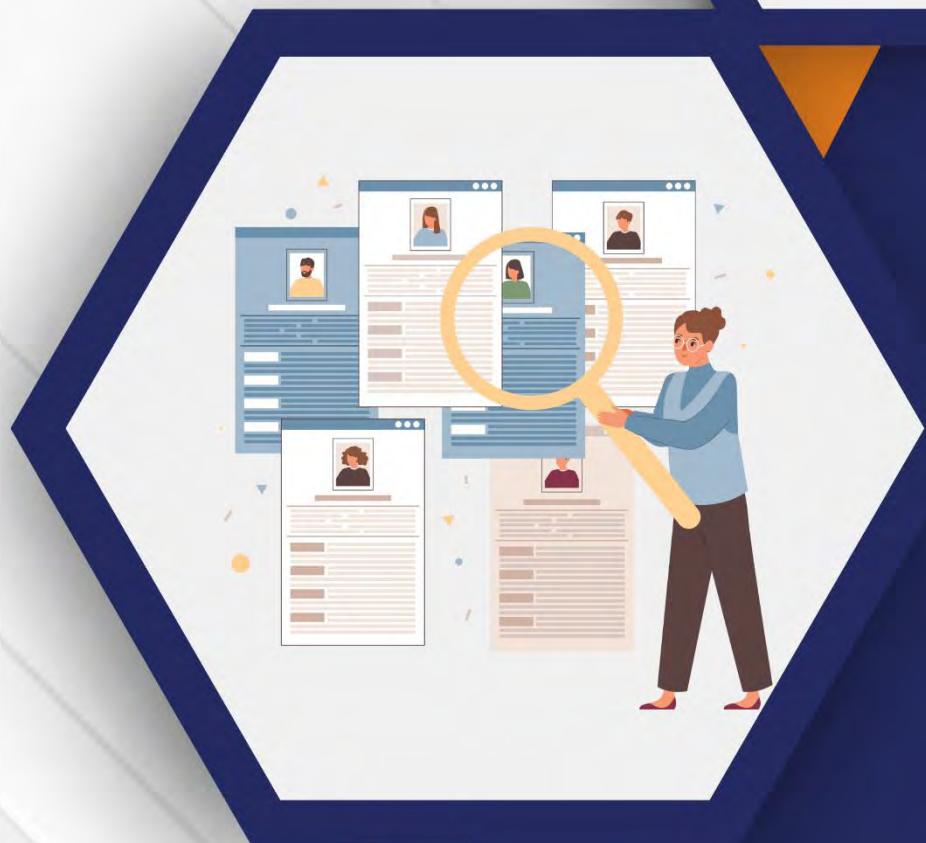
1. When a user visits a website or app, the ad space becomes available for auction.
2. The SSP notifies the ad exchange about the available ad impression.
3. DSPs submit bids in real-time auctions on behalf of advertisers.
4. The winning bid is determined, and the ad exchange communicates this to the SSP.
5. The SSP informs the winning DSP, and the chosen ad is displayed to the user in real-time.

# STRUCTURE OF PM CV

## SECTION 3



BITS SCHOOL  
OF MANAGEMENT



# CV STRUCTURE



## Header Section

**Full Name:** Ensure your name stands out prominently at the top of the document, using a larger font or bold formatting.

**Contact Information:** Include essential contact details:

**Phone Number:** Use a professional and reachable number.

**Email Address:** Provide a professional email address that you actively monitor.

**Location:** City and State (or country if applicable).

**LinkedIn Profile (Optional):** If your LinkedIn profile is up-to-date and professionally relevant, include the URL.

## Professional Summary or Objective

**Purpose:** A brief, compelling introduction summarizing your expertise, accomplishments, and career objectives as a Project Manager.

**Content:** Highlight your relevant skills, years of experience, industry knowledge, and key career achievements.

**Example:** "Dedicated and results-driven Project Manager with over a decade of experience leading complex IT projects for multinational corporations. Skilled in Agile methodologies, stakeholder management,

and delivering projects within strict timelines and budgets."

## Work Experience

**Content:** List your work history in reverse-chronological order (latest experience first).

**Details:** Include job titles, company names, locations, and employment dates (month and year).

**Description:** Outline your key responsibilities, notable achievements, and project outcomes using bullet points.

**Example:** "Senior Project Manager | ABC Company, City, State | Jan 2018 - Present:

Successfully managed a portfolio of projects, leading a cross-functional team of 20 members across different locations, resulting in a 30% increase in project completion rates within the first year."

## Skills and Competencies

**Technical Skills:** List your technical competencies related to project management software (e.g., MS Project, JIRA), methodologies (Agile, Scrum, Waterfall), data analysis tools, etc.

**Soft Skills:** Highlight essential soft skills such as leadership, communication, problem-solving, negotiation, adaptability, and time management.

**Certifications:** Include relevant certifications or accreditations (PMP, PRINCE2, CAPM, etc.) and their respective issuing bodies and dates of certification.

## Education

**Details:** List your educational background in reverse-chronological order.

**Information:** Mention degrees earned, institution names, majors, graduation dates, and any relevant coursework or additional certifications related to project management.

## Professional Certifications and Training

**Certifications:** Highlight any professional certifications or specialized training relevant to project management.

**Details:** Specify the certification name, issuing organization, and the date of completion or certification.

## Professional Achievements and Awards

**Highlights:** Include notable awards, recognitions, or significant achievements in the field of project management.

**Examples:** Mention awards for exceptional project delivery, team leadership, cost-saving initiatives, or successful project completions.

## Professional Affiliations and Memberships

**Affiliations:** Include memberships in professional organizations or associations related to project management (PMI, IPMA, etc.).

**Active Participation:** Highlight your active involvement, contributions, or roles within these organizations, if applicable.

## Languages (Optional)

**Language Skills:** Indicate any additional languages you speak and your proficiency level if relevant to the job or if applying for international roles.

## Interests or Hobbies (Optional)

**Personal Interests:** Briefly mention interests or hobbies that showcase relevant skills (e.g., teamwork in sports, leadership roles in volunteer organizations).

# RESUME GUIDELINES

## Content and Formatting

**Quantify your achievements:** Use numbers and data to showcase the impact of your work. How much did you improve project metrics? How much budget did you save? Use percentages, dollar figures, or specific numbers to make your achievements tangible.

**Focus on action verbs:** Start your bullet points with strong action verbs like "spearheaded," "implemented," "optimized," or "delivered." This makes your CV more dynamic and grabs the reader's attention.

**Use keywords:** Include relevant keywords from the job description throughout your CV. This will help your CV get past applicant tracking systems (ATS) and into the hands of the hiring manager.

**Use a clear and concise format:** Choose a professional font, use clear headings, and maintain consistent spacing. Make sure your CV is easy to read and scan.

**Proofread carefully:** Typos and grammatical errors can make a bad impression. Proofread your CV carefully before submitting it.

## Highlighting Specific Skills

**Technical skills:** Showcase your proficiency in project management methodologies, software tools (e.g., Jira, Asana, Trello), and any relevant technologies.

**Soft skills:** Don't underestimate the importance of soft skills like communication, leadership, problem-solving, and teamwork. Use specific examples to demonstrate how you've used these skills to achieve success.

**Industry knowledge:** If you have experience in a specific industry, highlight it on your CV. This shows that you understand the challenges and opportunities in that field.

## Structure and Formatting

**Keep it concise and clear:** Aim for 1-2 pages maximum. Recruiters spend mere seconds scanning each CV, so make sure yours is easy to read and understand.

**Use a professional format:** Choose a clean and readable font, consistent spacing, and clear headings. Avoid using fancy fonts or colours that might distract from the content.

## Highlight Achievements through the STAR Method

**Situation:** Briefly set the context. What problem were you facing or opportunity did you identify?

**Task:** Explain your role and responsibilities in the situation.

**Action:** Describe the specific actions you took to address the situation. Use strong action verbs like "led," "developed," "implemented," or "streamlined."

**Result:** Quantify the impact of your actions. Use metrics, data, and percentages to showcase the positive outcomes you achieved.

## Showcase Leadership and Impact

Go beyond individual contributions and emphasize how you led cross-functional teams, influenced strategic decisions, and drove significant change.

Quantify your leadership impact. Did you increase team productivity? Improve communication or collaboration? Quantify these contributions.

## Connect to Business Acumen

Use business terminology that demonstrates your understanding of key concepts like market analysis, competitive landscapes, financial performance, and ROI.

Show how your actions contributed to broader business goals like revenue growth, cost reduction, or market share expansion.

## Quantify Achievements

Whenever possible, include quantifiable metrics or numbers to illustrate the impact of your work. For example:

*"Increased product revenue by 30% within six months."*

*"Launched three successful products resulting in a 20% market share growth."*

*"Reduced time-to-market by implementing efficient processes, resulting in a 25% faster product delivery."*

## Examples

### Highlighting Achievements:

*Led UX overhaul, boosting mobile app retention by 30% and engagement by 25%.*

*Pioneered new subscription model, surpassing revenue targets by 15% in first year.*

*Streamlined procurement process, slashing production costs by 10% and boosting profitability.*

### Showcasing Leadership:

*Mentored junior PMs, resulting in 20% productivity increase and improved team morale.*

*Championed Agile adoption, accelerating development by 40% and enhancing product quality.*

*Negotiated key vendor contracts, securing 15% cost reduction, and securing vital materials.*

### Connecting to Business Acumen:

*Analysed competitor landscape, identifying strategic opportunity for market share expansion.*

# CERTIFICATIONS



## Foundational

Certified Product Manager (CPM) by the Product Management Institute (PMI)

Certified Agile Product Owner (CAPO) by the Scrum Alliance

Product School Graduation Certificate

## Advanced

Certified ScrumMaster (CSM) by the Scrum Alliance

Scaled Agile Framework (SAFe) 5 Agilist certification

Google Analytics Individual Qualification (IQ)

## Tech

Google Cloud Professional Certifications (e.g., Architect, Security Engineer)

AWS Certified Solutions Architect - Associate

Microsoft Azure Certifications

## Additional Certifications

Lean Product & Agile certifications for iterative development methodologies

Design Thinking certifications for user-centric product development

## Data Analysis

Programming languages: Python, SQL, R

Data visualization tools: Tableau, Power BI, QlikView

Statistical analysis: Hypothesis testing, regression analysis, A/B testing

Data mining and modelling: Machine learning basics, predictive analytics

## Project Management

Agile methodologies: Scrum, Kanban, Lean

Project management tools: Asana, Trello, Jira, Microsoft Project

Product roadmaps: Prioritization & resource allocation

## Design & Prototyping

Wireframing and prototyping tools: Figma, Sketch, Adobe XD

User interface (UI) and user experience (UX) principles: Design thinking, accessibility, usability testing

Basic graphic design tools: Photoshop, Illustrator

# IMPORTANT FRAMEWORKS

## SECTION 4



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# FRAMEWORKS - INTRO

## Why do we need frameworks?

Structured ways of tackling complicated challenges, making informed decisions, and driving successful outcomes are all made attainable via the use of frameworks, these serve as important tools in the ever-changing business environment of product management.

This enables them to navigate through uncertainty, identify critical challenges, and design strategic solutions, which provide a systematic manner to assess, organise, and prioritise information. When it comes to identifying consumer demands, analysing market prospects, or optimising product development processes, frameworks offer a common vocabulary and approach that enables product teams to successfully cooperate with one another and coordinate their efforts towards the achievement of business objectives.

## Types of Frameworks

**Prioritisation Frameworks:** Product managers usually have a plethora of tasks to deal, they rely heavily on prioritisation frameworks to help them decide which features, activities, or projects to concentrate on. These frameworks balance conflicting goals and maximise the value provided to users and the company.

**Product Development Framework:** An everyday Framework! Product development frameworks guide teams through the ideation, prototyping, testing, and iteration phases of the process, promoting creativity and effectiveness in product development cycles.

**Data Framework:** The backbone of every enterprise, Data. It's important for a product manager to understand the data that goes behind the entire product. These frameworks help gather, analyse, and understand data to guide the creation of new products and achieve organisational goals.

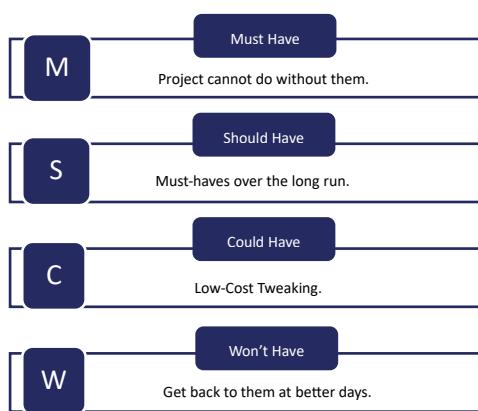
**Design Thinking Frameworks:** One of the most crucial yet underrated phases of the product lifecycle are the design thinking process. To incorporate this, certain frameworks help establish a human-centred method for generating original ideas and resolving issues.

**User Journey Framework:** Customer is king! These frameworks outline the customer's journey, pointing out important points of contact and areas that should be improved. Centred on comprehending human behaviour, preferences, and pain points, make it easier to create user-centric products by utilising methods like personas, journey mapping, and usability testing.

# PRIORITIZATION FRAMEWORKS



## Moscow Method

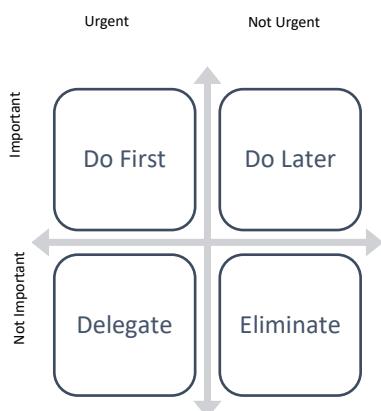


Categorize tasks as Must-have, Should Have, Could-have, and Won't have.

**Formula:** Assign M=100, S=50, C=25 and W=0 to each task. Calculate the total score for prioritization.

**Example:** While building a budgeting app, “Security” would be a Must-have, “Social Media Integration” a should-have, “Dark Mode” a could-have, and “Gaming Feature” a Won’t-have.

## Eisenhower Matrix



Prioritize tasks based on urgency and importance.

**Formula:** Rank tasks as High/Low in Urgency and Importance, then tackle high-high tasks.

**Example:** Urgent and Important tasks include “Critical Bug Fixes”, while important but not urgent tasks could be “User Research”.

## Buy-a-feature



Source: *ThirdRock Techkno* [Link](#)

Let Stakeholders “Buy” features with limited resources.

**Formula:** Features with highest “purchase” gets prioritised.

**Example:** Shareholders allocate 100 points to buy features, and the most “bought” features make it to the development roadmap.

## RICE Scoring Model



**Reach:** How many people will this feature affect within the given period?

**Impact:** How much will this impact individual users? Confidence, How confident are we about the impact and reach scores?

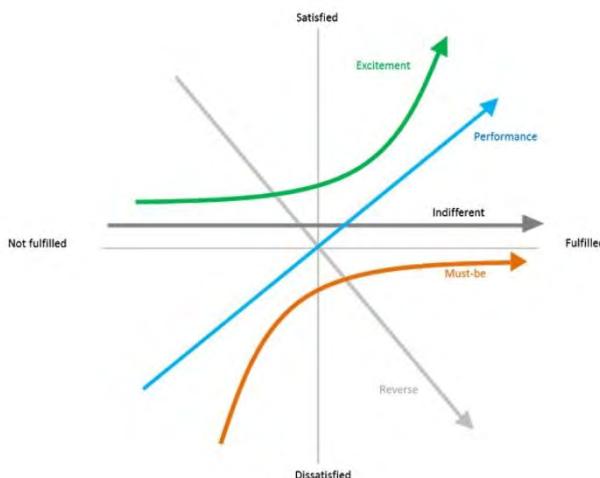
**Effort:** How much of a time investment will this initiative require from product, design and development?

**Formula:**

$$\text{Score} = (\text{Reach} \times \text{Impact} \times \text{Confidence}) / \text{Effort}$$

**Example:** A feature with a Reach of 4, Impact of 5, Confidence of 3 and an effort of 6. The score will come out to be 10.

## Kano Model



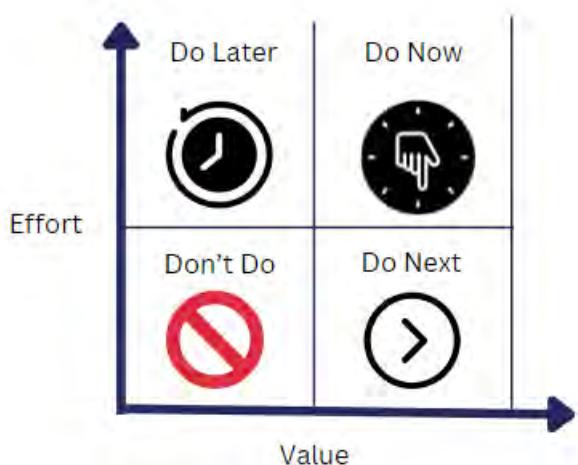
Source: Artstrategies [Link](#)

Classify features into **Must-be**, **Performance** and **Excitement** categories.

**Formula:** Customer Satisfaction varies based on feature types.

**Example:** Users expect a “Functional Search” (Basic), appreciate “Faster Processing” (Performance), and get excited about “Augmented Reality” (Excitement).

## WSJF (Weighted Shortest Job First)

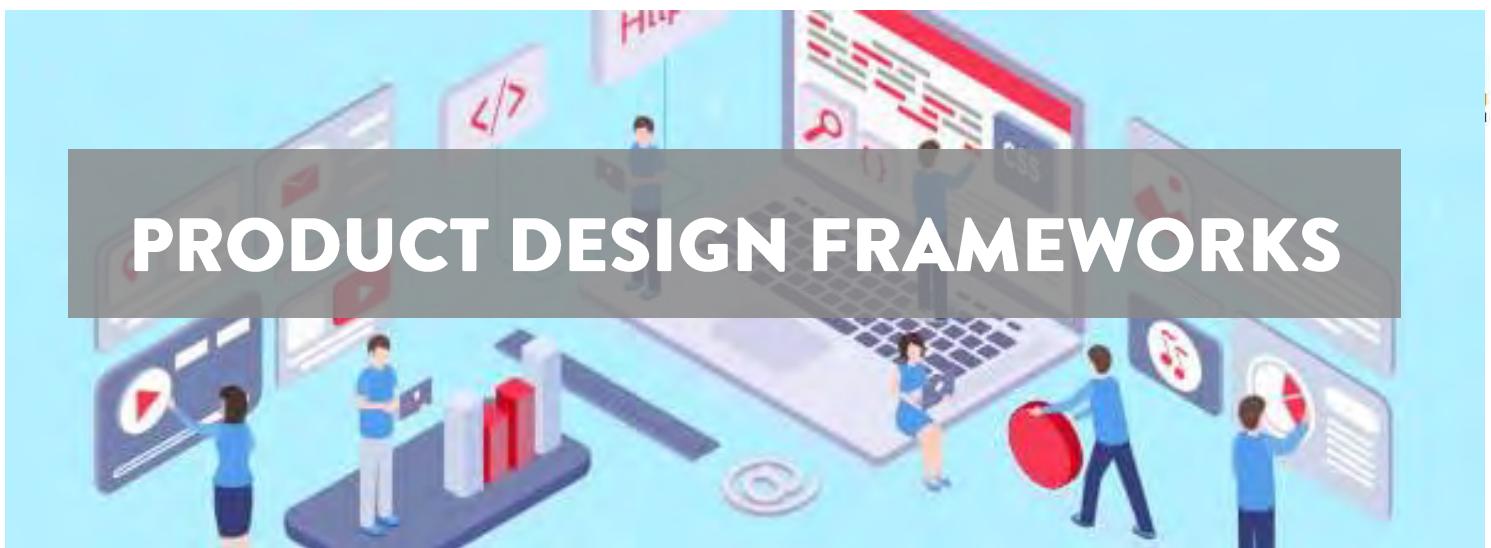


Prioritize tasks by considering cost of delay and Job Size.

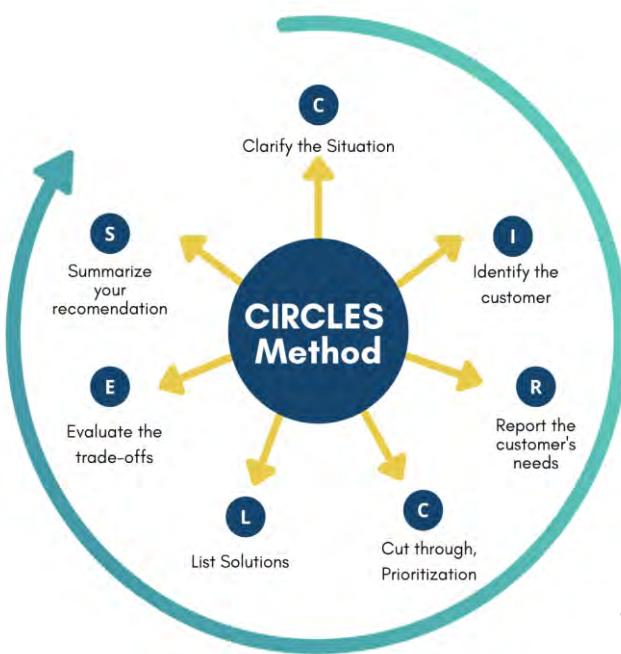
**Formula:**  $\text{WSJF} = \text{CoD} / \text{Job Size}$

**Example:** A project with a cost of delay of \$20,000 and a job size of 40 points would have a WSJF score of 500 ( $20,000/40$ ).

# PRODUCT DESIGN FRAMEWORKS



## CIRCLES Method



Source: Pranjal Shukla, Bootcamp [Link](#)

**C** - Clarify and try to frame the problem by getting more information on the main problem statement. Some follow-up questions would be: Why do we want to this? What's the reason we decided to do this now?

**I** - Identify your end user and their environment or their context to the problem statement.

**R** - Report end user pain points / needs so that you get a list of all potential problems you'd need to solution via technology.

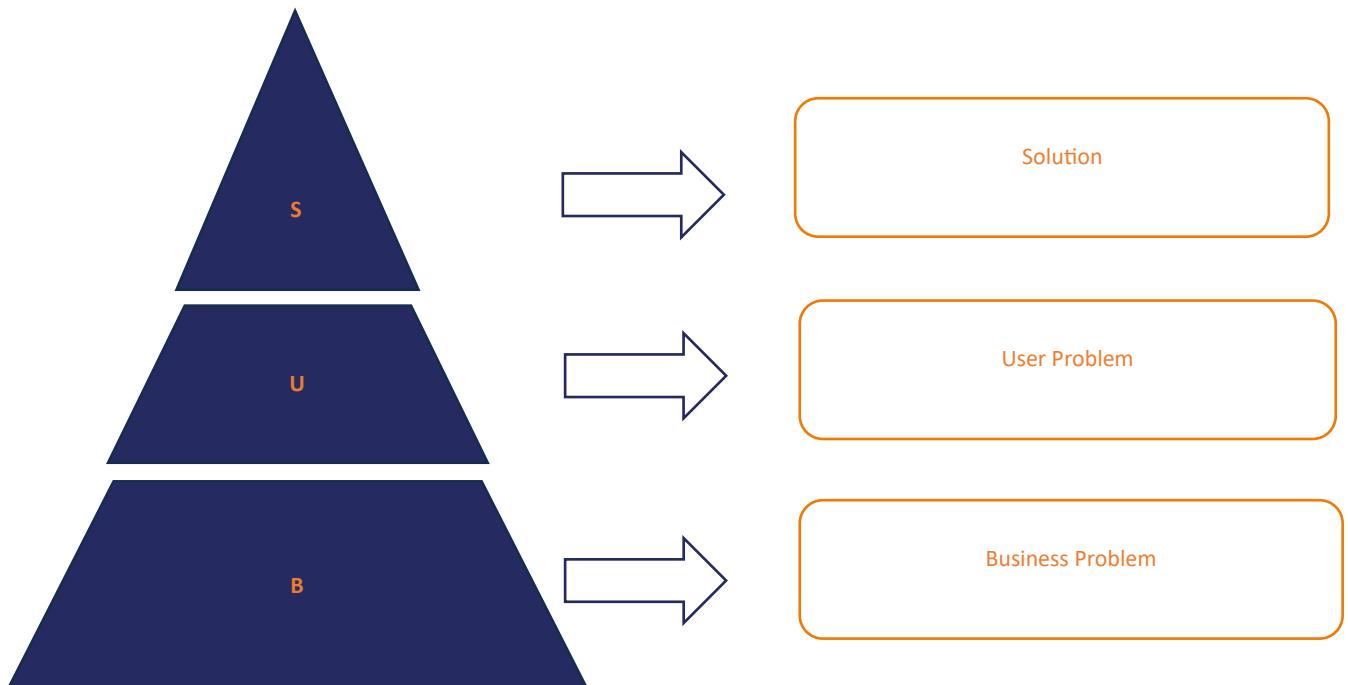
**C** - Cut through the list of pain points i.e. to prioritise what you want to solve first basis impact, and how big certain pain points are over others.

