



# Software product management