**L** - List all solutions connecting to the pain points you listed in the previous step.

**E** - Evaluate the pros and cons of each solution to pick the right one.

**S** - Summarise your recommendation so that the Interviewer is clear on your approach and suggestions clearly.

## BUS Method



**Business Problem** - This stage focuses on understanding the why behind the product.

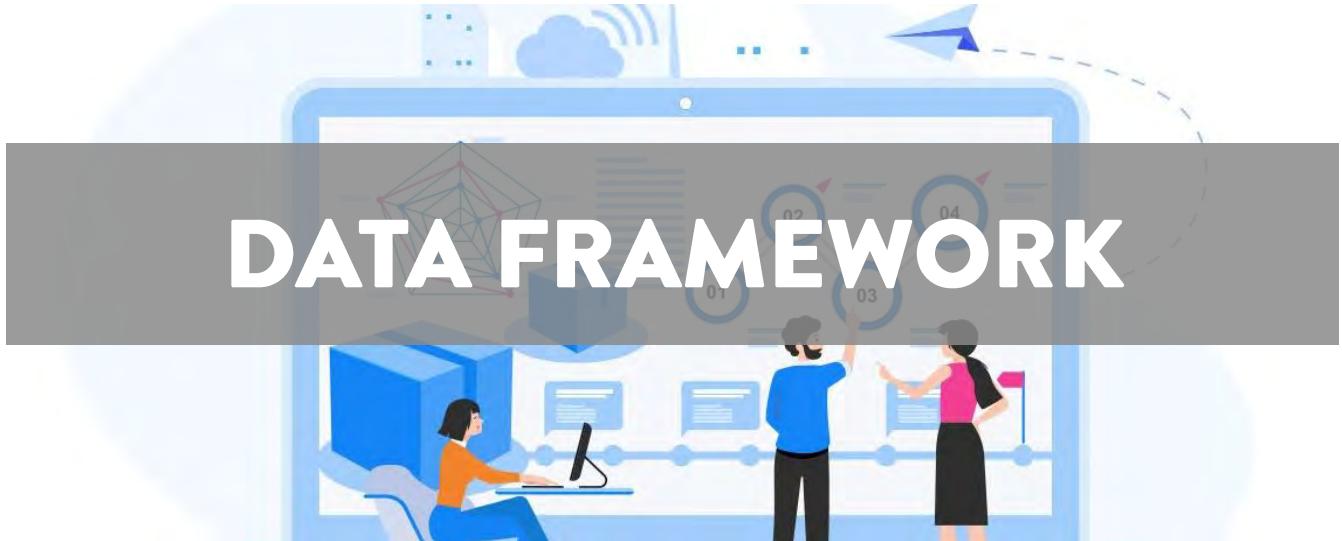
**Example:** What are the overall business goals this product aims to achieve? What problem are we trying to solve for the company? How will success be measured?

**User Problem**- This stage shifts the focus to the who and what. It delves into understanding the users' needs and pain points.

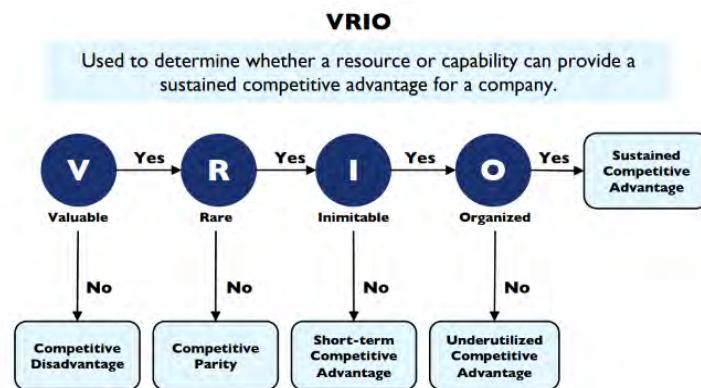
**Example:** Who are the target users for this product? What are their specific problems and unmet needs? How will our product improve their lives or solve their problems?

**Solution-** This stage brings the first two stages together to develop the how. It involves brainstorming and validating potential solutions.

**Example:** What features and functionalities will address the user problems and achieve the business goals? How can we ensure the solution is feasible and desirable for both the users and the business? What are the different options for implementing the solution, and which one is the most effective?



## VRIO Framework



Source: PM School [Link](#)

**Value (V)** - Resources must add value to the product or service. They should contribute to the firm's ability to exploit opportunities or defend against threats in the market.

**Example:** A cutting-edge technology used in a smartphone that offers unique features, enhancing the overall user experience.

**Rarity (R)** - Resources should be rare or unique. If a resource is widely available, it is less likely to provide a sustainable competitive advantage.

**Example:** Exclusive access to a rare and specialized talent pool in data analytics, giving a company a competitive edge in deriving insights from complex datasets.

**Imitability (I)** - Resources should be difficult to imitate or replicate by competitors. This involves factors like legal protection, unique processes, or complex know-how.

**Example:** A patented manufacturing process that allows a company to produce a product more efficiently, making it challenging for competitors to replicate.

**Organization (O)** - The firm must be organized to exploit the resource effectively. This involves having the right processes and culture to leverage the resource for competitive advantage.

**Example:** A well-established and agile project management system that allows a company to rapidly adapt to market changes and implement innovative ideas.

# DESIGN THINKING FRAMEWORK



Source: PM School [Link](#)

**Empathize:** This stage is about understanding the needs and challenges of your target users. You can do this through user research, such as interviews, surveys, and observations.

**Example:** You might interview and observe people who use similar apps to understand their pain points and needs.

**Define:** Based on your empathy research, you define the core problem or opportunity you will be addressing. This problem statement should be clear, concise, and user centred.

**Example:** You might define the problem as "People find it difficult to stay organized and on top of their tasks."

**Ideate:** You might come up with ideas for a new app that uses gamification, artificial intelligence, or personalized to-do lists to help people stay organized.

**Example:** You might come up with ideas for a new chair that is adjustable, made from sustainable materials, or has built-in features like massage or heat.

**Prototype:** You might create a paper prototype of your app to test the basic functionality with users.

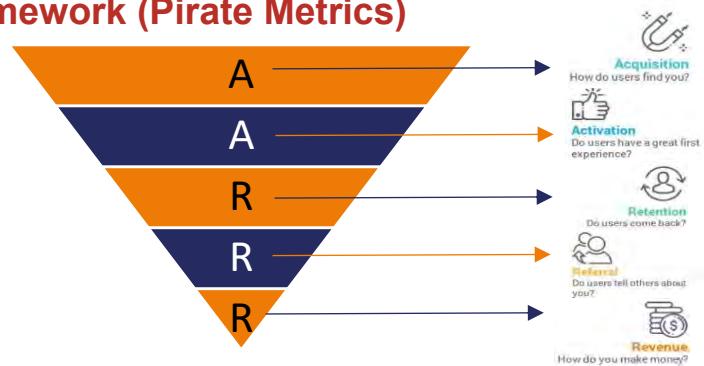
**Example:** You might create a rough model of your chair out of cardboard or foam to test the basic ergonomics with users.

**Test:** You might give your prototype to a small group of users to try out and get feedback on what works and what doesn't.

**Example:** You might ask a group of people to sit in your prototype chair and give you feedback on its comfort, style, and functionality.



## The AARRR Framework (Pirate Metrics)



**Acquisition:** This is the phase where customers first discover and visit your product.

**Example:** Users download the social media app from the app store, sign up, and start exploring the platform.

**Activation:** Refers to the point where users have their first positive experience with your product. It could be the completion of a key action or the use of a core feature.

**Example:** The user completes their profile, follows a few friends, and posts their first status update or photo.

**Retention:** The goal is to keep users engaged and encourage them to continue using the product over time.

**Example:** The app utilizes notifications and personalized content to keep users engaged, prompting them to visit the platform regularly.

**Revenue:** This stage focuses on how the product generates revenue. It could involve one-time purchases, subscription fees, or any other monetization strategy.

**Example:** The social media platform may generate revenue through targeted advertising based on user preferences and behaviour.

**Referral:** Customers become advocates and refer others to your product, helping in organic growth.

**Example:** The app encourages users to invite friends to join by offering incentives or creating features that promote sharing, such as tagging friends or sharing posts.

# KEY METRICS

## SECTION 5



# METRICS - INTRO



## What are Metrics?

Metrics are quantifiable values that help businesses measure and track the performance of a product or an activity. However, not every metric can tell you how successful your product is, and some metrics are irrelevant or misleading. You need to choose the right metrics based on your business goals and your industry.

You should also be able to define and use the metrics in a way that shows the health and impact of your product or feature. Metrics are often asked in interviews. For example, an interviewer might ask you, "How would you measure the success of the new edit feature on Instagram?"

To answer such questions, you need to know how to deal with metric changes. Metric changes are when a key product metric (such as traffic, revenue, engagement, etc.) fluctuates unexpectedly. The interviewer wants to see how you approach the problem and find the root cause behind the issue. A common mistake candidates make is to give an unstructured answer. To avoid this, you need to understand the metrics well.

## KPI (Key Performance Indicators)



A set of metrics that are aligned with your key business goals is called a Key Performance Indicator (KPI). A KPI is a quantifiable indicator of how well your product or business is performing over time. KPIs are used for strategic decision-making. KPIs are different from metrics in that they are specifically designed to communicate your progress towards your goals, while metrics are more general and can be used to monitor various aspects or processes of your product or business.

Here are some reasons why you need KPIs:

1. To monitor your company's health and success.
2. To analyse trends and patterns over time in the industry.
3. To solve problems and seize opportunities.
4. To compare against your current performance.
5. To boost employee morale.

# IMPORTANT METRICS

## Customer Acquisition Cost (CAC)

CAC represents the expenditure incurred to acquire a new customer. This metric is determined by dividing the total sales and marketing expenses by the number of customers acquired within a specific period.

CAC helps you understand if your current strategy is sustainable and profitable when acquiring new customers.

A high CAC is only justified if the customer lifetime value (CLV) is also high. If you are spending a lot of money on marketing for customers that have a low CLV, you need to find other ways to attract new users.



Source: Gautam Sachdeva [Link](#)

## Top 7 ways to improve customer retention rate



Source: Survey Sensum [Link](#)

## Customer Retention Rate (CRR)

It means how well you keep your existing customers from leaving your product by calculating the percentage of customers who remain at the end of the given period.

A low CRR means that your product is not delivering what it promises or meeting the customer's needs.

A high CRR means that you have loyal and satisfied customers who generate recurring revenue and provide opportunities for upselling and cross-selling.

## Feature-Usage Metric

$$\text{Feature Usage} = \frac{\text{Number of unique users of a feature}}{\text{Total number of unique users}} \times 100$$

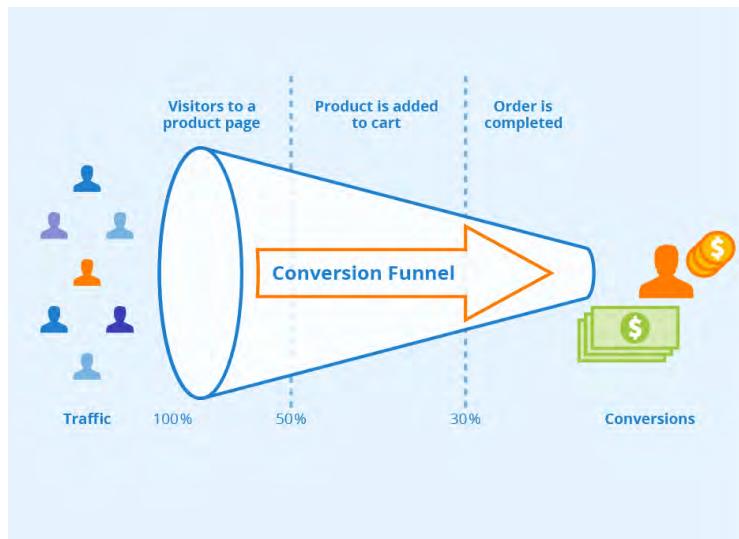
Feature usage is a type of engagement metric that shows how users interact with a specific feature of a product, rather than the whole product.

It tracks the frequency and the mode of use of a certain feature by the users.

This metric will help you learn about user behaviour and how you can meet user needs better.

Conversion can have different meanings depending on your goal, for example, the number of users who contacted you or booked a demo after visiting your website would also be a conversion.

## Customer Conversion Rate



Source: Seobility [Link](#)

Conversion rate is a key metric that quantifies the percentage of users who successfully complete a desired action out of the total number of users engaging with your product or service.

Conversion rate can be calculated as:

**Conversion Rate**=Total number of new users / Number of new users who made a payment

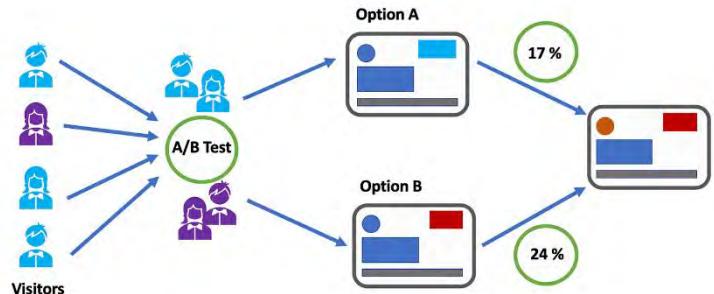
A low Customer Conversion Rate indicates that your app/ website or your features are not meeting your visitor's expectations or needs.

To improve your Customer Conversion Rate, you need to identify and fix the issues that are causing your visitors to drop off or not use your features.

## A/B Testing

A/B testing is a method of comparing the effectiveness of two alternatives or variations of something. It is used to find out which option works better.

This metric lets you test different versions of a new feature, design, or other product element by showing them to a random sample of your users and measuring which one they like more.



## Monthly / Annual Recurring Revenue (M/ARR)

These numbers show the amount of revenue that you can expect to receive every month and every year from your customers.

This metric helps you monitor your company's financial performance and growth.

## Customer Feedback Analysis

Customer Interviews are a powerful way to connect with customers, understand their needs, and discover what they want.

Customer Interviews can help us learn about their experience with a particular feature or the whole product.

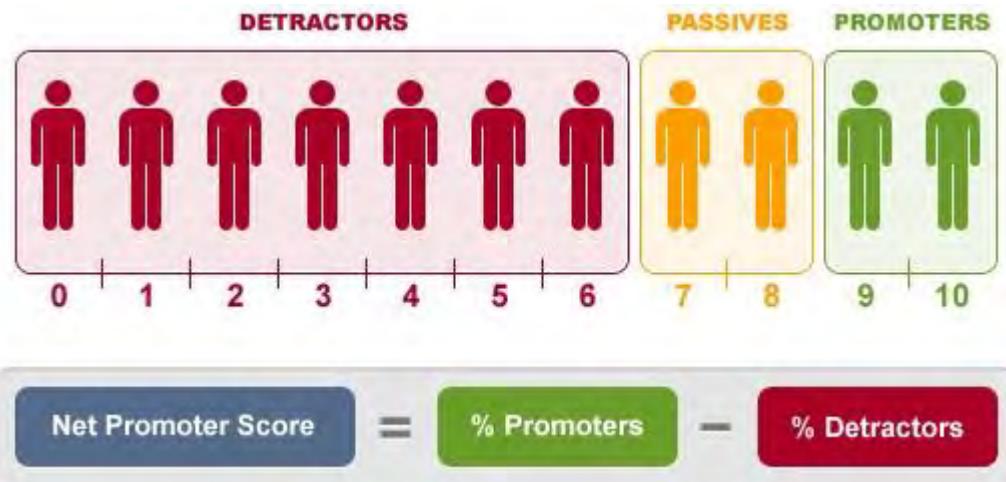
The key is to ask open-ended questions that begin with who, what, when, where, why, or how. This will prompt people to share more insights and details.

Interviews are a great way to collect direct feedback from users on product's usability, value, and potential for growth.

$$\text{Total # of active customers} \times \text{Average billed amount} = \text{MRR}$$



## Net Promoter Score (NPS)



Source: CheckMarket [Link](#)

## Net Promoter Score (NPS)

NPS is a metric that many companies use to measure how satisfied their customers are with their products.

The principal NPS question is, *“How likely are you to recommend this product or service to a friend or colleague?”*

NPS is calculated as the difference between the percentage of promoters and the percentage of detractors.

NPS is expressed as a number between -100 and 100. For example, if you have 30% detractors and 45% promoters, your NPS is 15.

An NPS score of more than 0 is considered a “desirable” NPS score.

### How to calculate NPS:

Conduct a survey of your existing customers, asking them to rate your product on a scale of 1 to 10.

Divide them into **3 groups**, based on their ratings.

1. **Detractors:** Customers who give a rating of 1 to 6. They are unhappy or dissatisfied with your product and may spread negative word-of-mouth.
2. **Passives:** Customers who give a rating of 7 or 8. They are neutral or indifferent about your product and may switch to a competitor if they find a better offer.
3. **Promoters:** Customers who give a rating of 9 or 10. They are loyal and enthusiastic about your product and may refer others to use it.

Calculate the NPS score by subtracting the **% of Promoters** by the **% of detractors**.

# PRODUCT TEARDOWNS

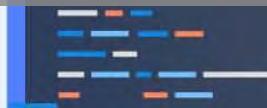
## SECTION 6



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# PRODUCT TEARDOWNS - INTRO



A product teardown involves a comprehensive examination and reverse engineering of a product's design, functionality, and user experience. This process entails dissecting various aspects of the product to uncover valuable insights into its strengths, weaknesses, and potential areas for enhancement. For a Product Manager, it is essential to introspect and comprehend the rationale behind the product's design – understanding its objectives and identifying existing drawbacks. Product teardowns should not be confined to competitive applications alone but should extend to include products from diverse domains.

## Reasons to perform Product Teardowns

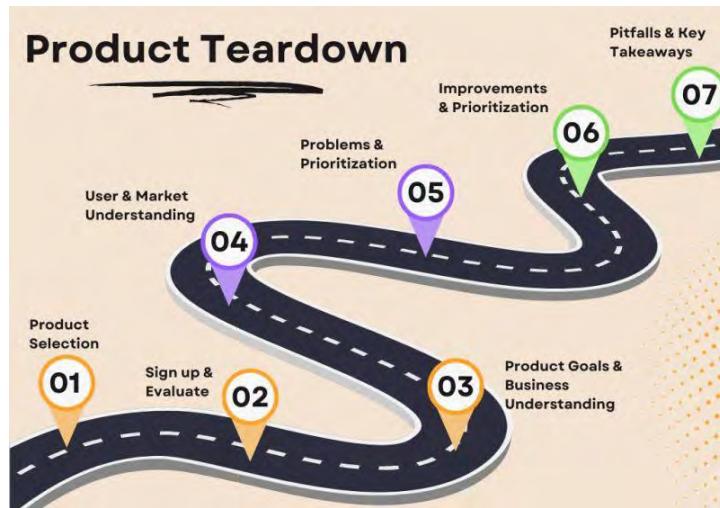
**Deep dive into the nuances of UX:** Gaining profound insights into a product involves a thorough examination of its various interactions, UX flows, notification systems, communication channels, and how it handles exceptions. Additionally, staying informed about the latest design trends observed in popular apps can provide valuable parallels for one's own product, facilitating quick recognition and identification by customers.



**Competitive Study:** Product teardowns can be considered an ideal framework for comprehending competitors. This concept aids in grasping their offerings and their approach to addressing the same problem statement encountered by your product. Analysing user reviews, complaints and inputs provide insights into the pain points experienced by their customers, offering valuable information about their most acclaimed features.

**Innovation:** During Product Teardowns, you may encounter unique solutions or architectures that enhance the onboarding and engagement experience for both new and repeat users. Embrace the opportunity to learn from and integrate such innovative ideas into your own product, paving the way for out-of-the-box solutions that cater to customer needs.

## Steps for Product Teardowns:



**Product Selection:** The first step in performing a digital product teardown involves the thoughtful selection of a product for analysis. Irrespective of the domain it belongs to, choosing a successful product with a significant user base is essential, as it yields the most insightful findings.

**Evaluating the Personas and their User Experience:** It is imperative to identify the user personas as a crucial step. Subsequently, evaluating the user experience becomes a critical component of the teardown process. Examine the design, user flow, and overall usability of the product. Scrutinize the onboarding process, pinpointing any notable strengths or weaknesses in features and functionality.

**In Depth Research:** To gain a deeper comprehension of the product's performance, conducting a thorough research is essential. Activities like exploring the company's website, social media presence, user reviews, and any media coverage might come handy. Analyse the product's marketing strategy and its position within the market.

**Scope of Improvements:** Post understanding and analysing, it is vital to identify areas for improvement. Assess the product's potential areas of improvements. All of these found problems are not important. Pick the problems that are most critical for the users and also align with the goals of the teardown.

**Brainstorm and prioritize:** Once the problems have been identified, the next step is to brainstorm and come up with innovative solutions. This is the phase which requires pushing the creative boundaries and thinking out of the box. A list of solutions must be proposed and then the most sensible one must be prioritized, based on impact and effort required.

**Summarize:** Prepare a comprehensive report summarizing the findings, recommendations, and proposed action plan. Communicate the benefits and rationale.



## About the Company

Established in 2021, Zepto is a Mumbai-based instant grocery delivery service that prioritizes swift and efficient delivery, promising to bring groceries to customers within 10 minutes. Utilizing a network of dark stores and micro-warehouses, the company emphasizes speed, reliability, and efficiency as its key selling points, steering away from traditional methods of attracting customers through discounts or offers.

### Problem Statement:

Evaluate the “building the cart before purchase” flow of Zepto app and redesign the experience while identifying opportunities to make usability better for the users age above 35 years which will lead to increase in average order value and retention.

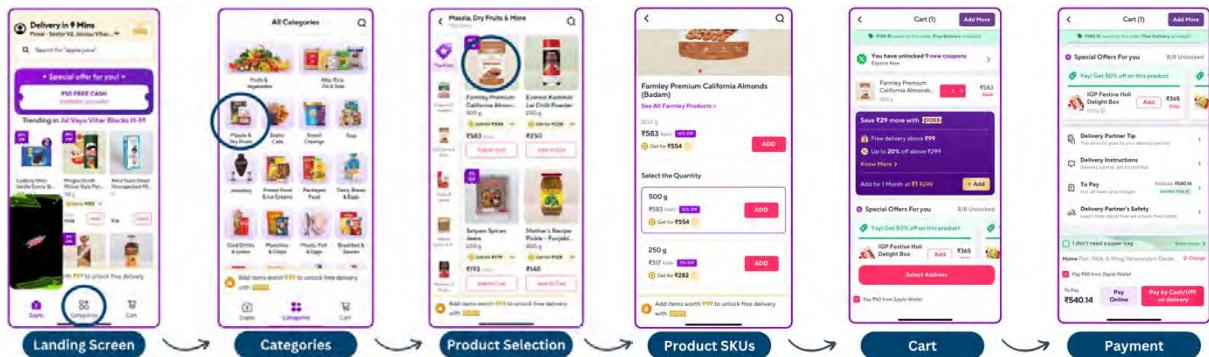
### Probable outcomes of solution

- Helps users to maximize each order ensuring they have a seamless experience which eventually makes them loyal customers.
- Upon solving this problem, we can decrease the bounce rate.
- A seamless experience and an improved flow for users helps to make more orders.
- It will increase the average order value and as the good experience will increase the customer retention rate.

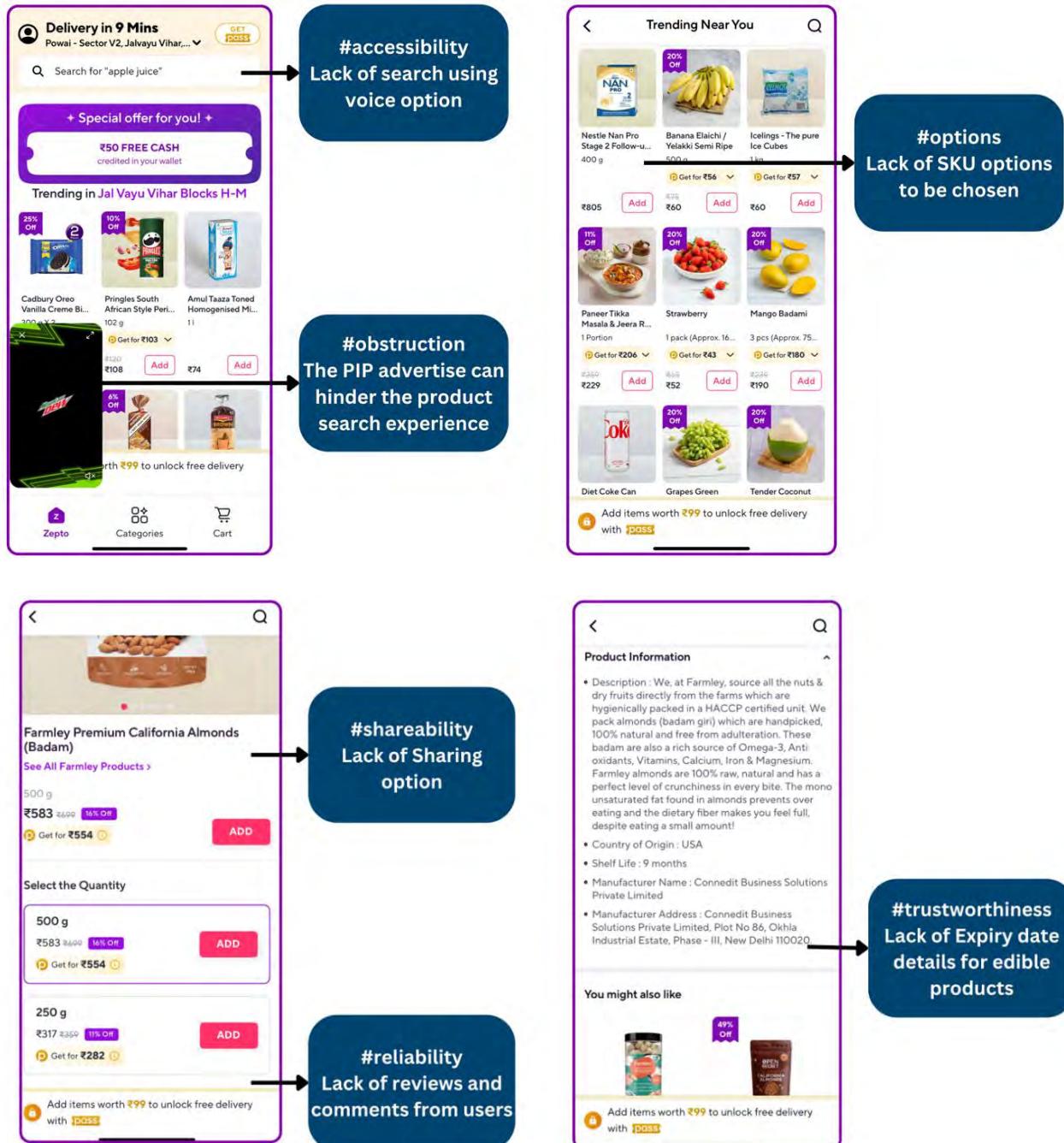
### User Persona

<b>Lakshmi</b>  "I regularly use apps to order my daily grocery needs"  Age : 35 Years Gender : Female Role: Team Lead Location : Bangalore  Persona Summary Lakshmi is a Team Lead in a tech company and fitness freak from Bangalore. She likes to eat fresh Vegetables and Fruits on daily basis, but due to work from home, she doesn't get ample time for grocery shopping. She has been using zepto to order daily needs as the delivery is super fast. She has a pet dog and usually orders pet supplies along with other groceries.	<b>Pain Points</b> <ul style="list-style-type: none"><li>• Products unavailability all the time</li><li>• Category section is not well organized</li><li>• Products quality and quantity variations</li><li>• Filtering option for products is not precise</li></ul> <b>Expectations</b> <ul style="list-style-type: none"><li>• Provide an option to the user to place an order when the product is not available</li><li>• Create new filtering and itemization features</li><li>• Standardize the quality/quantity for the products across zepto</li></ul>
Other Brands: 	

## User Journey



## Identified Flaws



**#accessibility Lack of search using voice option**

**#obstruction The PIP advertise can hinder the product search experience**

**#shareability Lack of Sharing option**

**#reliability Lack of reviews and comments from users**

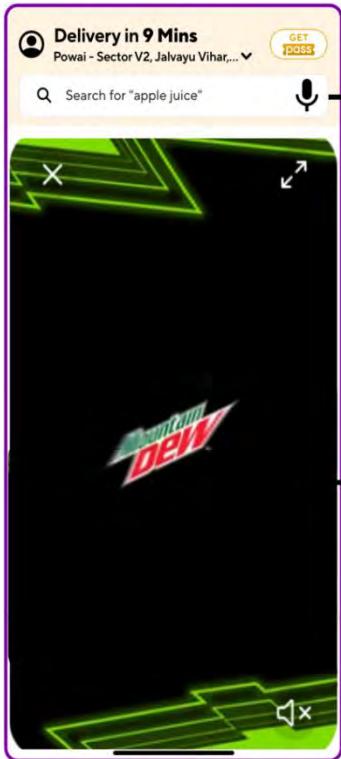
**#options Lack of SKU options to be chosen**

**#trustworthiness Lack of Expiry date details for edible products**

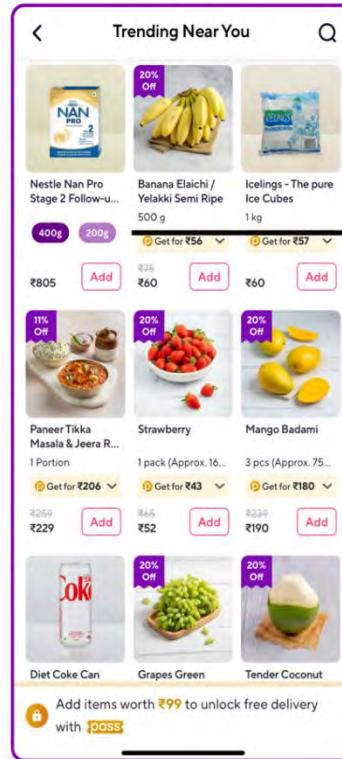
Detailed description of the flaws:

- #accessibility Lack of search using voice option:** A callout points to the search bar at the top of the screen, which lacks a microphone icon for voice search.
- #obstruction The PIP advertise can hinder the product search experience:** A callout points to a large, semi-transparent advertisement for Mountain Dew that obscures the product search results.
- #shareability Lack of Sharing option:** A callout points to the product detail page for Farmley Premium California Almonds, where there is no visible sharing icon.
- #reliability Lack of reviews and comments from users:** A callout points to the same product detail page, highlighting the absence of user reviews.
- #options Lack of SKU options to be chosen:** A callout points to the "Trending Near You" section, which displays multiple product cards with different sizes and prices (e.g., 400g, 500g, 1kg) but no explicit "Add" buttons for each.
- #trustworthiness Lack of Expiry date details for edible products:** A callout points to the "Product Information" section of the Farmley Premium California Almonds page, which fails to provide any information about the product's expiration date.

## Potential Solutions

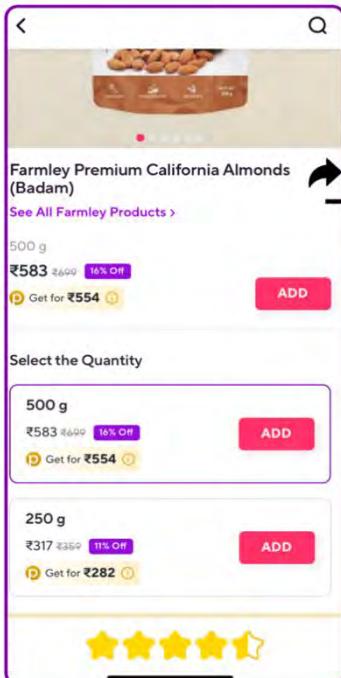


Adding a search by voice input feature



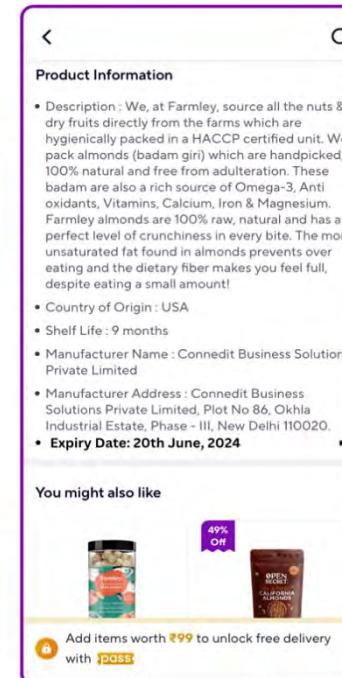
Adding more SKU options right at the product brief details

Display the ad completely. The close icon will get more visibility.

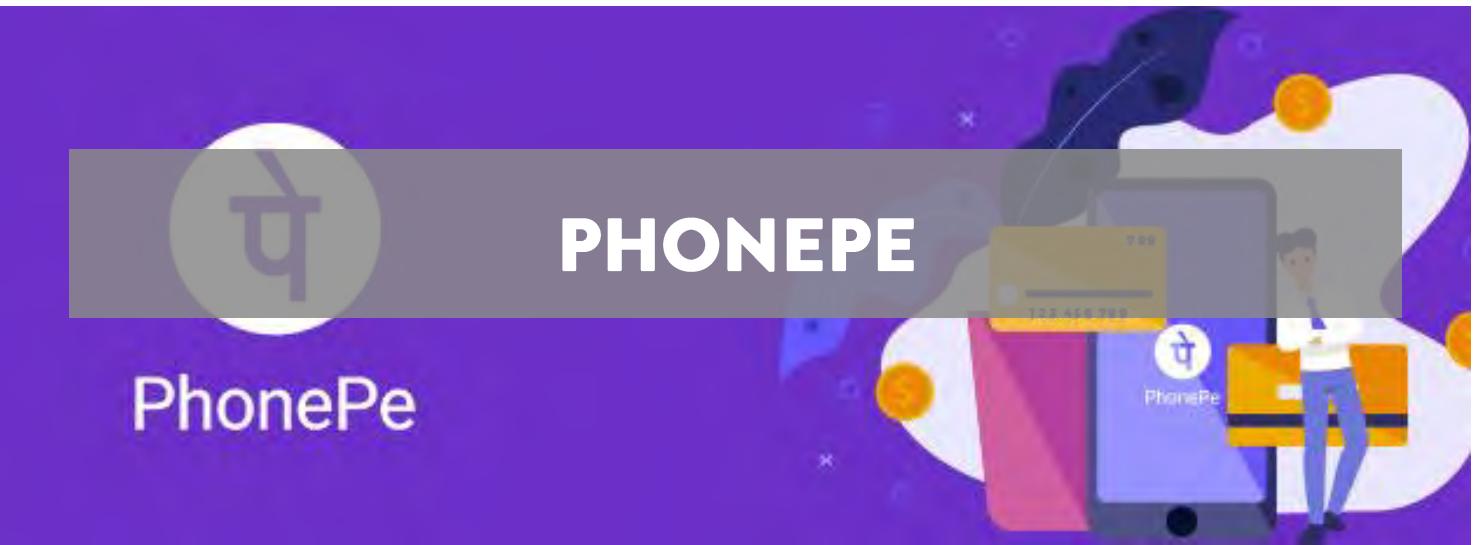


Adding a share button will allow users to share the product with others

Adding review feature will help users take informed decisions before buying



Adding more SKU options right at the product brief details



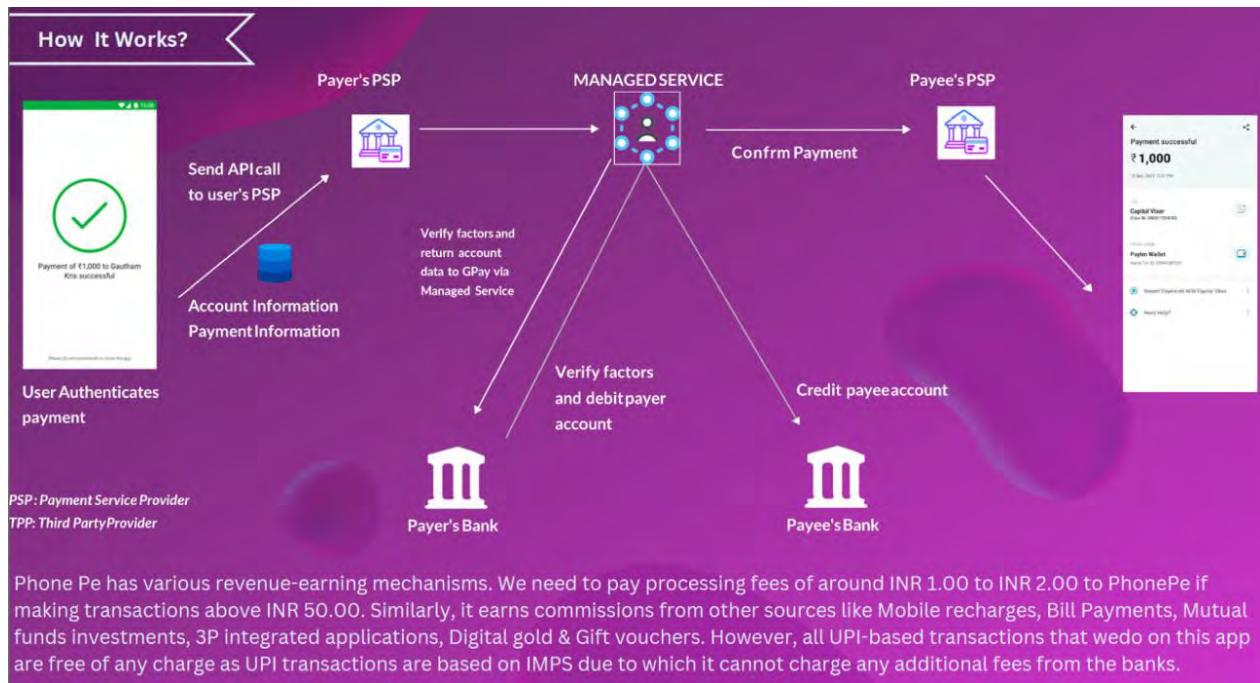
## About the Company

PhonePe, a mobile payments application, enables instant money transfers using just the recipient's mobile number. The objective is to simplify digital payments, ensuring they are easy, secure, and universally embraced, eliminating the need for carrying physical cash or cards. The vision is to construct an expansive, scalable, and open transaction ecosystem that generates significant positive outcomes for all involved parties. As India's inaugural UPI app, PhonePe has secured its position as the market leader, surpassing Google Pay, thanks to its user-friendly interface, multilingual support, and investment assistance.

## Problem Statement

Improve PhonePe Mobile App in terms of notifications and overall user experience.

## High-level process



Source: Mohammed KM [Link](#)

## User Personas



**Name:** Manu  
**Age:** 40  
**Occupation:** Small Business Owner  
**Location:** Mumbai

**Characteristics:**

- Has a family with 2 children
- Belongs to middle class income segment
- Not tech savvy but trying to adopt new technology

**Goals:**

- Wants to easier way to take care of necessary expenses like rent, electricity, insurance, credit card bill etc
- Wants to find easy ways to grow wealth

**Pain Points:**

- Difficulty in finding easy to use one stop solution to tackle all his financial needs
- Difficulty in remembering to make bill payments on time



**Name:** Abhishek  
**Age:** 25  
**Occupation:** Business Analyst  
**Location:** Bangalore

**Characteristics:**

- Recently joined professional, low disposable income
- Staying in a flat with 2 other flat mates
- Tech savvy, highly dependent on digital tools

**Goals:**

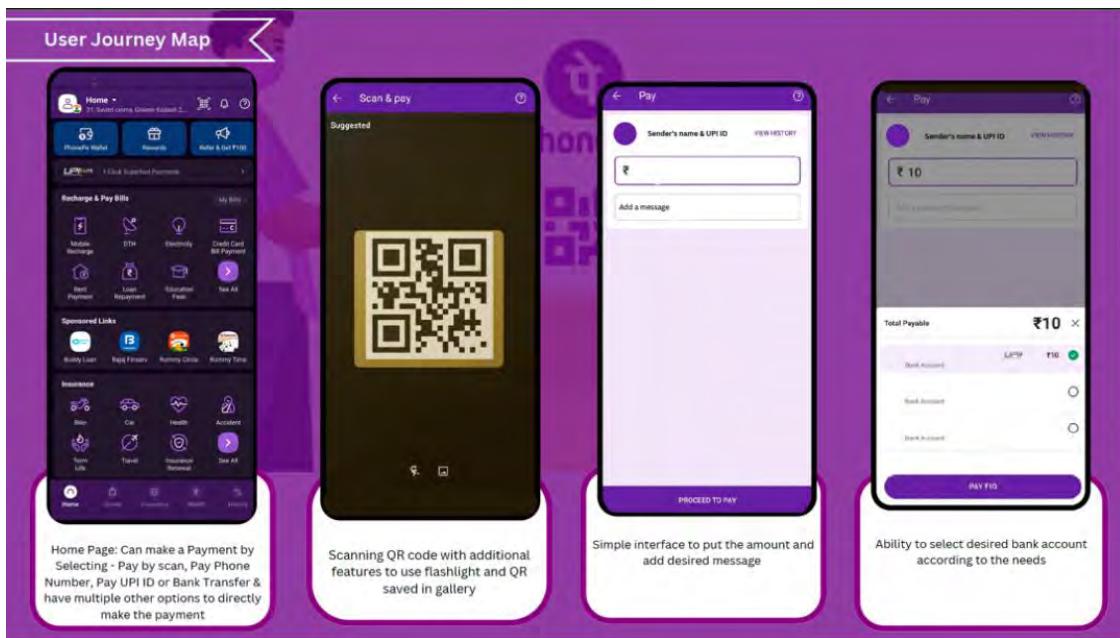
- Easy to use payment tool accepted by majority people
- Easy way to pay basic bills like electricity and gas cylinder
- Knowledge offers/vouchers for different services

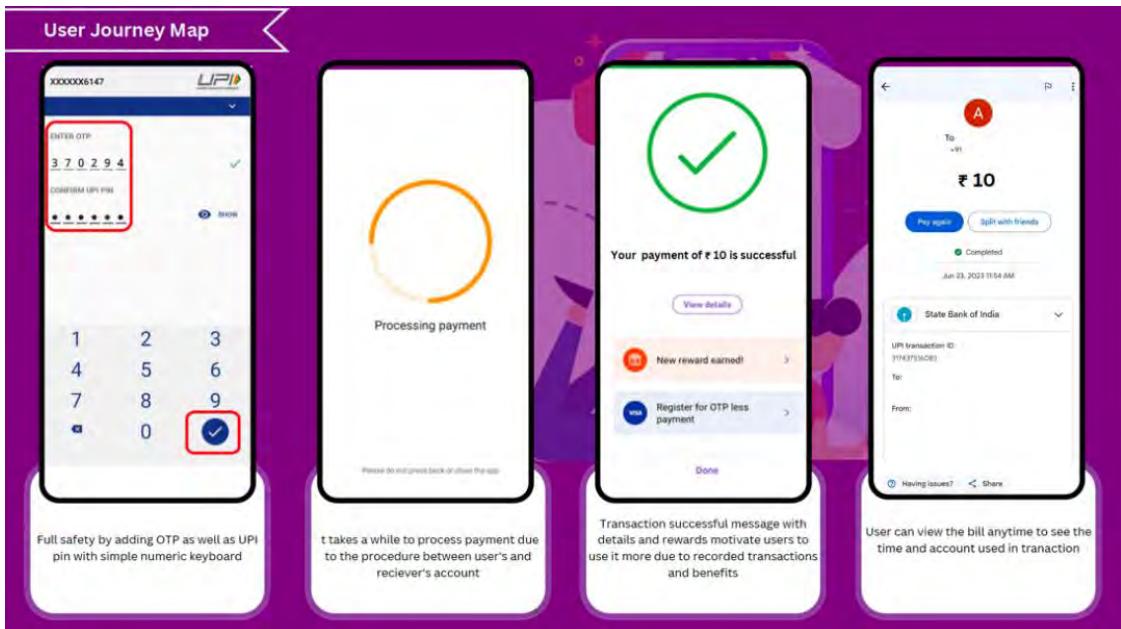
**Pain Points:**

- Difficulty in remembering to pay bills on time
- Difficulty in finding payment service accepted by most people with less chance of technical failure
- Difficulty in knowing latest offers/vouchers

Source: Mohammed KM [Link](#)

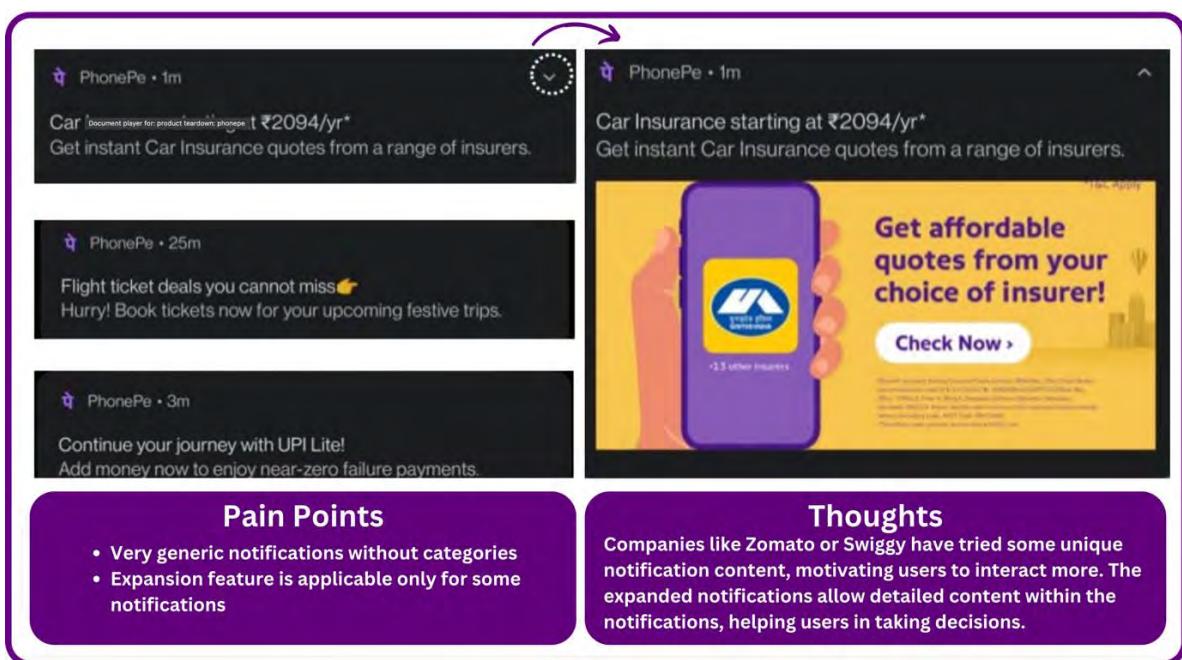
## User Journey:





Source: Nikhil Singh [Link](#)

## Notification system Analysis



**Pain Points**

- Very generic notifications without categories
- Expansion feature is applicable only for some notifications

**Thoughts**

Companies like Zomato or Swiggy have tried some unique notification content, motivating users to interact more. The expanded notifications allow detailed content within the notifications, helping users in taking decisions.

## Recommendations

- Addition of tabs to filter notifications:** To make it easy to navigate the in-app notification, tabs like 'all', 'offers & promotions', 'payment reminders' can be added to easily navigate through various notifications.
- In-app option to personalise the notification content:** Since PhonePe offers a lot of services and pushes notifications for most of them, user's home screen can end up very cluttered and cause inconvenience. Lowering the quantity and adding more engaging content of notifications they receive, can give motivate users to interact more.
- Placement of options to set and customize reminders and bill payment notifications in the notification page itself:** the placement of these options which are currently in the main settings page can be difficult for user to access. placement of these options in the notification page is more intuitive to users and can increase the odds them using this feature



## About the Company

Established in 2006, Spotify is a Swedish audio streaming and media service provider. It is one of the largest music streaming service providers with over 590 million active users. It has a vast library consisting of music from global, local, and indie musicians. Additionally, it also has several podcasts which are exclusive to the app. What makes it more attractive in addition to the plethora of options it has is the personalized recommendations and the social features that it offers wherein its users can create playlists with friends follow other users and listen to what their friends and family are listening to.



## Problem Statement

Evaluate how Spotify can boost user engagement, user retention, and revenue by strengthening what it currently offers and potential new features.

## User Segments

### Artists

These are all the music and podcast producers who create the content.

### Users

These are the actual end users who listen to the music/podcasts.

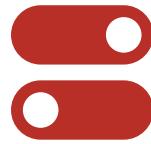
## Value Proposition



Personalized Recommendations



Create and share custom playlists  
(Social Feature)



Myriad of songs & podcasts to choose from

## Main Competitors

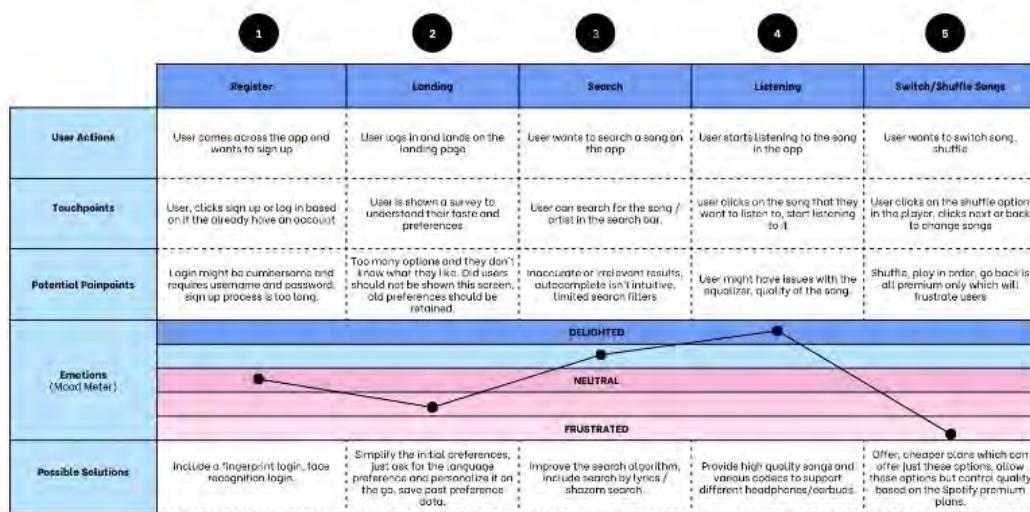


## User Personas



Name	Wael	Nick	Naseeda
Personality	Down-to-earth Easygoing Dependent	Confident Independent Risk-taker	Helpful Independent Resourceful
Goals	<ul style="list-style-type: none"> <li>Discover new music that aligns with his tastes.</li> <li>Stay up-to-date on current trends and emerging artists.</li> <li>Find music for different moods and activities.</li> <li>Create and share personalized playlists with friends.</li> </ul>	<ul style="list-style-type: none"> <li>Seamless and uninterrupted music playback across various devices.</li> <li>Personalized music suggestions for commutes, workouts, and chores.</li> <li>Easy access to downloaded playlists for offline listening.</li> <li>Efficient playback controls for skipping songs and adjusting volume.</li> </ul>	<ul style="list-style-type: none"> <li>Highest possible audio quality for an immersive listening experience.</li> <li>Ability to customize audio settings for different listening environments.</li> <li>Access to lossless or high-fidelity audio options (if available on Spotify).</li> <li>Integration with high-quality audio equipment and streaming devices.</li> </ul>
Pain Points	<ul style="list-style-type: none"> <li>Feels overwhelmed by the vast amount of music available.</li> <li>Frustrated by irrelevant or repetitive recommendations.</li> <li>Difficulty finding music outside of his usual genres.</li> </ul>	<ul style="list-style-type: none"> <li>Interruptions due to buffering or connectivity issues.</li> <li>Difficulty managing downloaded playlists for storage limitations.</li> <li>Inconvenient song transitions between playlists or shuffle modes.</li> <li>Annoying ads disrupting the listening experience (if using Free tier).</li> </ul>	<ul style="list-style-type: none"> <li>Limited control over audio quality settings on the Free tier.</li> <li>Difficulty differentiating between audio quality levels within the app.</li> <li>Lack of educational resources about audio quality within Spotify.</li> <li>Compatibility issues with specific audio equipment or Bluetooth devices.</li> </ul>

## User Journey



## Home Page

After downloading the app first, a bunch of surveys popup



Source – *The Medium* [Link](#)

### The Good

These surveys are not text-heavy but have images to reduce cognitive load, and the users can finish the survey quickly.

### The Bad

Even though I have been a user of Spotify for quite some time, right after registering using my email instead of utilizing the already available data on me, the app asks me to fill out preferences again.

## Search Page



### The Good

#### *For the user*

Spotify is helping me discover music based on what I am doing or my mood. This is better than just a search.

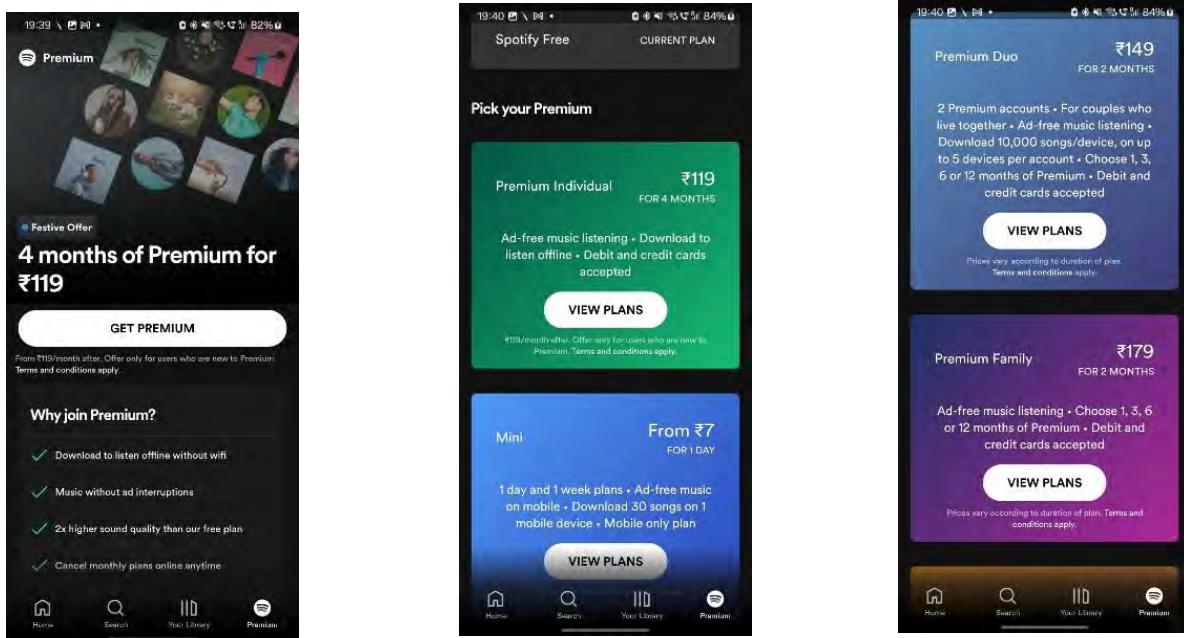
#### *For Spotify*

The user is going to spend more time on the app as they are prone to discover and listen to more than 1 song.

### The Bad

Although Spotify gives interesting/relevant categories, topics, and languages, those are not classified or ordered properly. Hence, finding the right one might be tough.

## Premium Tab



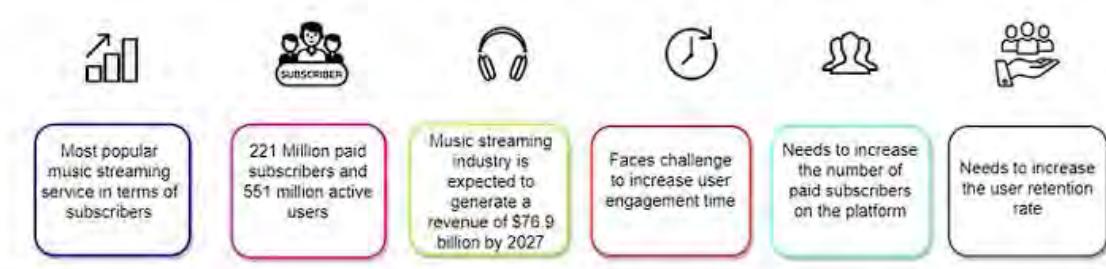
Source – The Medium, <https://bootcamp.uxdesign.cc/spotify-unwrapped-dissecting-a-product-teardown-8ae32981a876>

### The Good

The core music playing tab is present across all the tabs which is not hindering the user from playing or pausing the song.

## Growth Strategy

### Current State



### Key metrics to measure success

Metrics	Definition
Listen-through rate	This measures the percentage of users who listen to a recommended song or album all the way through.
Engagement rate	This measures the amount of time users spend listening to recommended songs or albums
Click-through rate	This measures the percentage of users who click on a recommended song or album.
Retention rate	This measures the percentage of users who continue to use Spotify's recommendations feature after trying it.



## About the Company

Groww is a Demat & stock trading app that allows you to open a free Demat account & trade BSE, NSE listed stocks in the share market at a low brokerage on the stock orders. It has enabled millions of Indians by providing them with an easier option for managing their finances. Groww helps users make their investment process easy, fast and transparent.

## Mission Statement

Groww is on a mission to democratize access to financial services for millions of Indians responsibly.

## Values and Principles



### ***Customers First***

Every decision we make is centred around our customer's needs and convenience.



### ***Simple is Beautiful***

Be it our app, website, or services - we strive to keep making things simpler.



### ***Honesty & Integrity***

We want our customers to be completely aware of everything to do with their investments. Whatever we do is always crystal clear.

## User Segments

The end users can be anyone willing to invest in stocks and other mentioned financial offerings. This could include stock traders, and other people willing to invest.

## Value Proposition



**Free account opening and zero annual maintenance charges**



**Brokerage-free equity delivery**



**Simple and user-friendly interface**



**Ability to invest in US stocks, gold, and fixed deposits.**

## Main Competitors



## User Personas



**Name:** Sunil  
**Occupation:** Retired officer  
**Age:** 55 years

### Goals and Objectives

- To stay up to date on companies in his portfolio and keep investing in them
- Want to analyze his portfolio, change its allocation on the basis of analysis, and change in goals and time horizon with age as compare to early investing days



**Name:** Shreya  
**Occupation:** IT Professional  
**Age:** 25 years

### Goals and Objectives

- Need assistance in finding fundamentally strong companies using fundamental ratios financial statements, growth outlook, etc.
- To invest for long term on bluechip companies on the basis of research done by her



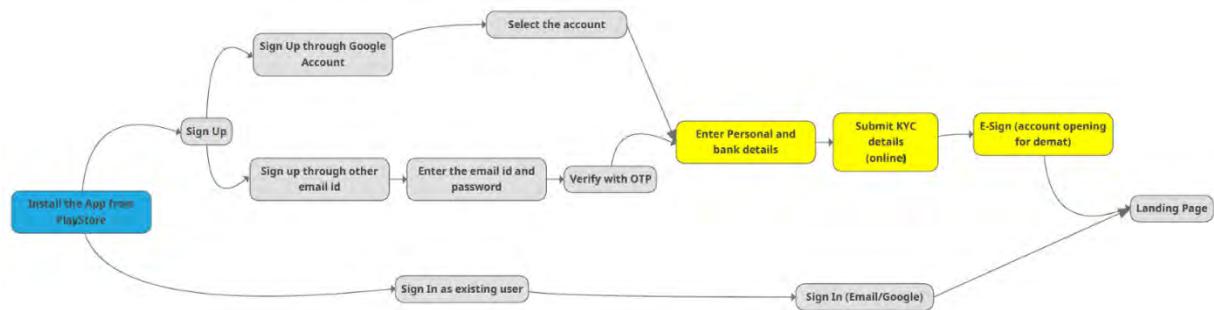
**Name:** Rohit  
**Occupation:** Trader  
**Age:** 35 years

### Goals and Objectives

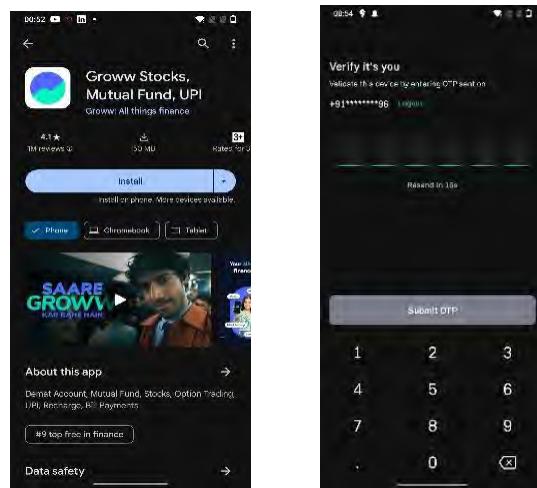
- To allocate 30% of the portfolio to long term investment and use the rest of the amount for intraday and F&O trading
- Looking for investing platform which provides all the information, features, and simple UI

Source - <https://community.producthood.com>

## User Journey



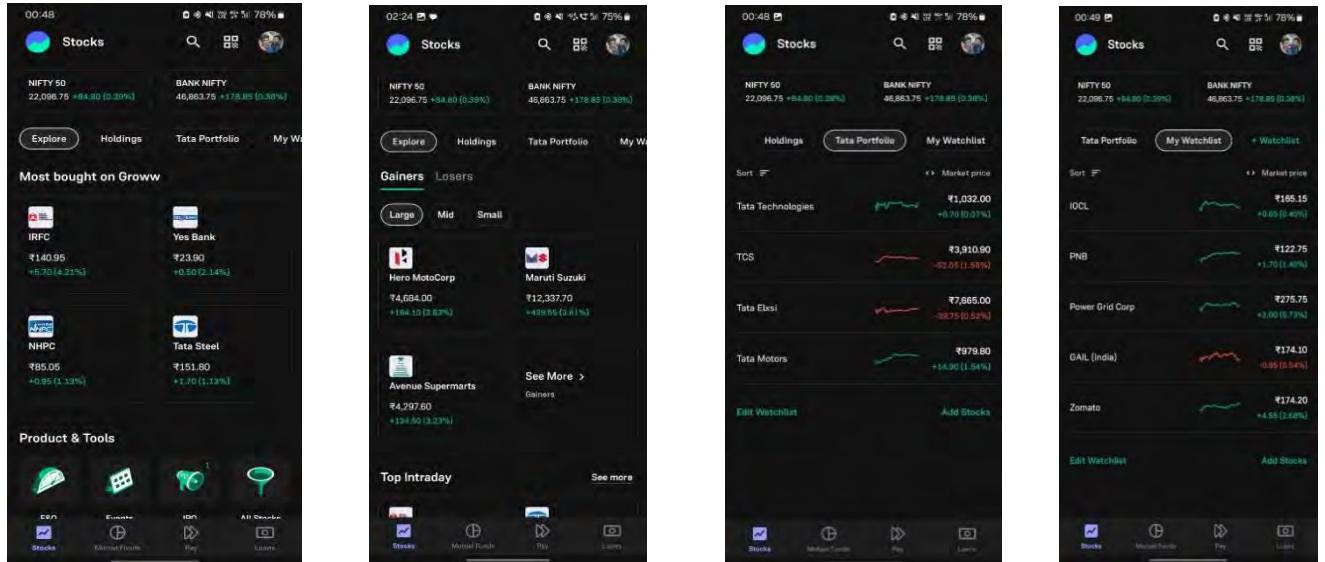
## Play Store Download experience



The user can download the app by searching for the Groww app on the play store. It has 50M+ downloads, rated 4.1 by 1M+ users.

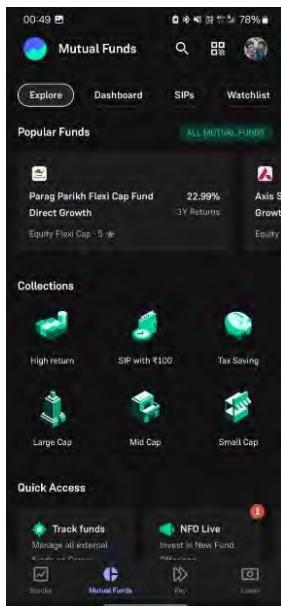
Once the user opens the app, they can either login via an existing account, which then open an OTP page for validation, else create a new account, enter the bank details, get their e-KYC and land onto the landing page.

## Landing Page



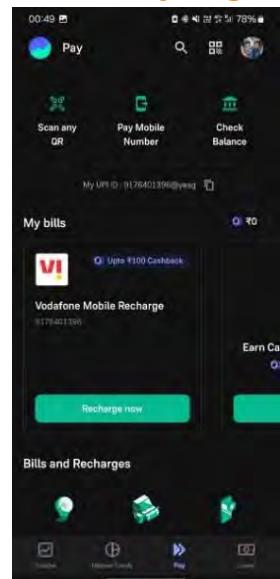
Once the user lands on the landing page, they are presented with the options to explore and search for the different stocks on the market, the most bought stock on Groww in the recent past, and the available various product tools. The product tools include IPOs, Futures, and options, etc. On scrolling down, they are presented with the top Gainers and Losers for the day in large, midcap, and small-cap stocks. The user can also get visibility on the intraday trading, and stock news further below.

## Mutual Funds



Once the user lands on the landing page, they have the option to switch to the Mutual Funds Page. In the mutual funds page, the user has the option to check the top gainers and losers, the funds with the highest percentage returns over a 1 Yr, 3 Yr, 5Yr period. The different caps of funds that are available, the most popular funds that are available, and the SIP options. The app also offers options to have a separate watchlist, a dashboard to track the different funds and SIPs that they have opted into.

## Pay Page



The user has the option to recharge their mobile phones, check their account balances, and pay like a UPI app on the pay page. This is a very small offering in Groww and is not as mature as the stock trading, and mutual fund offerings.

## The Good & The Bad

Journey 1 - Acquisition		
Good	Bad	Ideas to Improve
The Onboarding Experience is great. Smooth Interface which is easy to understand	1. User is not aware of the steps that are yet to be completed. 2. Users get skeptical when confidential details like PAN Card / Bank Account Number is asked	1. A Step Counter must be added at Bottom Center. 2. Secured by _____ ( such line should be added at the bottom of every field that inputs confidential information )
Journey 2 - Investment in Stocks / Mutual Funds		
The UI is Clean and easy to understand. Major highlights such as Index, Top Performing Stocks , Least Performing Stocks and multiple important pieces are placed at the first glance	1. No Feature that helps user understand the available features in application 2. A Beginner has no guidance from app in investment journey	1. There should be a Intro Nudge that hovers over Application to guide over the important Features that user should explore 2. User may come for Trading / Investing - Groww should guide them with inhouse developed reference material to scale the adoption. As of now its only acting as platform that helps people trade / invest who are already smart enough to take their decision. <b>This will be part of Groww Pro</b>
Journey 3 - Retention		
Good	Bad	Ideas to Improve
-	Once Investment is done, there is no other motivation for user to come back ( except Checking portfolio ) or spend time over Groww	1. Users in this market would always look for content that helps them upskill. Groww can integrate Goal Based Self-Learning Content which on completion gives certain rewards ( eg. Discount on Groww Pro )
Journey 4 - Referral		
Good	Bad	Ideas to Improve
Current Referral Policy is well structured and with sync to what other competitors are offering	-	-

Source - <https://community.producthood.com>

# NEW PRODUCT DESIGN

## SECTION 7



BITS SCHOOL  
OF MANAGEMENT



# NEW PRODUCT DEVELOPMENT

## What is Product Development?

The term "product development" encompasses all phases that go into creating a product, from conception to market launch and beyond. To put it another way, the whole lifecycle of a product is included in product development.

## Stages in Product Development

These are the most typical stages that products usually go through, while there are numerous steps in this process and each organization will follow a different path:

**Identifying a need in the market**  
Products provide solutions to issues. Therefore, the first step in this trip should be to identify a problem that needs to be solved (or a better manner to be solved). User research initiatives such as surveys and conversations with prospective consumers might provide valuable insights for this step.

**Potential of the market**  
Not all issues are serious enough to require a product-based solution. But whether or not it's an issue worth solving and whether or not people are willing to pay for a solution depends on how much suffering it causes and how many individuals or organizations it affects.

### Product Conceptualization

While some solutions might be clear-cut, others might be less so. This is the part where the team works hard and uses imagination to figure out how a product could fulfil its needs.

### Validation of the solution

Before spending too much time designing and experimenting, it is important to determine whether the suggested solution is workable. Of course, conceptually, this is still possible. It is still an early test to determine whether the specific product idea will be rejected or only sporadically embraced by the target consumer, or if it is worth pursuing further.

### Build the product roadmap

Once a valid product concept has been developed, product managers can create the product roadmap by determining which core objectives and themes should be developed first in order to address the biggest problems and encourage user acceptance.

### Developing a minimum viable product (MVP)

This initial version of the product needs just enough functionality to be used by customers.

## Rolling out the MVP to users

Experiments can be used to measure interest, rank marketing messages and channels, and start experimenting with packaging and price sensitivity. In addition, it initiates the feedback loop, which adds concepts, grievances, and recommendations to the product backlog and helps prioritize them.

## Iterations based on user feedback

Once a product is on the market, customer feedback through a variety of channels will drive improvements, expansions, and modifications. The goals the organization sets for this product and the lessons learned will be considered when the product roadmap changes over time. Until the time comes to sunset a product at the end of its lifecycle, this work will never finish.

## How to Create a Product Development Plan?

A product development plan, which should not be mistaken with a project plan, covers the entire idea-to-market path. As many stakeholders as possible should be included and included in order to make sure that all of their unique wants, demands, and concerns are taken into account, if not solved.

### Product vision

It starts with a product vision that unites all parties behind the same goal for this product. A product mission statement, which outlines the product's ultimate goal as well as its target audience and intended use, comes next. In conclusion, it delineates a few guiding concepts for the subsequent work.

The product's main objectives can be determined after the vision and mission statements have been created. Early on, these could be a little hazier, like determining product-market fit, but they can quickly develop into quantifiable KPIs or OKRs. These quantifiable goals aid in determining what features, improvements, and functionalities the product must have to meet them.

### Create a roadmap

The product team can then create a product roadmap, ranking the important topics to be addressed in order of priority, assuming that consumer research and validation have previously taken place (we'll go into more detail about product roadmaps in the following section). Date-based goals and milestones can be set, but the emphasis should be on producing value and adjusting to the product goals and performance against important metrics, with the least amount of attention being paid to dates.

### Implement the roadmap for maximum impact

It's time to get things done after the product roadmap is approved. It is possible for implementation teams to make timetables, divide important themes into sprints, and produce iterations of the product. Customers, the sales team, and support all provide input in this way, highlighting areas that need to be refined, improved, and expanded as well as presenting fresh potential and flaws. After then, a cycle of data evaluation, feedback synthesis, and constant product roadmap updating takes place, along with product backlog grooming to guarantee that every development cycle is used to its fullest.

# WEARABLE DEVICE FOR CHRONIC ILLNESSES

## Case 1: Develop a wearable device that simplifies medication adherence for patients with chronic illnesses.

**Candidate** – Could you also please let me know what we are trying to achieve with this product?

**Interviewer** – what do you think?

**Candidate** – Potentially improve the ease of medicine delivery and make their life easy.

**Interviewer** – Precisely.

**Candidate** – I would like to understand the issue a bit more. Is there a specific disease we are talking about?

**Interviewer** – You are free to assume that.

**Candidate** – I would like to focus on Diabetes as that is the new cancer and requires constant medication and dietary monitoring. Is there a specific age group that you'd want me to focus on?

**Interviewer** – You can consider the 20-60 age range.

**Candidate** – great thank you. Are there any existing solutions?

**Interviewer** – There are traditional pillboxes and phone reminders. We don't have a complete solution.

**Candidate** – Got you, I will try to understand the current customer pain points and look at possible improvements or alternatives to the existing solution. We have close to 500

million people suffering from diabetes worldwide. Most people suffering from the disease live in low and low-middle-income countries. Based on this info we might need to develop a cost-effective but complete solution. Is my understanding and structure fine so far?

**Interviewer** – Sounds Good, please go ahead!

**Candidate** – These are the potential pain points that people with diabetes are facing –

- Forgetfulness due to busy schedules or cognitive decline.
- Complex medication regimens involving multiple medications and timing considerations.
- Fear of needles or side effects impacting adherence.
- Lack of motivation or understanding of long-term benefits.

The current solutions we have are –

- **Pillboxes** – these are inconvenient and can be easily forgotten. Also, for diabetes pillboxes can't always come in handy as Insulin Injections are widely used nowadays.
- **Phone reminders** – phone reminders are easily missed or snoozed for a later time which is then completely forgotten.

- **Existing wearables** – don't address glucose monitoring or dietary integration needs.

These are potential issues that need to be addressed. Is my understanding of the current scenario fine so far?

**Interviewer** – Seems good, please proceed.

**Candidate** – 3 personas come to my mind:

#### The Busy Working Parent:

**Demographics:** 30-45 years old, juggling work, family, and self-care. Diagnosed with Type 2 diabetes.

**Challenges:** Difficulty finding time for healthy meals and exercise amidst a busy schedule. Prone to forgetting medication due to distractions.

**Needs:** Wearable that integrates with meal planning apps and suggests healthy options based on medication needs. Automated reminders with customizable alerts for medication, meals, and activity goals. Gamification elements and social support features for added motivation.

#### The Cost-Conscious Diabetic:

**Demographics:** Limited income relies on public health insurance or medication assistance programs.

**Challenges:** Difficulty affording traditional monitoring devices and advanced wearables. May struggle with accessing healthy food options.

**Needs:** Affordable wearable with essential features like glucose monitoring and basic medication reminders. Integration with free or low-cost educational resources and community support groups. Partnerships with pharmacies or insurance providers for subsidized access.

#### The Senior Diabetic:

**Demographics:** 65+ years old, limited technology experience, living independently.

**Challenges:** Struggles with remembering medication schedules and managing complex regimens. May forget to log meals or struggle with using traditional monitoring methods.

**Needs:** Easy-to-use wearable with a large display and simple interface. Voice-activated reminders and medication prompts. Integration with healthcare providers for remote monitoring and support.

Am I good to proceed?

**Interviewer** – Yes.

**Candidate** – Of all the issues, forgetfulness and complexity of medicine delivery seem to be the biggest concerns. I will focus on these aspects to develop solutions.

- **Integrated glucose monitoring:** Allow for painless, real-time glucose level tracking and personalized dosage adjustments.
- **Meal logging and reminders:** Integrate nutrition apps for dietary tracking, personalized meal suggestions, and medication-food interaction alerts.
- **Activity tracking:** Encourage physical activity through personalized goals, progress tracking, and gamification elements.
- **Educational resources and coaching:** Provide personalized educational content and motivational messages based on user data and health goals.
- **Social support integration:** Connect diabetics with communities, support groups, or healthcare providers for accountability and encouragement.

Are there any time constraints that I should consider?

**Interviewer** – Not really.

**Candidate** – while focusing on the solution, I will also be considering the following aspects –

- **Hardware design:** Consider factors like comfort, discreetness, water resistance, long battery life, and seamless integration with glucose monitoring sensors.
- **Software features:** Ensure a user-friendly interface, data security and privacy compliance, HIPAA adherence, and seamless integration with medical apps and services.
- **Scalability and sustainability:** Partner with diabetes organizations, healthcare providers, and insurance companies for wider adoption and affordability.

This would be my priority matrix –

Feature	Impact	Feasibility	Urgency	Overall Score
Integrated glucose monitoring	High	Medium-High	High	High
Meal logging and reminders	Medium-High	High	Medium	High
Activity tracking	Medium	High	Medium	Medium
Educational resources and coaching	Medium	High	Medium	Medium
Social support integration	Medium	Medium	Medium	Medium

The reason for my priority matrix is:

- **Integrated glucose monitoring:** Although technically challenging, it offers high impact by providing real-time data for informed medication adjustment and improved disease management. Its urgency for some patients might be even higher if they experience frequent blood sugar fluctuations.
- **Meal logging and reminders:** High feasibility and impact on dietary adherence, which significantly affects diabetes control. Urgency might be lower if basic medication reminders are already in place.
- **Activity tracking:** While beneficial for overall health, the direct impact on medication adherence might be moderate. Its urgency depends on the target population's specific needs and activity levels.
- **Educational resources and coaching:** Offers moderate impact but is highly feasible and scalable. Urgency depends on the existing

- knowledge and educational gaps of the target users.
- **Social support integration:** While positive for long-term adherence, its impact might be gradual, and the feasibility depends on existing community infrastructure. Urgency is moderate unless social isolation presents a significant barrier.

Based on this framework, integrated glucose monitoring and meal logging with reminders emerge as potential top priorities due to their high impact and moderate-to-high feasibility. However, the final decision depends on:

- **Target user group:** Their specific needs, priorities, and existing access to technology and support systems.
- **Available resources:** Budget, development timelines, and technical expertise available for different features.
- **Competitive landscape:** Analysing existing solutions and identifying where your device can offer unique value.

Should I focus on the identified solutions in further detail?

**Interviewer** – No, this should be good. Can you give me the list of metrics that we would need to measure?

**Candidate:** Sure, the key metrics to measure in this case would be:

- Percentage of users actively using the glucose monitoring feature
- Frequency of glucose measurements taken per day
- Timeliness of response to low or high glucose alerts
- Percentage of users actively logging meals
- Completeness of meal information (time, type, carbohydrates)
- Adherence to personalized meal suggestions based on glucose and medication data.
- Reduction in missed medication doses due to meal reminders.

**Interviewer:** Thank you. This should be enough.

# IMPROVE GOOGLE DOCS

Google Doc

## Case 2: How would you improve Google Docs? What are the key metrics?

**Candidate :** Let me start by sharing my understanding of Google Docs. It is a words processor that's part of Google Workspaces, the service gives users the tools to write, share and edit documents. Am I missing something?

**Interviewer:** No, that sounds right to me.

**Candidate:** Alright, so to start let me share the outline I'll follow to solve this case. I'll start by thinking of Google Docs users, this will help me ask clarifying questions and state some assumptions.

After this, I can define a business goal and top-level metrics to define how a successful improvement looks like.

Then, I will focus on a user segment or a user journey that has the biggest potential to help us reach our goal.

Then I will brainstorm pain points we can solve for this user segment. Next, I'll list solutions and I will talk about their trade-offs, and lastly, I will close with my recommendation.

**Interviewer:** Alright, sounds good.

**Candidate:** Ok, let me define Google Docs users:

**Consumers:** writers, readers, reviewers, editors, kids, adults, elderly, students, teachers, freelancers

**Businesses:** small companies, medium companies, large companies

Strategically, Google is interested in winning market share in the enterprise

market, this is why we made Docs (and Drive) part of our Cloud offering. This goal is particularly more important now that we had a surge in remote work and learning. I'd like to set a business goal to measure market penetration in enterprise offerings, which means focusing on our business customers. An important thing to keep in mind here is other players in the space like Microsoft and Dropbox. Microsoft has an important presence in large enterprises, who are familiar with the Office suite, including even schools, and Dropbox has gained popularity with smaller companies since it has been offering file sharing services for a while now. I think an interesting opportunity for Google here is around small businesses, especially due to our penetration in this area with other services like Google My Business, so let's narrow down in this segment.

With this biz Goal, some of the top-level metrics we can measure here are:

- **# of paying customers**
- **Market share (%)**

We can come back to discuss more detailed metrics once we have discussed a solution.

**Interviewer:** Alright.

**Candidate :** Perfect, let me now brainstorm some of the goals and needs of enterprise customers. When I think about SMBs who could need Docs, customers like Small law firms, accountants, financial advisors, real-

state offices, etc. are the ones I can think of. Here are the pain points and needs I see:

#### For SMBs:

They want to share documents with their teams or clients for collaboration/review.

They need to get approvals to do something on behalf of a customer (signatures or "Looks good to me" confirmations) to complete a process.

They need to keep copies of approved/processed documents for referral purposes.

They need to keep documents safe (from cyber-attacks) to protect confidential information.

They need to ensure documents won't get lost to avoid re-work or economic losses.

They need to send documents to official offices physically or via e-platforms.

#### For clients of these SMBs:

Prove their identity when providing information.

Often, they need to access systems they are not familiar with and are hard to use.

They don't trust or find it hard to trust these services.

It's quite painful to scan/gather information to fill similar forms over and over.

I believe one of the most painful use cases where we could improve Docs for the SMBs and their customers is sharing information to complete a process with a third-party entity such as home-buying applications, immigration processes, etc. I also don't think Microsoft or Dropbox are providing solutions for these use cases now, so it's a good way to differentiate and gain market share. Let me now brainstorm solutions.

#### Solutions:

Integrate Google Accounts with Docs to create an electronic ID to certify identity.

Integrate Docs with systems used for procedures like immigration, loans, etc.

Build a solution to help users keep all their procedural information together to re-use in multiple procedures (like the old-fashioned thing of keeping files with important docs)

I'd prioritize the solution of creating a cyber-ID using Google Accounts to allow Docs to process official documents. This product would align with Google's mission of organizing the world's information and making it useful and available for everyone and will differentiate Docs from other offerings. Of course, one of the risks would be to strike a balance with data privacy and security, but I trust we can solve this leveraging our strengths in these areas.

To recap, my recommendation would be to develop an electronic ID leveraging Google Accounts that would enable users to certify identity to collaborate and process official documents using Google Docs. This feature would be available in Google Workspaces for customers who acquire a Business Plan. This would help us increase the number of customers in the SMB market, allowing us to increase our market share in the space.

# GOOGLE PAY FOR CREDIT CARDS



## Case 3: You are a PM at Google Pay. Design a feature for paying credit card bills.

**Candidate:** I would like to begin by asking "Why?" These days, the majority of consumers pay for delivery, retail purchases, and some recurring bills—like internet bills—using Google Pay.

Because credit card holders are a group deemed to have more purchasing power, it is reasonable to charge more for their eyes. Setting up Google Pay as the default payment option for all transactions is the aim of this functionality. A user is more likely to stick with a platform if they can complete transactions more easily. The above tendency appears accurate, given the annual growth in credit card holders and the growing popularity of services like BNPL. Is this what I understand correctly?

**Interviewer:** Yeah

**Candidate:** I would like to restrict the scope to India as a nation because this is a service that is mainly provided there, though it may be extended to other nations in the future.

**Interviewer:** Alright.

**Candidate:** Is it reasonable to presume that people with existing Google Pay accounts would be able to use this feature on their phones?

**Interviewer:** Yeah let's start there.

**Candidate:** While merchants do utilize Google Pay, let's keep the focus on

consumers for now since companies have their own payment and financial procedures.

**Interviewer:** Yes, this will be a consumer first approach in this case.

**Candidate:** Should I be mindful of any time or resource constraints?

**Interviewer:** None.

**Let me now summarize the problem statement:**

**Candidate:** I want to concentrate on the objective of getting more individuals to use Google Pay to pay their credit card bills by using the platform. To keep users glued to the site, it should be easy, insightful, and reliable to pay credit card bills. One day, this interaction might be profitable.

Now that we know what we want to accomplish, let's examine the user personas in terms of their characteristics, actions, manner of using our product, and timing. This is significant because the context in which a product is used creates value.

I can think of the following personas:

Rohan, 34, has a very hectic schedule and travels frequently for his job as an investment bank employee. He possesses two credit cards with varying benefits. He receives daily travel

allowances for which he is eligible for repayment.

Preeti, a 28-year-old dietitian, enjoys shopping. She is continuously making purchases online and developing a YouTube channel. Her favourite feature is the EMI one. Even in situations where she is a little tight on cash, credit cards allow her to spend freely.

To assist his daughter in paying for her international college applications, 50-year-old father Naresh obtained a credit card. He now pays for some of his bills, such as petrol and airline tickets, with the card. He is very diligent with the bill payment.

In the given context I would like to **prioritize the personas**:

Living in a Tier 1 city where Google Pay is widely used, Rahul and Preeti are both youthful, active people. Since money management is a notion that is never taught, it appears that these young people would benefit most from this product. I therefore want to give these two identities priority. So far, are you with me? Are you with me so far?

**Interviewer:** Indeed.

Let's now examine the user journey and identify some of the difficulties that people have paying their credit card bills.

- It can be challenging to remember the multiple dates for each card's payment due. The majority of individuals prefer to pay on the last day, which makes them either forget to pay on time or check the date obsessively.

- It is time-consuming and leaves users unaware of the exact amount they must pay up front because the statements are generated via email or in separate accounts. This results in feeling strapped for cash at the end of the month and not having saved enough to cover all of your bills.
- Users are also unaware of any additional fees or interest that may be assessed.
- Typically, the statements consist only of transaction lines that are not clearly categorised. Sometimes the retailer isn't even mentioned in the text explicitly, forcing the user to go back and find out where they spent that money.
- Individuals start accruing excessive debt when they use credit cards to exceed their budgets. Since the funds are not currently taken out of their bank accounts, the thrill of making purchases takes precedence over the dangers of debt.
- There is insufficient incentive for users to make full, on-time payments to foster positive reinforcement.

### Solutions:

- The Google Pay app needs to allow users to register their credit cards. With the scan card feature, it only requires two clicks. All of the main banks are currently integrated with Google Pay to streamline transactions. To receive information about transactions, due dates, and other details, they must collaborate with credit card firms such as Visa and Mastercard. In the beginning, this would require some incentive

because UPI has damaged its reputation in the payments industry.

- To help customers plan their budget, consumers can be shown the total amount of dues at the beginning of each month. The Google Pay app is frequently opened by users, providing an opportunity to display the due date of their bills. Three days before the deadline, it can show up as a banner T-3. The banner might illustrate how much interest the user will avoid by making timely, full payments. To receive reminders regarding the due date, the user can easily integrate with Google Calendar.
- The user should always be prodded to make full payments when they are ready to do so. They ought should be allowed to if they selected for partial payments to find out how much more they would be required to pay in interest. Making it clear will enable people to see why, financially speaking, it is a poor choice over time. It is also possible to specifically alert users to any hidden fees.
- Receiving transaction data from credit card issuers can offer users a few fascinating insights. Users may be presented with a summary of their most frequent transactions, their credit score, the category in which they spend the most money, and the merchants they patronize. The user might also be prodded if expenditure on things other than necessities increases. Data requests may be made even in cases when entire transaction data is not readily available.
- To limit their expenditure, consumers can create monthly budgets. They might be advised to use their money carefully when they get closer to the cap. A saving tree may enlarge each

time a user achieves their objective, serving as a visual cue.

- After paying the payment, customers may receive rewards and have access to extremely alluring offers based on user data that Google ad services possess. These offers may include Google storage, credits, or other benefits.
- Credit card payments over one lakh should be possible for users.

**The next step is to prioritize these solutions on a roadmap. I would like to use the RICE framework to do the same.**

To enable credit card payments, features #1, #2, and #7 are bare minimum requirements. Differentiation is produced by the capability to process several card payments on a single platform. Because rewards are already in place for previous UPI transactions, #6 incentivizes customers to use Google Pay to pay their bills. This requires minimal work on their part. Later on, this feature's personalization may change. Obtaining the necessary APIs may take some work, but #4 will be a fantastic way to differentiate your product. The third example demonstrates genuine customer obsession, which is likely to boost platform trust. For those users who have chosen to establish that aim for themselves, #5 may be a very personal decision; hence, it may be included in the next version.

**To put it briefly, we should begin working in parallel to obtain the transaction data from #1, #2, #3, #7, and #4. #5 might be accepted as V2.**

# GARDENING PRODUCT FOR META

## Case 4: Design a gardening product for Meta

**Candidate:** are we building it for any specific country?

**Interviewer:** Let's say India only.

**Candidate:** are we building it for any specific platform e.g. mobile/web?

**Interviewer:** Only mobile.

**Candidate:** This app will be integrated within meta platform or will be a separate app?

**Interviewer:** what do you think?

**Candidate:** FB has billions of users and for leveraging that this gardening product should be integrated within meta environment.

**Candidate:** What is the goal behind this product?

**Interviewer:** what do you think?

**Candidate:** The goal of this product is to help people who have a passion towards gardening and shows how meta cares about the nature thus very well aligned with the vision of meta to give people the power to build community and bring the world closer.

**Candidate:** do you have any user segment for which you want me to focus on?

**Interviewer:** no, you are free to choose.

**Candidate:** So, from my perspective the two popular segments are-

**Passionist:** people who have a hobby and passion for gardening we can identify them as people who plant on pots or make a small garden at their home.

**Commercial user:** people who do planting and then sell them for money. For now, I would like to focus on the Passionist as the commercial user are already aware of how+what+when to plant.

### Pain points:

1. Don't know which plant will be suitable according to weather/soil quality and type.
2. Don't know how much area is needed for this plant.
3. Don't know how the plant will look like in future.
4. Don't know how many times and how much watering is needed.
5. Often forget to watering.
6. Plant has got some deceases don't know what to do.
7. I want to share it with my friends, and they can like/share/comment.

### Solution:

1. There should be an option where people can give info about their soil/weather temperature, and it will suggest plants based on the provided info.

2. Show them some images that shows how plant will look like in Future and how much area it will cover.
3. Recommend them how much watering is needed and how many times according to weather and humidity.
4. Send them on time notification for watering so that they never forget.
5. Allow them to post the image of their plant and by using some AI/ML techniques tell them about the decease and cure for same.
6. Provide them an option to share it on meta so that their friends and other can see and get inspire.

Prioritization: for now, we can focus on pain points 1,2,3,4,5 and 7 and their solution 1,2,3,4 and 6 as they are easy to build and if we get more time and resources, I would also like to go with pain point 6 as decease can be a big issue for the users.

**Success metrics:**

1. # of people who have used it at least once.
2. # of people who posted their soil+weather info.
3. # of people who share images of their garden or plantation area.
4. # of responses(like/share/comment) per image.

# AUDIO PRODUCT FOR META

## Case 5: Design an audio product for Meta

**Candidate:** I'll take a couple minutes just to think about it come up with a few clarifying questions.

Is there a specific app or surface within Meta's family of apps and devices that they build that we want this to be a part of integrated into?

**Interviewer:** There's certainly a lot of products within Meta's family I think I'll largely leave it up to you and you're welcome to let me know why you think that's the best place to start.

**Candidate:** I would like to start off with why we even want to build an audio product and does it make sense to build an audio product. I will then dig into who are we building the product for, what user segments. I'll then go into brainstorming a few pain points. Then get into what solutions potentially can be built to alleviate some of those pain points.

**Interviewer:** I like the structure; Go ahead.

**Candidate:** In general, the audio space has been booming um over the past two plus years. One quick stat that comes to mind is Spotify which is the biggest audio streaming platform in the world. I think they saw a 50 percent increase in their paid subscribers from 2020 march to now: so, there's definitely a trend of consumers leaning into audio very

heavily. Given Meta's strengths with respect to the social graph, I think there's an opportunity here to help people come closer together and feel a sense of community through audio listening experiences.

Broadly I think the players in the ecosystem are listeners and creators. Platforms like Spotify, Apple iTunes host audio content. For this conversation, I want to focus on the listener side because I think ultimately, they are the consumers and if the consumers really engage with the product, then the product is successful.

**Interviewer:** Great thoughts, proceed.

**Candidate:** Further digging into how I would want to segment listeners, I thought of two ways in which I could do that one is by demographic. I want to segment them by users who are teens and young adults 12 to 34 which is also the user base that meta heavily wants to build trust and build engagement and then there's people 35 to 55 and above 55.

Another way to segment I think is also based on the type of audio that people consume. There's music there's spoken word which includes podcasts and books. There's also live radio and the reason I segment by type of audio content is that there's been a huge uptick

in podcast consumption specifically with an audio.

and we've seen that music has been losing share to spoken word within audio consumption.

For this discussion I want to look at the intersection of users who are teens and young adults and people who listen to podcasts. They consume audio actively and by actively it means at least two hours of audio every day. I want to quickly jot down a few pain points of this user.

**Interviewer:** Sure. Take your time.

**Candidate:** I like to think of pain points is almost think of it as the user goes through the journey of discovering the product using the product and what they do after using the product. So, in the discovery phase I think one of the biggest pain points that stood out to me is, I don't get contextual or proactive recommendations for what to listen to or what to consume so the discovery process itself is a lot of work for me and to find the right content.

Once people are consuming audio, I think for me personally at least as an audio consumer one of my biggest pain points is it's a very isolating experience listening to audio today. I tend to get bored and lose focus very quickly when I'm in the middle of listening to a podcast or listening to book.

Another one would be, after I finish listening to a podcast or an audiobook, I currently don't have an easy way to share clips or snippets from the content I just consumed. Not the whole content but just clips that really inspired me. I would like to share with my network with my friends and family.

I would prioritize the pain point the boring listening experience and the inability to

really share. The biggest reason being, they are intense pain points especially as an audio consumer. These points play closely into Meta's mission of allowing people to feel closer to other people while they're doing activities and allowing them to feel them alike.

**Interviewer:** Great points, what kind of solutions do you have in mind for the same.

**Candidate:** Proposed solutions are:

**Communal Listening:** Very similar to the watch together product of meta and it exists within their messenger product interface. The user can be on a call with your friend's family whoever and then start listening to something together just like you can watch something.

**Interactive Audio:** The user must be engaged to say like what happens next. "Do you want to see Event A to happen or Event B and then that drives what happens next on the show. So, I think something similar would be great especially for the pain point around you know feeling bored. On top of this we can layer questions uh once every 20 minutes or so within an audiobook listening session or a podcast.

**Immersive Audio:** Integrating Oculus headset with the audio podcast, allowing users to be transported to a different dimension or back in time while listening historic content. The theme of the podcast or the audiobook that the user is listening to.

Considering the success of various OTT platforms on communal content consumption, we have a fare idea that the communal listening feature will have a greater possibility of success. So, this can be a vital addition to the MVP for the short run.



# GOOGLE MAPS FOR SENIORS

Google Maps



## Case 6: Design Google Maps for Senior Citizens

**Candidate:** I think 60 is no longer the retirement age (senior citizen age), given the rise in average life expectancy of individuals. Do you want me to concentrate on a certain age group, or should I consider everyone over 60?

**Interviewer:** It's okay to take over 60.

**Candidate:** Is there a particular objective we want to accomplish? Is it attracting more elderly adults, increasing their level of involvement, or both?

**Interviewer:** Let us consider user engagement.

**Candidate:** Any other constraints that I should take care of as well?

**Interviewer:** Nothing.

**Candidate:** Which platform would you prefer concentrating on, the website or the app? Is this being rolled out globally or just in a certain area or nation?

**Interviewer:** Let us take an app for India, to be specific.

**Candidate:** Let me summarize the problem statement based on the discussion till now: I want to concentrate on the objective of increasing the

number of times elderly citizens use Google Maps to go from one location to another. Since the majority of older persons use Android phones and Google Maps comes pre-installed, I'd guess that they are aware of the existence of a map software on their phone. Google Maps is a highly popular app. Ensuring ease of use for individuals who are not highly tech-savvy is the an added objective. Are you okay with that?

**Interviewer:** Yeah, sounds great.

**Candidate:** Now that we know what we want to accomplish, let's examine the user personas in terms of their characteristics, actions, manner of using our product, and timing. This is significant because the context in which a product is utilized creates value.

I see three possible user personas:

A 60-year-old guy named Ramesh recently retired and launched a wholesaling company. He dislikes being at home and has no health issues. He needs to go to other states and districts for his clients, and he is searching for manufacturers, collaborators, and other resources for his new venture. Because he worked for the government as an engineer, he is somewhat tech savvy.

Chitra, a 65-year-old lady, spent the majority of her life in a tier 2 city. She

would now prefer to relocate closer to her son, if not into the same house, who lives in Bangalore. She is self-reliant and energetic. For as long as possible, she doesn't want to feel like a burden to anyone. She uses her phone for YouTube videos and WhatsApp, and she is quite computer savvy.

Vishnu, who is 78 years old, resides in a tier 3 city in the same home as his children. Other than taking daily walks in the park or visiting the hospital for check-ups, he doesn't venture out much. When he visits the hospital, a driver is always with him, and on special occasions, family members accompany him when he goes out to eat lunch or supper.

In light of the above background, I would want to rank the personalities in order of most usefulness to the segment:

**Candidate:** Older adults who don't go far are the type of people who will use Google Maps seldom. There is a small subset of people that wish to take chances and launch a business at that age. However, a lot of elderly people choose to remain independent or relocate closer to their kids. I will give this segment priority because this persona has a lot of use cases where Google Maps is a useful product. So far, are you with me?

**Interviewer:** Great thoughts. What's next?

**Candidate:** Let's identify some of the users' pain issues as we proceed through the user journey. Additionally, we can add to this list some of their widely held ideas about customers that prevent our consumers from interacting with our product to the intended degree.

a. I've never done this before, and looking at a map and driving or walking

seems too difficult. I could become overwhelmed and lose concentration. All I have to do is ask around for directions and locations.

- b. It appears crowded, is challenging to operate, and has more options than I need on the screen.
- c. The voice assistant has an accent, so when she talks quickly, I have trouble understanding her.
- d. In heavy traffic, I prefer not to venture outside. I also tend to forget about appointments, which forces me to hurry. Therefore, I would rather reschedule the appointment or be accompanied by someone.
- e. My loved ones and kids don't want me to travel too far by myself.

#### **Some potential solutions for resolving these issues:**

Senior folks should be identified by their age, in which case a more straightforward user interface that is easier to use and less crowded, should be launched. Some features should include:

(1) Users can avoid needing to view the screen while driving by adjusting the voice assistant's pace to be somewhat slower (which they can choose) and perhaps utilizing the native English accent to pronounce destinations more accurately. In due course, it can also be translated into several regional tongues.

(2) Using the AR/VR Kit on mobile devices can improve accessibility to the routes. Flyover exits and turns can be difficult, but an overlay on the map, such as an arrow pointing to the precise street or turn, or a change in color at that entrance point, can help you remember locations and follow the correct directions.

(3) Seniors typically visit banks, marketplaces, parks, and hospitals. Contextual alerts can be displayed to users based on user behavior that has been learnt. Therefore, we may alert the user to depart at a given time to avoid traffic or to arrive on time if we know that they have an appointment or go for an evening stroll. This might be expanded even further to display categories according on the user's app launch time. Therefore, if the app is used between 5-8 am. It is possible to see "Parks" as the most noticeable filter.

(4) Seniors who have relocated to a new city might desire to visit the surrounding areas. They don't need to be inundated with options and shouldn't be able to accomplish a lot of things. It is essential to suggest solutions that are tailored to their lifestyle. They prioritize closeness, quality facilities, and safety. Thus, for instance, we should only likely present healthy restaurant alternatives when suggesting one. When they want to take them along on a trip, this can prompt their loved ones to download the app as well.

**Interviewer:** Great points. How would you prioritize these features?

**Candidate:** These solutions can be ranked as per a release roadmap. I would want to use the RICE framework. Changes to the user interface and speech rate (#1 and #2) appear to be relatively easy wins in terms of effort. Since this is a significant UI change, the prototypes may be evaluated by users to gather early input.

#3 has to be well tested as well, since we don't want our consumers to be overloaded with content. For AR to function properly, it also needs enough illumination and an internet connection. It may be deprioritized, at least from MVP, while keeping these in mind.

#4 appears to be feasible and along with personalization. We may begin with a basic rule engine and refine it over time with additional usage. We can provide user-specific categories or suggestions as the recommendation system improves.

Therefore to summarise we can focus on features (#1, #2, #4) in the beginning and keep updating the roadmap from our learnings with customers and stakeholders.

**Interviewer:** Ok. Now assume that all these features are implemented, how would you measure the success.

**Candidate:** I would go ahead with the following metrics to evaluate success:

- (a) How many people are clicking on the notifications and returning to the app?
- (b) WAU - where active is defined as coming to the app and searching for a place
- (c) How many people are turning the data sharing option on?
- (d) How many people can enter the destination correctly?
- (e) How many people can navigate to the desired destination in the desired time?
- (f) How many people are discovering and joining recommended groups
- (g) 30-day retention rate.

**Interviewer:** Thank You. I think we can wrap up now.



## Case 7: Design a theme park application

**Interviewer:** Build an app for a new theme park in Dubai. How will you go about designing it?

**Candidate:** I want to first understand what kind of an amusement park this is. Is it like a water park or is it like Disneyland?

**Interviewer:** It is more like Disneyland and very out there as most things are in Dubai.

**Candidate:** Do we have any resources, budget, or time constraints for the project?

**Interviewer:** Not really. The park is almost ready, so we have about 4 months to launch the app.

**Candidate:** Great, thanks for clarifying. Now that I have these answers in place, I'd like to start with what our goals are for this Theme park app, understand the different user personas, deep dive into their pain points, and then create solutions for them. Lastly, I'd like to prioritize the solutions we will build that help us achieve our north star metric.

**Interviewer:** Sure, let's go ahead.

**Candidate:** People, especially kids, associate Theme parks with happy places. It is a place to create memories and it bears a lot of nostalgia for the adults. The goal of building the Theme

park app is to create virality by delivering a great experience that is monetizable.

**The following personas come to mind:**

**Parents:** Ramesh, an IT professional, is traveling to Dubai with his wife and two kids. It is their first international vacation as a family. Riya is 8 and Rohan is 11. Riya and Rohan haven't experienced a theme park before but are extremely excited about the Rapunzel castle and the water rides.

**Teens:** Arjun, 18, is in Dubai with his family and cousins. It's his 18th birthday and his cousins have decided to celebrate it at the theme park. Arjun loves thrilling rides, be it a loop coaster or drop rides. He is already creating a buzz about it on Instagram.

**Vendors:** Alisha, 30, has been living in Dubai for over 12 years and is very fascinated with how the city has turned itself from a desert into the marvel that it is. She has translated her passion into a souvenir shop at the new theme park where she showcases the most authentic artifacts. She wants people to appreciate the experience and store that memory in the form of souvenirs.

### **With the given context I would like to prioritize the personas:**

Both Ramesh and Arjun are tourists who want to have a memorable experience. Ramesh would talk all about it and recommend it to all his other friends who are also parents. Arjun is already bragging about all the rides he is going to take to all his friends all over Instagram. Therefore, these two seem like a perfect fit. Vendors are very important to the ecosystem but once we have enough traction, we could solve for them. Are you with me so far?

**Interviewer:** Yeah.

### **Candidate: Now going through the user journey let's figure out a few pain points that the users experience:**

Theme parks have hundreds of rides and experiences. Users discover them as they navigate through the park. **Time is short and never feels enough** to cover everything. **That FOMO is real.** But nobody wants to take every ride, they just don't want to miss out on the ones that they would love.

Theme parks **span multiple acres** and navigation is almost always an issue. There are digital TV screens tucked in somewhere that need their navigation to get to. Since the overall process is more exploratory, people spend more time **navigating inefficiently** than experiencing all that the theme park has to offer.

Discoverability is yet another challenge. When traveling with family, there are so many people with **different needs**

now that it almost feels overwhelming to anyone who is managing the others. A cranky child that probably just wants to eat donuts cannot be pacified by Italian food that parents find in the vicinity.

The parks especially during the peak travel months are **crammed** which translates to long lines everywhere. After spending time trying to find the ride, they want to take, **people spend time standing in lines waiting to experience it.** Also, there are details you get to know about the ride probably after experiencing it or just before experiencing it, that could have been a crucial factor in determining whether this was something you wanted to do or not.

**Interviewer:** Sounds good. What solutions can you provide for such pain points.

**Candidate:** The app should have the basic functionalities of booking a ticket online, showcasing a list of all the experiences. These are table stakes, and I wouldn't spend too much time talking about them. Our north star is virality and a great user experience and therefore I'd like to discuss solutions centered around it.

#### **1. Create an itinerary for the users:**

The app could take in a few parameters like rides they like, experiences they enjoy, cuisines they prefer, number of people and create a recommended itinerary that is most ideal for them. The itinerary would optimize for time, route, and experiences that feel best at a particular time. It could then pre-book tickets/ slots for rides, and experiences at that time which saves time for the user.

- 2. Navigation and discoverability**
  - The app should offer navigation around the park, highlighting surrounding places and experiences. People could tap on them to get details on the ride or experience and book tickets. If the rides are crowded, it could suggest an ETA of how much time it would take to get a ride. The users can choose to do something else meanwhile instead of waiting in line. Users also can explore things nearby like a coffee shop, restaurants, or the bathroom. This would help users discover things along the route.
  
- 3. Realtime Pics:** The users could have their photos taken as they do the rides, which could directly be shared on the app. The user could go through them, select the ones they like, and pay to get them. Initially, this could be free for a couple of photos and then monetized.
  
- 4. AR Integrations:** Taking inspiration from the AR experience at Apple headquarters, the app can **leverage AR** to showcase the cool things about rides and experiences as the user overlays the phone's camera on them. Things like the tallest and fastest roller coaster in the world. There could also be spots inside the park where users could come into the frame with some cool characters. For example, This is me singing with Moana.
  
- 5. Sharing and Referral:** The users could get rewarded for inviting their friends to the app. Users could get rewarded with free rides or a chance to pick up their favorite toy from the souvenir shop. The rewards feel so tangible that users are more likely to share and create virality.

The next step is to prioritize these solutions on a roadmap. The approach I'd like to take is using the RICE prioritization framework.

Feature #2 is table stakes for users to have a great experience. #4 is a hero feature of the app that not only differentiates but delights. It would also boost shareability.

#5 would leverage user excitement to further drive word of mouth.

#1 and #3 are good to have. Ideally, we could wait a couple of months to get enough data about what people are enjoying and then build a good recommendation engine to plan the itinerary.

For #3 There could be concerns around clicking photos without consent and tagging them to each user based on their spots. This is also a hard computer vision problem that would require quite an effort to solve.

In short, we should start with #2, #4, and #5 with parallel efforts to get data around experiences people love. #1 could then come in as V2.

**Interviewer:** Great points. What metrics would you use to gauge the success.

#### Candidate:

1. Number of users downloading the app and creating an account
2. Average time spent on the app between T-3 days and T+1 days
3. Number of people sharing their photos on social media
4. Net Promoter Score

**Interviewer:** Ok, That should be fine. Thank You!!

# ROOT CAUSE ANALYSIS

## SECTION 8



**BITSOM**

BITS SCHOOL  
OF MANAGEMENT



# ROOT CAUSE ANALYSIS (RCA)



## What is RCA?

RCA is like being a detective for a problem. If something goes wrong, like fewer people using Netflix or Paytm, RCA helps find the real reason or cause behind it.

In job interviews, they might give you a problem, like "Why are fewer people watching YouTube lately?" and your job is to figure out the cause by thinking and using data.

## Why do interviewers ask about RCA?

Imagine you're a detective, and they want to see if you can think like one. Interviewers ask these questions to see how well you can figure out problems and come up with good solutions. They might ask about a drop in Paytm transactions or less people using Netflix to see if you can use your brain and data to understand what's really happening.

## Four Major Skills Matter

### Product Sense

This is about understanding a product from a big picture view to a detailed level.

It's like looking at a map from 50,000 feet in the sky and then zooming in to see the streets.

### Problem Solving

Involves finding the root cause of a problem, like a detective.

If there's a drop in users or transactions, the interviewer wants to see how well you figure out why.

### Structural Thinking & Communication

This is about how well you organize and express your thoughts.

For example, before jumping into solving a problem, they might want you to first check if the problem is real.

### Domain Knowledge & Background

Knowing about the field (domain) you are applying for is crucial.

It's like having the right tools in your toolbox to do a job correctly.

### Remember

The interviewer is like a coach looking for these skills.

Even if you know a lot about technology, they might be more interested in how you think about design and user experience.

So, focus on giving them what they want to see. Ask questions to understand what they are looking for. Tailor your answers to match what they're interested in.

## Examples of problems

*"Netflix subscriptions dropped by half."*

*"Paytm transactions are down 50%."*

*"Fewer people are watching YouTube each month."*

## Clarification Questions in RCA

### Understanding the Problem

#### **Break Down the Problem:**

If Uber rides have decreased, you'd ask what exactly "Ride" and "Decreased" mean.

Clarify the metric, like understanding what kind of measurement is used.

#### **Details of the Drop**

Figure out if the drop is sudden, gradual, seasonal, or keeps happening.

Ask about the time duration of the decline.

#### **Segmentation of Customers**

Check if the drop is specific to certain customers, like those in a particular area or using a specific platform (like Android).

### Exploring Internal Factors

Look at factors **within** the app itself.

Check for changes in the customer journey, user experience (UX), or policies.

Investigate technical issues or bugs that might be causing the problem.

See if there were any recent changes in pricing for paid services.

### Considering External Factors:

Explore factors **outside** of the app:

- Check for any new government rules or regulations.
- Look for social media issues or public concerns.
- Investigate if competitors are running special campaigns.
- Consider any specific events that might have affected the app.

### Approach

The overall approach entailing a root cause analysis is to breakdown the problem into smaller groups.

After the interviewer is done asking the question, one should make sure to reiterate the question from their side to ensure there are no confusions with their understanding.

### Pre-solution requisites

Next, the interviewer should be asked for a minute for one to gather and structure their thoughts, might as well write a few things on a piece of paper, or make the entire flowchart to seamlessly walk through the approach. One should then iterate the decided approach to the interviewer and seek approval before diving into the solution. It should be made sure that this process is kept short, for about a minute and half, only to involve the interviewer into the solution and increase familiarity.

### Scoping Questions

The interviewee should now start asking scoping questions, (by stating to the interviewer: "I have a few preliminary questions before diving right into the solutions, shall I go ahead asking them?") no specific order is necessary

but brownie points if even the scoping questions are bucketed according to different segments. A good tip is to make little notes of the answers to the scoping questions because they can come in handy even until the last leg of the solution and might need to refer to them. Examples could be about: Geography, timeline, which business of the company is affected (depends on the question), what is the exact impact, which metric is being changed, etc. The scoping questions interaction would look like a game of yes and no. One should not hesitate to ask doubts, although remaining silent for a long time or not being able to convey thoughts confidently and structurally can put the interviewee to a negative light. Another good tip is to prepare a set of scoping questions for different sectors of the tech industry to not miss out on asking any questions. One should improvise depending on the exact problem statement, but it is a good practice to have a set-in mind always. Once all scoping questions are asked, the interviewee should reaffirm with the interviewer that they are done with the preliminary questions and might ask anything similar later if needed.

**Note:** One should try to not use the word “scoping” during the interview, rather, “preliminary”.

### Demographical questions

Next up is the section or bucket where the interviewee asks about some demographic factors to understand the user persona better, such as inquiring about the age groups, gender, location, user preferences, etc. Now, some of these questions could already be covered under the scoping questions but just in case the interviewee would like to

add more structure to their solution and approach, they can bucket all the user related question into a demographic bucket and ask them after the scoping questions section. They can start with asking the interviewer if they can proceed with understanding the user better, hence asking some demographic questions. At this point, the interviewee should have enough data to start with the core solution.

### External Issues/Factors:

Next, the interviewee should validate with the interviewer if they can proceed with asking some external issues that could be a core cause behind the issue. Now, these questions are supposed to be the same question and answer interaction, but the type of questions change here. The external factor questions could include thoughts about any change in economies, COVID effect, governmental factors, questions related to competition or the industry/market in general, socio-political factors, customer reviews/ratings, etc. Basically, anything that is beyond the control of the company facing the issue. If the interviewee is lucky, they might find the solution/cause in this bucket itself. Although, if the interviewer is still not satisfied, and no other external factors come to the interviewee's mind, it is a better approach to move forward with asking the internal factors. It is not advisable to take a lot of time thinking of questions, hence a set of questions for every bucket should be on the fingertips of the interviewee to sound confident and portray complete understanding of the platform/issue.

## Internal Issues/Factors

Next, the interviewee is expected to ask questions related to internal factors of the company in light. These factors include, android v/s iOS platform or website v/s mobile app differences, recent feature rollouts, bug fixes, user complaints, etc. This is a crucial point in the RCA and it is necessary for the interviewee to start including all the notes made during the interaction here to link issues and possibly reach the solution/root cause. If the interviewer still does not seem satisfied and would want the interviewee to go further, the interviewee should waste no time thinking of more questions of the internal factors bucket and move forward.

## Understanding which metric is being defined

Another tip here is to understand which metric is getting affected the most and how is the metric defined. This is another way to understand where the issue is coming from, and which component is getting affected. This might bring the interviewee closer to the solution and leaves a good mark on the interviewer with the knowledge of metrics and some analytical thinking.

## User Journey

The final leg where all the knowledge about the case reconvenes is the user journey bucket. One must come to this point when no other bucket or question could help find the root cause, and which is totally okay. The interviewee should ask the interviewer here if they can now look at the problem from the user journey perspective. There could be multiple user journeys that one can define for the interviewer and seek approval to ahead

with which one. Although this is a completely optional step as sometimes this might complicate the case even more, hence it depends on situation to situation. Once a user journey is selected, one should ask the interviewer if it's okay to break down the journey into 3 phases, the initial, middle and end phase, depending on the problem, and then concentrating on only the selected bucket. This is another way of showing a structured approach, which can keep going in a nested structure as long as its comprehensible. Once a bucket is chosen, the questions to be asked here would be completely based on the problem at hand and the platform but the interviewee must include the findings from the start of the case to the end to reach the solution faster. This is a vague and ambiguous phase of the RCA, and the interviewee can take any approach needed as long as it is structured, and they do not take long pauses and keep trying to link issues and show the understanding of the company and the platform. By this point the interviewer could sometimes help with hints also or the interviewee could reach the solution.

## End Notes

There can be unlimited solutions to the RCA and the interviewer can even change the solution they were looking for initially just to test the interviewee even further.

Be confident & have a structured approach.

Involve the interviewer in the entire conversation and do not have long pauses.

Ask questions to know the product even better if required.



# RCA – CASE 1

## Case 1: Order cancellation on Nykaa is up by 20%. The order cancellation window is 24 hours.

**Interviewer:** We're focusing on Nykaa's beauty products.

**Candidate:** Are we looking into all order cancellations or just those happening after 24 hours?

**Interviewer:** We're concerned about cancellations after 24 hours, when products are ready to ship.

**Candidate:** Are these cancellations mainly for makeup or skincare products?

**Interviewer:** Mostly makeup.

**Candidate:** Is this issue on the app, website, or both?

**Interviewer:** Just the app.

**Candidate:** Is it related to how people pay, like Cash on Delivery or EMI?

**Interviewer:** No.

**Candidate:** When did this issue start? Has it been gradual or sudden? Has it happened before?

**Interviewer:** It started suddenly within a week and is new to us.

**Candidate:** Can I start by exploring all possible reasons before going into details?

**Interviewer:** Sure.

**Candidate:** Could the way we measure this have changed?

**Interviewer:** No.

**Candidate:** Could there be an issue with our data or analytics tool?

**Interviewer:** No.

**Candidate:** Are we running any tests or experiments?

**Interviewer:** No.

**Candidate:** Are competitors like Sephora doing something new or offering sales?

**Interviewer:** No.

**Candidate:** Could our prices be higher than others?

**Interviewer:** Our prices are competitive.

**Candidate:** Is this issue specific to a certain area, maybe due to weather or health concerns?

**Interviewer:** No, this is more significant than what we saw during the pandemic.

**Candidate:** Any bad press or social media backlash?

**Interviewer:** No, nothing like that.

**Candidate:** No new laws affecting us?

**Interviewer:** Correct, no new regulations.

**Candidate:** Since external factors don't seem to be the cause, let's look internally, starting with the customer's

journey from liking a product to receiving it.

**Candidate:** Did any recent feature updates affect this journey?

**Interviewer:** Yes, we've added some new features.

**Candidate:** Do we know why people are cancelling from the cancellation form?

**Interviewer:** They're saying the product wasn't what they wanted, but that might not be entirely accurate

**Candidate:** Could the issue be with users choosing the wrong product shade or size?

**Interviewer:** We've introduced a virtual try-on feature, which should help, but it might cause cancellations if users realize they chose wrong after trying it virtually.

**Candidate:** Could they be cancelling to wait for a sale?

**Interviewer:** No, we're currently having a sale and always announce them in advance.

**Candidate:** Any changes in how customers enter their shipping address?

**Interviewer:** That's unlikely to be a widespread issue.

**Candidate:** Could negative reviews be influencing them?

**Interviewer:** We've started showing more positive reviews, which could be an issue if customers find negative reviews elsewhere.

**Candidate:** Are customers concerned about product authenticity?

**Interviewer:** We removed the authenticity badge image to speed up page loading, replacing it with a text description, which might be affecting perceptions of authenticity.

# RCA – CASE 2

## Case 2: A grocery e-commerce app has had 25% lesser sale. Why?

**Candidate:** Thank you for the question. I have a few clarifying questions. Is this for the Indian market?

**Interviewer:** Yes, you can assume the market is the Indian market.

**Candidate:** Since when are you seeing this problem?

**Interviewer:** From last week.

**Candidate:** Can I take a few minutes to gather my thoughts?

*The Candidate asked for time to put some thoughts together which is a great practice in a case interview.*

*Typical answers from Candidates are lesser cart additions could be because of different reasons depending on what the root cause is. Then they go on and list all the probable root causes without asking clarifying questions.*

*The question is generic, but the expectation is for you to analyse the problem, ask relevant questions, and come to the probable root cause. The Interviewer is not looking for an instant answer like traditional interviews. This is not a test of one's knowledge and facts. It is a test of one's ability to deal with a situation with lots of unknowns.*

### **External Factors**

**Candidate:** For this problem, there could be external reasons or internal reasons. Let me start by asking questions related to external factors.

**Interviewer:** Go ahead, please.

**Candidate:** Did a new competitor enter the market in the last week or so?

**Interviewer:** No major new entrants in the market that we know of.

**Candidate:** Was there a sale/major discounts offered by any of the existing customers in the last week? This is like what Flipkart does in "big billion day" sale or Amazon does in "Great Indian Sale".

**Interviewer:** No sales or offers during the last week by competitors.

**Candidate:** Any factors that affected the overall sale of groceries last week? Was there anything major that affected the entire grocery supply chain? For example, a strike by truck drivers/ last mile delivery drivers.

**Interviewer-** None.

**Candidate:** Was this 25% reduction in cart additions observed in a particular geography or demography or segment or type of products?

**Interviewer:** We have not seen a particular pattern.

**Candidate:** Are there any other external factors that I might have missed? Or can I assume external factors did not impact the problem?

**Interviewer:** For now, please proceed with analysing internal factors. We can come back to the external factors if required.

### **Internal Factors**

**Candidate:** There might be a tool that collects data on cart additions and other data that the company uses. Was there an issue with the data-collecting tool?

**Interviewer:** The data we have been receiving has been accurate. The tool is fine.

**Candidate:** Are you seeing this in the mobile app, web app, or both?

**Interviewer:** We see this problem just in the mobile app.

**Candidate:** Was there an increase in uninstalls in the Android app last week?

**Interviewer:** Nothing alarming.

**Candidate:** Was there an app update that was released in the last week?

**Interviewer:** Yes we did have an app update last week.

**Candidate:** Was this update in Android or IOS or both?

**Interviewer:** This app update was only on the Android app.

*Alright, now we know what the problem is because of the app update on the Android app. Do we know the final root cause though? It is not a good practice to jump to conclusions without asking further questions. It may or may not have*

*been because of the app update.*

*The app update might have been a mere coincidence. If it is indeed because of the app update, which feature in the app is causing this problem? This is something that we need to find.*

**Candidate:** Did the update have anything to do with cart additions?

**Interviewer:** We changed a few things in the user flow. Do you have a more specific question?

**Candidate:** There is a famous case study of the 300 Million Dollar button. An e-commerce company added the REGISTER button after the add to cart. They saw a significant drop in sales when they did that. When they interviewed people, the customers said, "I am here just to buy some products. I don't want to share my personal information." That's when the CONTINUE AS GUEST button was invented. Here the company added the continue button, instead of the register button. Their sales jumped by 300 Million Dollars. That's why the button was called the 300 Million Dollar button.

Did the e-commerce company here introduce the register button after the add to cart?

**Interviewer:** No. There is no register button after the add to cart.

*Here the Candidate tells a little story showing off the knowledge of a famous case study. At the same time, the Candidate has asked a clarifying question. This will leave a good impression on the Interviewer.*

**Candidate:** Did the update have anything to do with the add-to-cart button? Is the add-to-cart button working?

**Interviewer:** We have not seen a problem with the add-to-cart button. It works fine. Products get added to the cart.

**Candidate:** When a user clicks on the cart button, does he/she see the products added? Does the cart button work fine?

**Interviewer-** Yes the user does see the products in his/her cart. No problems with the CART button.

**Candidate:** Are there bug reports related to the user being able to make payments and checkout?

**Interviewer:** We did see some bug reports when a user tries to make a payment.

**Candidate:** Is there a problem with paying digitally with a credit card, debit card, Wallet, UPI, etc.?

**Interviewer:** No. we don't see a problem with any of the payment methods above.

**Candidate:** Is this related to the CASH ON DELIVERY option?

**Interviewer:** Yes, we did see bugs related to cash on delivery.

**Candidate:** I think that the 25% lesser sale in the e-commerce grocery app is related to the cash-on-delivery button in the payment section of the Android mobile app.



## RCA – CASE 3

### Case 3: Flipkart's decline of about 15% of cart additions to the additions to the shopping cart in the last three days.

**Interviewer:** Imagine that we're working at Flipkart and we're noticing that there's a decline of about 15% of cart additions to the additions to the shopping cart in the last three days, can you help us diagnose the issue?

**Candidate:** Before I jump into sort of finding out what the problem is just want to understand what do we define as cart additions here so that we are on the same page.

**Interviewer:** So, cart editions are let's imagine a user that's on the Flipkart app, they add an item to their cart so they may click and there an item appears in their shopping cart.

**Candidate:** Also Flipkart has both website and mobile app so are we looking at a generic 15% decline or has it been observed only on the mobile or app or the website?

**Interviewer:** We're noticing it mostly on the mobile app experience.

**Candidate:** The first question is the cart additions that we are measuring so it's sort of like a metric which might be measured using some analytics tool so have we checked whether this analytics tool was working well?

**Interviewer:** It does seem like the data coming through is good like there's no issues with logging or analytics that have happened in the last few days.

**Candidate:** In India especially Flipkart has a couple of e-commerce giants as competition and so has there been any new announcement or entry of any competitor or any kind of a product launch or a big billion sale for Flipkart or any sale that has been announced?

**Interviewer:** There is low visibility of something like this right now so it should not affect.

**Candidate:** Have we observed if this has impacted customers from a certain city or a region so is there any impact of location on this decline?

**Interviewer:** No.

**Candidate:** Also has any segment been impacted so let's say females of age 20 to 30 who were earlier purchasing a lot of cosmetics have suddenly stopped purchasing that or is it again a uniform distribution?

**Interviewer:** We're not seeing a deviation for any of those sorts of big demographic categories that we typically look at.

**Candidate:** Has Flipkart announced any campaign or any other let's say product or any other sort of subsidiary which might have taken attention away from the mobile app?

**Interviewer:** No.

**Candidate:** When the customer will open Flipkart or launch the Flipkart app on their mobiles if they have already signed in to the app then they will directly see their home page so the first thing that they will see is the home page versus if they are going to sign in for the first time the first screen that they will see is the login screen versus if they are a new user they would see a sign up screen so this will be the first touch point for the customer so the next thing that I would want to know is have there been any upgrades to the mobile app in the last three days on both iOS and android?

**Interviewer:** Yes we have had some major updates recently.

**Candidate:** Are these updates related to anything in the cart addition or are they not at all related to that?

**Interviewer:** So we have improved the checkout flow to make it more seamless in an effort to improve the conversion rate on the checkout experience.

**Candidate:** Also have we observed if this decline is only to iOS customers or only to android customers?

**Interviewer:** We are seeing that only on android customers.

**Candidate:** Have we received any

incidents or bugs report on the app changes that have been done?

**Interviewer:** We are seeing an increase in some bug reports and it seems like there's some bugreports that people are having issues paying or checking out their products.

**Candidate:** I feel that it is something to do with the process from right from seeing the product and finalizing the product to the checkout process. But because we are observing a decline in the cart additions, the first and the directly attributable feature to that would be the add to cart option. The first point where the customer would see that button is on the product listing page, so it does not necessarily have to be specifically the page of that product, but it will be like a generic listing. So, is the button visible there for all the products?

**Interviewer:** You're asking if the button is visible for all the products for the set of users. We can spin up a dev version and kind of look at it, and it does look like the button is visible to us. We're not totally sure if there are other versions where the button might not be visible, but as far as we can tell, it seems like the button is visible on the platforms that we're looking at.

**Candidate:** Okay, and once again, now it comes to the journey from seeing a list of products to selecting the product that the customer wants to add to cart and then clicking on the button. That particular action or that click to action translating that product to show in the customer's cart. So, what we need to do is to observe if this flow is getting completed. Have we logged in the event data, or have we observed the events data wherein the add to cart event is transitioning into the actual product being added in the cart? Do we have that information?

**Interviewer:** Yeah, so when we take a look at the data, we actually see that there's been no cart additions on Android in the past few days. We're actually seeing a huge decline in card additions on that specific version of Android that we've launched, a version of the app on Android.

**Candidate:** I feel that because we are not noticing or we don't have any attributable data to the installs of the app as such. Also, the product discovery or the product visibility

doesn't seem to be an issue as well. My bet would be on the add to cart button. So we should probably do a complete analysis on the event flow for every customer on the Android app to check how many customers are actually clicking on the add to cart button and not seeing or their products are not being added to the cart. So that's where the issue seems to be lying.

**Interviewer:** Yeah, you totally got it.



## RCA - CASE 4

### Case 4: You are a PM at Facebook, and friend requests are down by 10%.

**Interviewer:** You are a PM at Facebook, and friend requests are down by 10%, what do you do?

**Candidate:** Sounds good. Just to get a little feel for the problem, are we looking at a certain period or timeframe that we're seeing friend requests down, or just across the board?

**Interviewer:** Great question. Let's say that normally it's at some level and it just dropped percent overnight.

**Candidate:** Some level happened overnight, sounds good. No specific time period or any information on that outside of that, right?

**Interviewer:** Yes, let's just say it was an overnight drop.

**Candidate:** I think for this question, approaching it from a root cause analysis type style is going to make the most sense. So how I kind of approach these questions is I like to ask some follow-ups to get a little bit deeper on segmentation and where we're seeing the problem and then I've got it bucketed by potential root causes. So contextual, internal, external, and I just have some questions to probe a little bit deeper to see if we can find the issue. Does that sound good?

**Interviewer:** Sounds good.

**Candidate:** Great. We know it happened overnight. There's no other time period. Do we have any information about what segmentation in the world, geographically, is experiencing this issue and any type of platform information like are we seeing this on iOS, Android, mobile web?

**Interviewer:** Let's say that this is in the US, it's across both mobile and web.

**Candidate:** Across all platforms, and we're only seeing it for friend requests, right? **Interviewer:** Right.

**Candidate:** We've got this drop in friend requests in the United States across all platforms, which leads me to have some initial thoughts and inklings about where this might go, but I do have some more questions to ask just to make sure. Is this seeing this on any type of seasonal basis? Does this happen on a weekend or is it repetitive on a holiday, or is this just a one-time thing?

**Interviewer:** Zooming out, we don't see any sort of seasonality. There's no variance that we're concerned about here. It's totally unexpected when we look at the broader trends and historical trends.

**Candidate:** Great. So then, I guess that would lead me to, if I'm walking in and I'm seeing this as a PM, my first gut check would be to check our internal systems and make sure nothing broke overnight on our side before digging externally to see a little bit more and just check that internal box off. In terms of that, are we seeing any information about a degrading product or reprioritization of product needs?

**Interviewer:** Priorities are always shifting. Facebook is a huge company. The friend request feature is still very prominent on the Facebook page. So in terms of UI, no, there hasn't been any large priority shifts around how we're servicing friend requests.

**Candidate:** Great. And then, does the data scientist seem to be aligned with the data that's coming in? Like, is our data quality usually up to par and where it is? Have we seen any changes with our data quality specifically?

**Interviewer:** Data quality-wise, we can trust this data. It doesn't look like there's any problems with data quality here.

**Candidate:** Okay, great. So then, it sounds like on the internal side of things, we're a little bit buttoned up there, so that makes me feel better as a PM, and now we can kind of shift and transition to looking at maybe some external factors that could be causing this problem.

**Interviewer:** Sure.

**Candidate:** Have we seen any major changes in user behavior?

**Interviewer:** No, there isn't anything around user behavior that has caused a sudden overnight drop.

**Candidate:** And then, has anything changed with the market landscape or competitor behavior? I know we just

mentioned that nothing around user behavior caused a sudden drop, but I know our big competition right now is TikTok. So maybe did they launch a better feature in terms of connecting with your friends in the newest update of their app or something similar to that?

**Interviewer:** Looking at TechCrunch and maybe the press releases on some of the TikTok websites, it does look like they themselves are shifting towards being a more social app rather than just being a content app, so maybe there's something there.

**Candidate:** That's good to know. So TikTok shifting to be social and less content-driven. In terms of regulation and marketing, we've been in the news a lot. Has anything new happened that I should know about from maybe the government or any new laws that have changed and kind of changed the way we're allowed to operate?

**Interviewer:** Let's say that overnight a country in Europe passed a law around data privacy and suddenly we're no longer able to operate in that area.

**Candidate:** Just to make sure I have that right, a country in Europe passed a law that changes user privacy, execution for our platform, and it's preventing us from being able to operate in that country, which is preventing operability in that specific country. I think I kind of have enough here to make a well-informed conclusion on what the problem might be. If I miss it based on the notes that I was taking, definitely feel free to hop in and just kind of direct me to the right way. I'm thinking it's a combination of two things: competitors and regulation. One more question about regulation: did this law apply also to TikTok or all social media, or was it just kind of targeted towards Facebook specifically?

**Interviewer:** Let's say it was targeted towards both TikTok and Facebook and any other tech companies that were operating in this country in Europe.

**Candidate:** So generally maybe any social media that's operating in Europe. And then, one more question: have we seen anything major regarding marketing campaign efforts on TikTok or any competitors, or have we ourselves decreased our marketing budget?

**Interviewer:** Yes, let's say due to budget changes, we did decrease some marketing.

**Candidate:** Then, back to the conclusion that I was attempting to draw earlier, I think because of this law, it obviously makes it tough for people in Europe to friend Americans or people in America to friend their friends that might be over in this specific country in Europe. So generally, that new law that just passed is going to decrease friend requests anyway simply because the sheer amount of volume that just simply can't execute because of this new law. And then, in combination with TikTok's new aim to try to shift to be more social and less content-driven, that definitely plays a big role because of just the grip and the hold that TikTok has on society right now and users. They are the number one social media platform at the moment, and with current trends, it seems that it's going to stay that way. And then we also kind of shot ourselves in the foot by decreasing our own marketing budget because now that we've got this new law, we'll probably need to revamp that up in order to make users feel secure or find a solution to this new law that's been passed in Europe. Does that sound about right?

**Interviewer:** Yes, I think these hypotheses sound like there are directions that we can go towards, and I'm curious as the PM for this area, what would you do?

**Candidate:** Well, first, I would figure out how we can work around this law, getting together with the privacy team and lawyers to figure out where exactly does this law come into effect in terms of our own user flow, and then narrowing it down to that specific point and brainstorming, ideating, trying to figure out different solutions or ways that we could work around it, and then maybe come up with a newer version or a new UI flow that could be tested later to see how it fits with users in a new update.

# RCA - CASE 5



## Case 5: Google Pay has had a 10% decrease in payments

**Interviewer:** Google Pay has had a 10% decrease in their payments. Why do you think that could have happened?

**Candidate:** Got it. A decrease in payments implies people are making 10% less payments using Google Pay. Just a quick question first, is this drop like a sudden drop, or have you been observing this for a couple of days or weeks? How is this decrease?

**Interviewer:** We've been seeing this decrease over a couple of months, and it's a gradual decrease.

**Candidate:** The way I want to work with this problem is I'll identify the factors that can cause this decrease. I would essentially look at some external factors, and then we can move on to internal factors. As I ask you some questions, we'll be able to find probably what could be causing this issue.

**Interviewer:** Sure, take your time.

**Candidate:** Just understanding and further scoping down the problem, is this decrease happening for a specific demography, let's say younger folks or all, like any particular city?

**Interviewer:** That's a good point. We are seeing the decrease across all personas, cities; like we haven't

identified any specific geography or persona.

**Candidate:** Got it, so no specific demography. So, any particular devices that we are seeing this in, because, you know, certain iPhones and or Android, any specific drop over there?

**Interviewer:** Nothing special, though in India, Android users are more as compared to iOS, but there's nothing special in terms of device type.

**Candidate:** Got it, okay, so no specific device. Now that I've scoped it out, this problem is happening over no specific demography and no particular iOS or Android devices. Let's look at what could be other factors that could cause this. Is there any bar or maybe some campaign that did not receive well? Did something like this happen recently?

**Interviewer:** No, we haven't done any campaign; it's usual stuff that has been happening.

**Candidate:** Okay, so it's business as usual. Any anything related to seasonality? I mean, you know how sometimes when there's like a festive season, we do shop a lot more which means they probably are making more payments using Google Pay and now because probably there's not a lot of sale and things like that. So do you think

there's some effect of seasonality or maybe we can look at numbers like in the previous year, was there a drop like that last year?

**Interviewer:** Yeah, so we did look at that data, that's a very good point, and we couldn't find any seasonality per se. Like even if that happens, we haven't seen any decrease in the last year or so, it's something that has happened recently.

**Candidate:** Okay, got it. So no seasonality. I haven't seen any new player pop up for UPI, right? There's just three massive players. I know PhonePe did some sort of campaign, but again, you know, we've probably covered something related, but do you think there could be any competitor angle here that let's say you know there's something coming up any other data or insight that you may have as a business?

**Interviewer:** Yeah, so you are right, PhonePe did do a campaign, so we did see a tiny drop in the number of customers coming to the app, but obviously, it's a tiny drop compared to the 10% decrease in payments we are seeing.

**Candidate:** Got it, and this and I assume that this has been happening before the campaign even launched because I think it's pretty recent.

**Interviewer:** Exactly, exactly.

**Candidate:** Got it, okay. Now I think I've covered most of the external factors, right. I would take a little bit of time to think about, let's say, you know, I would love to go through the user journey and understand if there maybe some bug or something and figure out any other factors that could have caused this. So just give me like one second.

**Interviewer:** Absolutely.

**Candidate:** Thank you. Got it. And one thing I forgot to, but this is also part of internal factors, so I could just ask here. I know that the data is calculated correctly, like we can't tag the events differently this time, and we've not changed anything there.

**Interviewer:** Yes, absolutely, everything has been the same in terms of calculation, so no changes.

**Candidate:** Got it, got it. Okay, great. Coming to how does a user journey look like when they're trying to use Google Pay, right? So first, either I go to a store and I scan the QR code, or not store, let's say I'm taking an auto and I scan the QR code, that's one way to sort of make the payment. Another way that I can think of is when I use something like Swiggy, what it does is it opens the Google Pay app directly, and the page requesting payment, so I don't have to think, it just opens, tells me the amount, and the only step left is to add the UPI pin. And the third thing that I can remember is, and this happens specifically when I try to use Apple Pay services. It's not streamlined yet, but you know, I'm on the store, I say I want to pay through UPI payment, and then it just does that wailing wheel, and then I have to go open Google Pay, and a couple of times I've seen that there is sometimes a pop-up, otherwise either there's a small dot on the Apple-based services, right? So this is like the three types in which a user can make payments. Looking at these as three segments, I've written them down as three modes, and then what I want to do is I want to dive into each of these segments and see where the potential issue could be. Do you also want to pick another use case because these are only merchant-related use cases?

**Interviewer:** Oh yes, I forgot. I wanted to first bifurcate whether it's a merchant-related or a peer-to-peer related payment method as well. That was one of the points, but I forgot. So yeah, sometimes I also transfer money to another individual, right? And the other bifurcation is also paying through a bank account, like I transfer my rent using the bank account of my owner. So let's take a step back and go over there first.

**Candidate:** Do you think there is a drop in peer-to-peer sort of payments or from Google Pay to a bank account sort of payment, or is there a drop between merchants and the user type of payment?

**Interviewer:** Yeah, that's a good point. We have seen the drop happening in the merchant use case, and for others like bank transfer, they are pretty much the same.

**Candidate:** Okay, interesting. From this data that you know, while making peer to peer and either through scanning QR codes or phone number, I'm assuming since that has not dropped in the previous cases, I believe that the drop due to scanning a QR code is pretty stable even when trying to pay merchants via QR. Is my assumption fair?

**Interviewer:** Yes, so it's absolutely correct because this happens for both those cases. So fair enough.

**Candidate:** Okay, so now there are two things. First is, you know, the merchant redirecting me to Google Pay and opening the app filled, which is a pretty seamless experience, and I feel like usually I haven't ever myself experienced any payment failures. There could be some UPI error issue that could happen, like when I enter the pin and maybe Google servers are down

or so the payment but since we are at a step which was a little before that, I haven't faced any issues when the merchant directly opens sort of the payment page. But just to narrow it down, do you think there is a drop on that page just to know like for sure eliminate that case?

**Interviewer:** No, that page was like pretty much the same conversion rate, so all good there.

**Candidate:** Okay, yeah, and I assume that because I feel like it's a very seamless experience as well. So I think the last part where I think there could be an issue or you know else we'll have to move further down the funnel is and I face this a lot of times myself where I'm not getting the pop-up sometimes, or the merchant is not in the recent merchants, right? So what happens is I'm unable to find that merchant and even if you find that merchant sometimes if you go to the detail page, you don't get that pay wall, what is that called, like the widget that asks you for the request payment, so that doesn't. So just to summarize, there are two three things here again as well. First would be getting a pop-up, ideally you should all get that pop up, right, so that you can directly go into that page, or at least I should be able to find that merchant in my recent merchants and also see the pay widget. Now, have we made any changes to this flow particularly?

**Interviewer:** Yes, so basically we recently did a release and earlier there were no widgets, people used to get SMS, but now we have completely removed the SMS and people are supposed to receive widgets in the app. So that's something we introduced recently.

**Candidate:** Okay, so by widget, you mean the pop-up the moment the pop-ups should appear, right?

**Interviewer:** Exactly.

**Candidate:** Okay, so I think I'd first want to understand or let's see if this feature was rolled out to everybody. I assume it was rolled out as a global, like as a complete rollout.

**Interviewer:** Yes, it was.

**Candidate:** So have we seen, like, can we roll out, have we seen like a drop in usage of this feature maybe people are not getting the pop-up because of which they are not able to make the payment or maybe like seeing people come to the Google Pay app multiple times to in order to figure out if they see the pop-up, is there any such behavior?

**Interviewer:** Yes, so that's exactly what we've seen. We had an event for how many people are able to click on the pop-

up and that number is not a healthy number as soon as we did a release. So yeah, that's the issue as we would think.

**Candidate:** Okay, got it. So essentially, our system is firing the pop-up, right, and we are expecting a user click, but eventually, that click is not happening because people are just not seeing the pop-up.

**Interviewer:** Exactly, I think like this is completely spot on because we had recently done a release, and it wasn't happening before, and with this release, we are seeing a drop-off.

**Candidate:** Okay, I think we should first try to solve this problem, and if we've solved this problem and the drop still persists, then we have to look at other parts of the funnel, let's say servers are down, etc. But for now, it looks like this is a pop-up issue.



# RCA – CASE 6

## Case 6: Lyft has seen a 5% uptick in cancel rates

**Interviewer:** Lyft has observed a 5% uptick in cancel rates. Your mission is to unravel this mystery with me as your data scientist.

**Candidate:** Absolutely. Let's clarify the scope first. We're zeroing in on driver-initiated cancels, correct? And there's been no recent change in how we're defining or logging these cancellations?

**Interviewer:** Correct, it's about driver cancels, and our metrics and logging methods have remained consistent.

**Candidate:** Understanding the abrupt nature of this change is crucial. Is it fair to say this issue sprang up almost overnight, without any prior indication?

**Interviewer:** Precisely. It's a relatively sudden shift, noticed primarily over the last couple of weeks.

**Candidate:** To dissect this, I propose we examine several angles: market dynamics, technical glitches, driver behavior nuances, and external competitive pressures. Let's tackle market dynamics first. Could this be a seasonal pattern or maybe localized to certain regions.

**Interviewer:** The increase is somewhat more pronounced domestically but doesn't single out any specific locale. And no, it doesn't align with typical seasonal patterns.

**Candidate:** Moving onto technical aspects, could recent app updates or system changes on either the driver or rider side be influencing this uptick?

**Interviewer:** No significant platform or app version-specific changes correlate with the rise in cancels. Our recent experiment with the app icon color also seems unrelated.

**Candidate:** Interesting. Diving into driver behavior, could the initial phase of the ride, from acceptance to pickup, reveal any anomalies? Perhaps changes in pickup distances or times are deterring drivers early on?

**Interviewer:** Data suggests cancellations are indeed clustering towards the start of that journey, but there's no evidence of increased pickup distances or times.

**Candidate:** That leads us to consider external factors. Have there been aggressive competitive moves, particularly from Uber, that might incentivize our drivers to prioritize their rides over Lyft's?

**Interviewer:** Yes, there's been an uptick in marketing campaigns from competitors targeting drivers, possibly affecting their behavior.

**Candidate:** This competitive dynamic might be the crux. To counteract, Lyft could explore

enhancing driver incentives to match or exceed those from competitors, ensuring our drivers remain committed to our platform. Additionally, revisiting our cancellation policies to better balance driver flexibility with platform reliability could mitigate this trend.

## Some practice questions to try out

**So, you are the product manager of a travel website, like Booking.com. You have recently seen a decrease in the number of bookings made on hotel stays. Why?**

**You are the PM of a Spanish language learning app. You've observed that users on your app have increased but the number of subscribers has remained the same.**

# GUESSTIMATES

## SECTION 9





# GUESSTIMATES

## Introduction

Guesstimates have now become an important part of several interview processes at B-Schools and B-School competitions. They are also a lot of fun!

A guesstimate, which is a blend of "guess" and "estimate," is an approximation made with limited information. It's not about reaching a precise answer, but rather about using your logical thinking and available data to come up with a reasonable estimate within a reasonable timeframe.

Here are some key points about guesstimates:

**Focus on the process:** The interviewer is often more interested in how you get to your answer than the actual number itself. They want to see your ability to break down a complex problem, make assumptions, and use reasoning to arrive at a solution.

**Common scenarios:** Guesstimates are frequently used in job interviews, business planning, and market research.

They can be applied to a wide range of questions, such as "How many trees are there in the world?" or "How many pizza shops are there in New York City?"

**Benefits:** Being good at making guesstimates can be a valuable skill, as it helps you to:

**Make quick decisions under pressure:** In many situations, you won't have all the information you need before you must decide. Guesstimates can help you make informed choices even when data is limited.

**Think creatively and solve problems:** Coming up with a good guesstimate often requires creative thinking and a willingness to make assumptions. This can be a valuable skill in any field.

**Communicate effectively:** When explaining your guesstimate, you need to be able to communicate your reasoning and assumptions.

The process of solving a guesstimate problem is simple: Look at the possible parameters that may affect the final quantity and estimate its numbers.

## Cheat Sheet

### Socio-economic data for selected countries

	US	UK	Australia	India
Population	~325m	~70m	~25m	~1,400m
Households	~100m	~25m	~10m	~300m
Persons / household	~3	~3	~3	~5
Median HH income	~\$45k	~\$30k	~\$45k	\$3k
Life expectancy	~80y	~80y	~80y	~70y

### Key advertising metrics

	Definition	Value range
CPM	Cost per 1,000 impressions	\$5 to \$40
CPC	Cost per click	\$0.5 to \$3
CTR	Clickthrough rate	0.5% to 3%

### Selected tech companies, 2018

	Revenue	Monthly Users
Google	Ads: \$115bn Non-ads: \$20bn	YouTube: 2bn Android: 2bn Gmail: 1.5bn Chrome: 1bn
Facebook	Ads: \$55bn	Core: 2.3bn Messenger: 1.5bn WhatsApp: 1.5bn Instagram: 1bn
Amazon	AWS: \$25bn eCommerce: \$210bn	Prime: 100m
Twitter	Ads: \$3bn	320m
Apple	Devices: \$260bn	iPhone: 250m p.a.

Population Data for:	Millions, %
World	8000
India	1400 (18% of world)
Delhi NCR	30
Mumbai	20
Chennai	10
Hyderabad	10
Bangalore	12
Rural India	900 (65% of India)
Urban India	500 (35% of India)
Male India	52%
Female India	48%
Use 50-50 split in most cases unless gender is the only main cut for guesstimate	
0-15 years	30% of India
15-35 years	40% of India
35-60 years	25% of India
60+ years	5% of India
Working Age Population: 60%, Median Age: 30 (28 more precise)	

Annual Household Income, ₹	% of Households
> 20 lakhs	3%
10 lakhs – 20 lakhs	7%
5 lakhs – 10 lakhs	15%
1.5 lakhs – 5 lakhs	45%
< 1.5 lakhs	30%

Other Data for India
Married, Unmarried
Literacy Rate
Internet Users
Population Density
Fertility Rate
Life expectancy
Population Growth Rate
Nominal GDP
Average Household Size
Area

## Tips and Tricks

Estimation queries often involve complex mathematical calculations. Whether you possess strong mental arithmetic skills or not, these tips and techniques can simplify your task.

**Round Numbers:** There are occasions when being a perfectionist and overly focused on details is appropriate, but this isn't one of them. Considering you'll be making numerous rough estimates and "guesstimates," a little flexibility in your calculations won't significantly impact the outcome. Your goal is simply to arrive at a rough approximation. Striving for absolute precision won't serve you well in this scenario.

**Example:** The population of the US was approximately 314 million in 2012, but it's commonly rounded to 300 million for ease of calculation. Similarly, there are typically 8,760 hours in a standard year (or 8,784 in a leap year), but using approximations like 9,000 or 10,000 is usually sufficiently accurate.

**Rule of 72:** Here's a handy and practical tip: to calculate the time it takes for something to double, divide 72 by the percentage increase. For instance, an investment, population, salary, or any value increasing at  $x\%$  per year will approximately double after around  $72/x$  years. This rule provides reasonably

accurate results, typically within 5 or 10% of the actual answer, especially for smaller values of  $x$ .

Even for a 100% annual increase (doubling within a year), this method remains relatively accurate, typically within 30% of the true answer.

**Orders of Magnitude:** When multiplying two large numbers, it's easy to make errors. While small discrepancies in the units digit may not be significant, adding an extra zero or omitting a zero could result in a tenfold or greater deviation. This discrepancy is substantial. Hence, it's beneficial to ensure that your numbers are roughly in the same order of magnitude as the expected result.

One method to achieve this is as follows: after multiplying numbers  $a$  and  $b$  to obtain  $n$ , the total number of digits in  $a$  and  $b$  should be within one of the total number of digits in the result.

**Be Confident:** How often have you heard someone say, "Oh, I'm terrible at math" or "Numbers just aren't my thing"? Whether these statements are true or not, an interview is not the appropriate occasion for such declarations. Companies seek to hire Product Managers who exude confidence—or who can effectively convey it. Revealing feelings of intimidation or admitting to a lack of proficiency in math during an interview is not advisable. Self-deprecating remarks are unlikely to work in your favor.

**Label Your Units:** Many individuals consider labeling units of measurement (e.g., "4 meters") as one of those tedious requirements enforced by school

teachers. However, this practice proves to be invaluable, especially here. A common error that candidates make is becoming confused with their units. They may jot down "4" to represent "4 meters," but when performing calculations, they may overlook that the measurement is not in kilometers. Unfortunately, rectifying this mistake can be challenging. By consistently labeling all values with their respective units, you'll significantly enhance your accuracy and efficiency in the long run.

**Record Intermediate Steps:** Although some estimation questions are brief, many are extensive and entail numerous calculations. It's crucial to document your thought process as you proceed. You may need to revisit your work later for corrections or to reuse previously computed values. Record each step systematically in a clear and easy-to-read manner, allowing for easy reference later on. Consider this akin to "showing your work" to your math teacher. If your approach is well-organized to the extent that another person could feasibly follow it, it will be much simpler for you to identify any potential errors.

**Record Your Assumptions:** It's not unusual for your final answer to deviate significantly from the expected result. In such instances, there are typically two main reasons: either you made a mathematical error (in which case, being organized will aid in locating it) or one of your assumptions was incorrect. Therefore, the more straightforward it is to pinpoint where you made assumptions, the easier it will be to uncover potential issues.

# GUESSTIMATES - 1

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## Estimate the number of users of Google Drive?

### Clarification Questions

1. Understanding of Google Drive
2. Are we looking for personal users, enterprise users or overall users? **[Both]**
3. Are we looking for a particular geography or globally? **[Global]**
4. Are we looking for daily users, monthly users, or yearly users? **[Daily]**

### Overall Approach

The total world population is ~7.5 billion but there are some countries where Google services are not allowed like China and some parts of Russia, so we can eliminate around 1.5 billion people from our set.

We are looking at around 5 billion people and approximately people above 15 and less than 60 will be the ones who are potential Google services users. So we are looking at around 60% of 5 billion, that is ~ 3 billion people.

We can also think about the internet penetration around the globe, which is around 60%, so it will be ~ 1.8 billion people.

Since there are other services as well, like OneDrive, Dropbox etc. we can assume the market share to be 70%, so around ~1.25 billion users of Google Drive

The total world population is ~7.5 Billion , but not allowed in China and Russia.  
So eliminate 1.5 Billion

We are looking at around 5 Billion people and approx. people above 15 and less than 60 will be our potential users.  
So that is ~3 Billion

Internet Penetration is around 60%, so that is ~1.8 Billion

Since there are other services as well, like OneDrive etc., we can assume the market share to be 70%, so that is ~1.25 Billion.

### Gut check of the final number

Given the kind of market penetration, it is okay to have 1 out of every 4 people all over the world using Google Drive.



# GUESSTIMATES – 2

## Estimate the number of hotels in the city

### Clarification Questions

1. Is our focus exclusively on hotels or are we also included Airbnb and lodges?  
**[Only Hotels]**
2. Which city are we talking about?  
**[Bangalore]**

### Overall Approach

The area of interest, Bangalore, will be approximately 600Km<sup>2</sup>.

Given the presence of national parks, lakes, forests, and wetlands, we estimate that approximately 50% of this area is suitable for potential hotel development.

This translates to approximately 300 square kilometres. We can divide this area into 3 parts according to the density, assuming a normal distribution of 25% highly dense for the hotel, 50% dense and the rest 25% low dense.

For highly dense that is closely around 75km<sup>2</sup>, for a Km<sup>2</sup> we can have 5 hotels, that is around 375 hotels.

For mid dense(150Km<sup>2</sup>), on an average, we have around 2.5Hotels per km<sup>2</sup>, so for mid-dense, it will be around 375 hotels.

For low dense (75 Km<sup>2</sup>), on average we would have 0.5 Hotels per Km<sup>2</sup>, so we will have around 35 hotels. The total

number of hotels in Bangalore will be around ~800.

Define the area of Bangalore that will be around 600Km<sup>2</sup>.  
Since there is a national park, a lot of lakes, forests, and wetlands assuming that around ~50% of the area is where a potential hotel can reside.

We can divide this area into 3 parts according to the density, assuming a normal distribution of 25% highly dense for the hotel, 50% dense and the rest 25% low dense.

For highly dense that is closely around 75km<sup>2</sup>, for a Km<sup>2</sup> we can have 5 hotels, that is around 375 hotels.  
For mid dense(150Km<sup>2</sup>), on an average, we have around 2.5Hotels per km<sup>2</sup>, so for mid-dense, it will be around 375 hotels

For low dense (75 Km<sup>2</sup>), on average we would have 0.5 Hotels per Km<sup>2</sup>, so we will have around 35 hotels. The total number of hotels in Bangalore will be around ~800

### Gut Check of the Final number

Bangalore's population is around 1.5 Crores, and it is also a place where a lot of business travelers come and people come for vacations, so safely we can assume that 1 out of every 1000 to be a tourist. So, we will be requiring hotels to accommodate around 15K people. On average we can assume that a hotel will have 20 rooms, so the total number of rooms would be around 16K.

# GUESSTIMATES - 3

## Number of queries answered by Google per second

**Candidate:** Okay Before I jump onto the solution, I have some questions which I want to get clarified. When we are estimating the number of search queries, are we also taking care of search queries for Gmail, YouTube, and Google Maps or is it for Google search only?

**Interviewer:** For now, you can focus only on the Google search.

**Candidate:** Are we estimating the search query from a particular device like mobile or desktop or a total number of search queries?

**Interviewer:** Across all the devices.

**Candidate:** Are we focusing on a particular geography or globally?

**Interviewer:** Globally.

**Candidate:** Alright! let me iterate the goal of the problem. We want to estimate the number of search queries per second answered by Google search across all the devices globally.

**Interviewer:** Perfect

**Candidate:** Okay let me give the overall structure of how I would approach the problem.

Global Population is ~7.5 billion, Internet penetration is ~ 70% and Google market share is around ~80%.

Since people can't use Google in China and some countries like Russia where Google isn't very popular. So, I would want to consider that as well. Total population which we can eliminate ~ 1.5 billion.

I would like to use the 80–20 rule. 80% of the Google search will come from the top 20% of the Users. I think myself to be in the top 20 percentile, on average I do around 15–20 Google searches per day.

So, keeping this into account, we can calculate the Total number of Google search queries.

**Total number of Google search Users**

=  $(7.5 - 1.5) * 0.7 * 0.8 \sim 3B$  (Taking around 3 billion)

= 80% of the Google Search =  $0.2 * 3 * 15$

= 9B search queries per day from the top 80% of people.

Total Google search queries per day =  $9/0.8 \sim 12B$  Google search queries per day

Now to calculate the Google search queries per second Google search Query per second =  $12 \text{ billion} / 3600 = \sim 140,000 \text{ Google search queries per second}$ .



# GUESSTIMATES - 4

## Estimate the market size for driverless cars in the USA by 2030

**Candidate:** Ok, before I start solving, I would like to seek some clarification. When we are talking about market sizing, will it be by revenue or by the total no of users of the product?

**Interviewer:** You can assume it to be market sizing by no. of users.

**Candidate:** Ok, since we are talking about 2030, is it safe to assume that the technological advancements and legalities related to driverless cars will be ready by then?

**Interviewer:** Yes, that's a fair assumption.

**Candidate:** When we talk about driverless cars, will they be fully automatic or semi-automatic?

**Interviewer:** You can assume it to be fully automatic.

**Candidate:** Also, I am assuming the driverless cars will be utilized for personal use and not commercial use?

**Interviewer:** Yes.

**Candidate:** I will iterate the goal of the problem. We want to estimate the market size based on the no. of users for fully automatic driverless cars in the USA by 2030, which are meant for personal use.

Now, talking about the approach, I will use to solve the problem. Firstly, from the population of the USA, we will find

the no. of households who can afford luxury cars. We will calculate how many of these would be fully automatic driverless cars from the luxury car owners. Using the average lifetime value of a driverless car, we will find no. of such cars purchased every year. Then we will project the no. of driverless cars for 2030 using the data on the growth rate for driverless cars.

**USA's population:** ~330 million

**Average household size:** 4

**No of households in the USA:**  $330 \text{ million} / 4 = \sim 80 \text{ Million}$

To afford fully automatic cars, people should belong to the high-income and upper-middle groups.

**Distribution of Luxury cars owned by USA households:**

High-income (10%) can afford 2 luxury cars on average.

Upper-middle-class income (20%) can afford 0.5 luxury cars on an average  
Lower middle-class income (30%) cannot afford luxury cars.

Low income (40%) cannot afford luxury cars.

**High-income households** = 10% of 80 million = 8 Million

**No of luxury cars owned by High-income households** =  $2^8$  Million = 16 Million

**Upper-middle-class households** = 20% of 80 Million = 16 Million

**No of luxury cars owned by Upper-middle-class households** =  $0.5 \times 16$  Million = 8 Million

**Total no. of luxury cars in the USA** = 16 Million + 8 Million = 24 Million

I am assuming that out of every 1000 luxury cars, 1 would be a fully automatic driverless car due to lack of safety and trust in the driverless car technology.

**Total no. of driverless cars in the USA currently** =  $24\text{Million}/1000$  = 24,000

We are currently in 2022. Assuming that the growth rate of driverless cars will be 20% every year and the average lifetime value for driverless cars = 5 years

**Total number of driverless cars in the USA/average lifetime value** =  $24,000/5$  = 4800 = ~5000

**Total no. of driverless cars in the USA in 2030** =  $(1.2)^8 \times 5000$  = ~ 20,000

**~ 20,000 driverless cars in the USA in 2030**



# GUESSTIMATES - 5

## Estimate the number of Uber drivers in Bangalore

**Candidate:** I would like to state the assumptions I am making and seek some clarification. I am assuming that we are talking about pre-covid times when offices are functioning and there is no lockdown.

**Interviewer:** That's a fair assumption.

**Candidate:** Uber has different business verticals like Uber rides, Uber eats, Uber connect etc. It is ok to assume that we are focusing on drivers in the ride-hailing business driving cabs/autos/bikes etc.

**Interviewer:** Sure, you can focus on the ride-hailing side.

**Candidate:** The way I see this question is that if we can cover the demand during peak hours, we are good to go. If we estimate the drivers driving in peak hours, we can get a fair estimate of the demand for rides, and we can find no. of drivers in Bangalore.

**Interviewer:** Please go ahead.

If the peak hours in Bangalore: 8 am — 11 am [3 hours]

**The population of Bangalore:** 13 million

Assuming people in the age group of 20 – 50 will be using ride-hailing services during peak hours for travelling to the workplace etc.

**Average life expectancy:** 80 years

**Potential population:**  $30/80 * 13 \text{ million} = 4.8 \text{ million} \sim 5 \text{ Million}$

Since smartphone penetration and internet penetration are important factors to enable the use of ride-hailing apps, we can take ~ 80% of the people as the potential userbase.

It is safe to assume smartphone penetration and internet penetration to be 80% as the age group of 20 – 50 is comparatively more tech-savvy.

**Users with smartphone/internet:**  $0.8*5 \text{ million} = 4 \text{ million}$

Out of these 4M people, we can assume that 25% of people can afford cab services as others might be blue-collar workers.

**Potential userbase who can afford cab services:**  $0.25*4 \text{ million} = 1 \text{ million}$

Out of these 1M people, again 20% might book cabs as there are other modes of transport like bus, metro or own cars.

**Potential userbase who can afford and use cab services:**  $0.2*1 \text{ million} = 0.2 \text{ Million} \sim 200K$

Assuming Uber and Ola to be the major players in the Indian market with a market share of 40% each and other players like Rapido, Meru etc. with a remaining 20%

**Potential user base of Uber in Bangalore during peak hours:**  $0.4*200K = 80K$

Normally it will take almost 20 minutes for the driver to complete a ride, but in peak hours, there is a lot of traffic, so we can assume that it will take double the time and the waiting time between rides will also increase by 5 minutes.

***Time taken in peak hours to complete a ride:*** 45 mins.

=> 80K rides in 3 hours ~ 25K rides/hour

It will take 45 minutes for a driver to complete one ride, so approximately 4 rides in 3 hours.

= 0.75 rides/driver/hour

So,  $25K / 0.75 \sim 30K$  drivers

***~30,000 Uber drivers in Bangalore***



# GUESSTIMATES - 6

## How many pixel phones are sold in every month?

**Candidate:** Alright, before that I want to clarify some questions, my first question is which geography are we going to consider, or we want to calculate globally.

**Interviewer:** For this you can consider India.

**Candidate:** My second question is , are looking into specific category of pixel phone or overall?

**Interviewer:** High end pixel phones.

**Candidate:** Are we going considering sell from specific channel like online or offline or both? I am also assuming that we are not going to consider any reselling or second-hand phone, we are only thinking about the first buy.

**Interviewer:** Yes, we want to calculate the total pixel phone bought for the first time.

**Candidate:** Okay let me reiterate the problem we are trying to calculate; we are trying to calculate the number of pixel phones sold in India for the first time.

**Interviewer:** Yes, go ahead.

**Candidate:** Okay the way I would like to go about it is, first we can think of the total population of India, then can think about the potential phone buyers by eliminating the children and senior citizens. After that, we can divide the segment according to their income. Later we can

calculate the potential buyer of luxury phone and by calculating the market share, we will be able to calculate the number of pixel sold in year (keeping in the mind the average length of a mobile phone)

**Total Population of India** ~ 1.3 Billion. Out of which people who are 16+ and 60+ are the ones who will be having phones. We can estimate their number to be around 60%.

**Total Indians who have phones** = ~ 800 Million.

Out of this 800 Million, we can divide it into 10% higher class, 20% upper middle class, 30% middle class and 40% lower or lower middle class.

So, we are thinking ~ 80 million higher class people, ~160 million upper middle class, ~240 middle class and ~320 lower middle class.

Since Pixel phone are the ones coming under luxury, so I will neglect the middle and lower middle class, because not many people in that class would be buying that phone.

Out of 80 million high class people, let's assume 50% will be buying luxurious phones and out of 160 million upper middle-class people, around 20% will be buying luxurious phones. Also assume that if some people buy multiple phones,

they are buying 1 luxurious phone, so we are looking around total of 70 million luxurious phones in India.

If we think a phones last on average 3 years, ~25 million luxurious phones sold every year in India, I don't know the exact market share of Google pixel phones in

India, but if I do empirical estimation from my family, friends' acquaintances.

Out of 100 people only 1 is having pixel phones, so I am assuming a market share of 1%.

So we are looking at **~2.5L pixel phones** sold per year in India.

# GUESSTIMATES - 7

## Estimate how many Zoom meetings take place over the course of the average week

We will take a top-down approach for this question.

We assume that the main consumer segment of Zoom users is private sector companies' employees. We assume that users don't use Zoom for their personal calls (use WhatsApp video call instead) and no other segment is the target segment for Zoom.

There are approximately **3 billion people** employed on planet earth. Considering 60% of these people are in government sector/construction site managers (or workers)/NGO workers/public sector/or any employees who don't have to use calling in their jobs.

This leaves us with **40%** of the workers who work in organizations that have meetings daily.

Out of these 40% employees, let's assume around 30% of the employees are working from the office and don't need a calling application because they have these meetings offline, so only **70% of these need a calling application.**

Out of these 40% employees — around 30% are power users who use calling apps at an average of 6 times per day (Managers, Sales, and Support teams),

around 60% users are normal users using calling apps 2 times a day (coders, developers, QA etc.), and around 10% users don't have the need to use calling apps in their jobs (back-office workers, traders etc). So total number of calls per day -

$$3 \text{ billion} * 40\% * 70\% = 840 \text{ million}$$

$$840 \text{ million} * 0.3 * 6 \approx 1.5 \text{ billion}$$

$$840 \text{ million} * 0.6 * 2 \approx 1 \text{ billion}$$

**So total number of calls taking place each day  $\approx 2.5$  billion**

Now, there are 4 applications that capture most of the market — Zoom, Google Meet, Webex, and Microsoft Teams. Let's assume these applications capture 92% of the market with 23% each, then the number of calls placed each day on Zoom -

$$2.5 \text{ billion} * 0.23 = 575 \text{ million}$$

$$\text{Assuming 5 days work week, we get } 575 \text{ million} * 5 = 2.8 \text{ billion}$$

So the number of Zoom calls (big and small) taking place per week is around **2.8 billion.**



# GUESSTIMATES - 8

## Estimate the number of ATMs in India

**The population of India** - 1.3 Billion

**Assumption** –

Let the Rural: Urban split be 70:30% of the total population.

Therefore, the population split approximately comes to,

**Rural** = 900 million

**Urban** = 400 million

Next, we will calculate the number of Households in India,

Assuming there are 4 people in a household for both urban and rural,

(Ideally, we would assume, 3 for Urban and 5 for Rural)

Household split comes to,

**Rural** = (900 Million / 4) = 230 Million

**Urban** = (400 Million / 4) = 100 Million

Next, let's estimate the total number of ATM cardholders in India.

Assuming,

- 70% of Rural household has ATM cards and,

- 90% of Urban Households has ATM cards This comes down to, (70% of 230 Million)

= 160 Million ATM cards in Rural and (90% of 100 Million)

= 90 Million ATM cards in Urban.

Now, let's assume -

In Urban, let say 10% of household has 2 ATMs and rest of the 90% has 1 ATM,

$$= (10\% * 90M) * 2 + (90\% * 90M) * 1 = 18 + 81 M = \sim 100M \text{ ATM users}$$

In Rural, let say 100% of household has 1 ATMs

$$= (100\% * 160M) * 1 = 160 M \text{ ATM users}$$

Now Assuming,

1 ATM is mapped to ~500 users in the Urban area & ~2000 users in Rural area

Total number of ATMs in Urban + Rural India =

$$= 100M/500 + 160M/2000$$

$$= 2,00,000 + 80,000$$

**= 2,80,000 ATMs are there in India.**



# GUESSTIMATES - 9

## Estimate the number of smartphones sold in India per year

**Population of India:** 1200 million

**Population above poverty line:** 70% =  
~ 840 million

**Population below 14 years:** 30%

Hence, proxy figure: 588 million.

**Rural Population (70%):** 410 million  
Rural Households: 82 million

**Rural Mobile Penetration:** Average 2  
per household- 164 million

In rural areas assume that a new mobile  
is bought once in 3 years.

Hence, new mobiles bought in the  
current year-

**55 million Urban (30%):** 176 million

Assume the average number of Mobiles  
per person: 1.5

**Urban Mobile Penetration:** 265 Mn

Assuming that a new mobile is bought  
once in 1.5 years.

Hence new mobiles in the current year-  
176 Mn

**Total New Mobiles:** 231 million

Assuming 3 out of 10 new mobiles are  
smartphones

**No. of smartphones sold=**70 Million

# INTERVIEW PREPARATION

## SECTION 10





# INTERVIEW GUIDE

This section serves as a reference for prepping for a product management interview by reviewing scenarios and example structures commonly encountered in such interviews. Utilize the given sample answers to help structure and formulate your own responses.

***These are just examples, and it's important to tailor your responses based on your unique experiences and achievements. Be sure to highlight specific results and quantify your impact whenever possible.***

## Technical Interview Questions

### Can you explain the principles of Agile development?

- "Agile development is guided by principles such as prioritizing individuals and interactions, responding to change, and delivering a working product. It emphasizes collaboration, flexibility, and customer satisfaction through iterative development cycles."

### How do you implement Agile in your product development process?

- "In our product development process, we follow the Scrum framework. We conduct regular sprint planning meetings, daily stand-ups to foster communication, sprint reviews for feedback, and retrospectives for continuous improvement. This Agile approach allows us to respond quickly to

changes and deliver value in short development cycles."

### What is the role of a Product Owner in Agile, and how does it differ from other roles in the development team?

- "The Product Owner plays a crucial role in Agile by owning and prioritizing the product backlog. They work closely with stakeholders, ensuring that the team delivers features aligned with business goals. This role differs from others as it requires a deep understanding of both customer needs and business objectives."

### How do you prioritize features in an Agile environment?

- "Prioritizing features involves a holistic approach. We consider user feedback, business goals, and technical dependencies. I often use the MoSCoW method to categorize features into Must-haves, Should-haves, Could-haves, and Won't-haves, ensuring the team focuses on delivering the highest value."

### What is the importance of user stories in Agile development?

- "User stories are crucial in Agile as they provide a user-centric perspective on features. They serve as a communication tool, helping the team understand and deliver what the end-users truly need. User stories contribute to transparency and alignment within the

team and guide development efforts in the right direction."

### **How do you handle changes in requirements during a sprint?**

- "Flexibility is key when dealing with changes in requirements during a sprint. We maintain open communication channels within the team and with stakeholders. If changes are significant, we evaluate their impact on the sprint goals, and if necessary, adjust priorities or sprint scope. The goal is to be adaptive while ensuring minimal disruption to the team's workflow."

### **What is a sprint review, and why is it important?**

- "A sprint review is a collaborative session where the team showcases the work completed during the sprint to stakeholders. It's crucial for gathering feedback, validating assumptions, and ensuring alignment with project goals. The review promotes transparency, and the feedback received helps us refine and enhance the product backlog."

### **How do you measure the success of an Agile project?**

- "We measure the success of an Agile project through various KPIs, including velocity, cycle time, and customer satisfaction scores. Regular retrospectives allow us to identify areas for improvement, ensuring that we not only meet project goals but also continuously enhance our development processes."

***Following 3 questions could be asked if you already have any product management related experience:***

### **What challenges have you faced when implementing Agile, and how did you overcome them?**

- "One challenge was resistance to change. To address this, we conducted training sessions to help the team understand the benefits of Agile. Another challenge was adapting to rapidly changing requirements. We mitigated this by fostering a culture of open communication and incorporating flexibility into our planning processes."

### **Describe a situation where you had to reprioritize tasks within a sprint.**

- "In a recent sprint, a critical bug surfaced that required immediate attention. Although it wasn't initially in the sprint backlog, we reprioritized tasks to address the bug promptly. This decision involved discussing the impact on the sprint goals with the team, informing stakeholders, and adjusting our sprint plan to ensure we met our commitments while addressing the urgent issue."

### **Describe a situation where you had to manage changes in requirements during a sprint. How did you handle it?**

- "In a recent sprint, a critical requirement change emerged due to shifting market demands. We conducted an emergency backlog refinement session, assessed the impact on the sprint goal, and reprioritized tasks. Effective communication with the team and stakeholders ensured a smooth adaptation to the changes without compromising the sprint".

### **Can you explain the software development life cycle (SDLC) and its importance in product management?**

- "The SDLC is a systematic process for planning, creating, testing, and deploying software. It provides a framework for managing the entire lifecycle of a product. Understanding the SDLC is crucial for a product manager

as it facilitates effective coordination between development teams, ensures quality, and enables the delivery of a successful product."

### **How do you approach user interface (UI) and user experience (UX) design in the product management process?**

"I prioritize a user-centric approach by conducting user research, usability testing, and collaborating closely with UI/UX designers. Iterative design, incorporating user feedback, helps create an intuitive and enjoyable user experience. Regularly analyzing metrics and user behavior guides ongoing UI/UX improvements."

## **General Product Related Questions**

### **Can you give an example of a product you've managed where user feedback significantly influenced the design and features?**

"In a previous role, user feedback led to a major redesign of our mobile app's navigation. We conducted user interviews, analyzed feedback, and discovered navigation pain points. Implementing a new menu structure based on user preferences resulted in a 20% increase in user satisfaction."

### **What are the key considerations when defining the minimum viable product (MVP) for a new product?**

"When defining an MVP, I focus on core functionalities that address the primary user needs. This involves prioritizing features based on their impact on the user experience and the product's value proposition. By launching with essential features, we gather valuable feedback early, enabling rapid iteration and improvement."

### **How would you balance short-term product goals with long-term strategic objectives?**

"Balancing short-term and long-term goals requires aligning immediate tasks with the overarching product vision. I break down long-term objectives into manageable milestones and prioritize short-term goals that contribute to these milestones. Regularly reassessing priorities ensures that daily tasks align with the broader strategic vision."

### **Discuss a project where you had to collaborate with cross-functional teams. What challenges did you face, and how did you ensure effective communication?**

"Leading a cross-functional project, communication challenges arose due to different team perspectives. I implemented regular cross-functional meetings, emphasizing open communication. Additionally, utilizing project management tools and creating a shared document for updates ensured everyone stayed informed and aligned throughout the project."

### **Explain how you would handle conflicting opinions within a team when making product-related decisions.**

"When faced with conflicting opinions, I encourage open discussions to understand different perspectives. I facilitate brainstorming sessions, ensuring each team member feels heard. Ultimately, I aim to reach a consensus, but if that's not possible, I make decisions based on data, user feedback, and alignment with the product strategy."

## Product Management Frameworks

**Can you explain the Lean Startup framework and how it applies to product management?**

- "The Lean Startup framework emphasizes a build-measure-learn feedback loop to quickly validate or invalidate assumptions. In product management, it encourages iterative development, minimizing waste by focusing on the most critical features, and adapting based on user feedback."

**Describe the Jobs-to-be-Done (JTBD) framework and how you might use it in product development.**

- "The Jobs-to-be-Done framework centers around understanding the underlying needs and motivations of users. By identifying the 'jobs' customers hire a product to do, we can create solutions that address their specific pain points and deliver value beyond surface-level features."

**What is the Kano Model, and how can it be beneficial in prioritizing product features?**

- "The Kano Model categorizes features into basic, performance, and delight factors. It helps prioritize by understanding which features are expected, which enhance satisfaction, and which provide unexpected delight. This approach ensures a balanced feature set that aligns with customer expectations."

**How do you incorporate Design Thinking into your product management process? Can you provide an example from your experience?**

- "Design Thinking involves empathy, ideation, and iteration. In a previous project, we conducted user interviews (empathy), brainstormed creative solutions (ideation), and iteratively prototyped based on user feedback. This approach led to a product that not only met user needs but exceeded their expectations."

**Explain the GIST framework (Goals, Ideas, Step-Projects, and Tasks) and its role in product planning and execution.**

- "GIST is a comprehensive framework that aligns high-level goals with specific tasks. It ensures clarity by breaking down goals into actionable steps, fostering a structured and goal-oriented approach to product planning and execution. This framework facilitates effective communication and execution across teams."

## Product Metrics

**What key performance indicators (KPIs) do you consider when measuring the success of a product?**

- "Key performance indicators vary based on product goals, but common KPIs include user acquisition, retention rates, conversion rates, and customer satisfaction. Additionally, monitoring revenue metrics, such as customer lifetime value and average revenue per user, provides insights into the product's financial success."

**How do you use AARRR metrics (Acquisition, Activation, Retention, Referral, Revenue) in the context of product management?**

- "AARRR metrics help track the user journey. For example, focusing on Activation metrics ensures users have a

positive initial experience, while Retention metrics gauge long-term engagement. By analyzing these metrics, we can identify areas for improvement and optimize the entire user lifecycle."

### **Describe how you track and analyse user engagement metrics. Which metrics do you find most valuable in understanding user behaviour?**

- "User engagement metrics, such as time spent in the app, click-through rates, and feature adoption, provide insights into user behavior. Retention metrics are particularly valuable, indicating the product's ability to keep users over time. Analyzing these metrics helps refine the user experience and prioritize feature development."

### **Can you discuss the concept of North Star Metrics and how you determine them for a product?**

- "North Star Metrics are the key indicators of a product's core value. Determining them involves understanding the primary benefit the product delivers to users. For a social media platform, the North Star Metric might be daily active users. It serves as a guiding metric aligning the team with the overarching product strategy."

### **How do you measure and improve the user onboarding experience?**

- "Measuring user onboarding involves tracking metrics like time to first value, completion rates of onboarding tasks, and user drop-off rates. To improve the experience, I conduct usability tests, gather user feedback, and iterate on onboarding flows to make them more intuitive and efficient."

## **Behavioural, Frameworks & Metrics:**

**When faced with conflicting priorities, how do you use the RICE framework (Reach, Impact, Confidence, Effort) to prioritize features or projects?**

- "The RICE framework helps prioritize by assessing the Reach, Impact, Confidence, and Effort of each feature. By assigning scores to these factors, we can objectively prioritize features that have the highest potential impact and align with overall product goals."

**Explain how the Pirate Metrics (AARRR + L - Acquisition, Activation, Retention, Referral, Revenue, and Lifetime Value) contribute to overall product success.**

- "Pirate Metrics provide a holistic view of the user journey, from acquisition to revenue generation and long-term value. By focusing on each stage (AARRR + L), we create a well-rounded strategy that not only attracts and activates users but also retains and monetizes them for sustained product success."

**In the context of the HEART framework (Happiness, Engagement, Adoption, Retention, Task Success), how do you assess and improve user experience?**

- "HEART is a user-centered framework that assesses various aspects of user experience. For example, measuring task success rates, tracking user engagement, and analyzing retention metrics contribute to understanding user satisfaction. By identifying pain points and successes, we can iteratively enhance the overall user experience."

## **Describe a situation where you used the Build-Measure-Learn loop from the Lean Startup methodology to iterate on a product.**

- "In a recent project, we applied the Build-Measure-Learn loop by quickly developing a minimum viable product (MVP), measuring its performance through user testing and analytics, and learning from the gathered insights. Iterative cycles allowed us to refine the product, ensuring it aligned closely with user needs and expectations."

## **How do you determine the right balance between qualitative and quantitative data when making product decisions?**

- "Balancing qualitative and quantitative data involves using qualitative insights for context and understanding, while quantitative data provides measurable indicators. For instance, qualitative user interviews may uncover pain points, and quantitative data, such as user behavior analytics, validates these findings. The right balance ensures well-informed, data-driven decisions."

## **Mock Interview:**

### **Tell me about yourself.**

Open ended answer

### **Why do you want to be a product manager?**

- "I am passionate about solving real-world problems through innovative solutions. As a product manager, I can drive the entire product lifecycle, from ideation to delivery, which excites me. I thrive in dynamic environments where I can collaborate with cross-functional teams to create impactful products."

## **Describe a successful product you've managed in the past. What was your role?**

- "In my previous role at XYZ Company, I led the development of a mobile app that increased user engagement by 30%. My role involved defining the product strategy, conducting market research, and collaborating with the development team to ensure timely delivery. The success was attributed to our focus on user feedback and iterative improvements."

## **How do you prioritize features for a product?**

- "I prioritize features based on a combination of user needs, business goals, and technical feasibility. I use techniques like impact vs. effort analysis and regularly gather input from stakeholders. This ensures that the features we prioritize align with the overall product strategy and provide maximum value to our users."

## **How do you gather customer feedback?**

- "I employ a multi-faceted approach to gather customer feedback, including surveys, usability testing, and direct user interviews. This not only helps in understanding user needs but also establishes a continuous feedback loop, allowing us to iterate and improve the product throughout its lifecycle."

## **Can you explain the Agile/Scrum methodology?**

- "Certainly. Agile/Scrum is a collaborative project management methodology that promotes iterative development. It involves breaking down the project into short development cycles called sprints, usually two to four weeks long. Daily stand-up meetings, sprint planning, and retrospectives are

integral to this methodology, ensuring flexibility, adaptability, and continuous improvement."

### How do you handle competing priorities and tight deadlines?

- "I am adept at managing competing priorities by first understanding the critical path and focusing on high-impact tasks. I prioritize based on urgency and importance, and I'm not afraid to delegate tasks when necessary. Additionally, effective communication with the team is crucial to manage expectations and ensure everyone is aligned on priorities."

### What steps do you take to understand the market and competition for a product?

- "To understand the market and competition, I conduct thorough market research, analysing industry trends, competitor products, and customer reviews. I also engage in discussions

with the sales and marketing teams to gather valuable insights. This comprehensive approach ensures that our product remains competitive and aligned with market demands."

### Which app do you like the most & why?

*When responding to the above question, the following structure can be employed: Express your appreciation for innovation, select a product that has demonstrated value and aligns with the industry or domain relevant to the position. Discuss its features, user experience, and the impact it brings to users and the market. Explore how the product introduced innovative strategies or features as its entry product, catered to retaining customers, and attempted upselling later.*

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# THANK YOU

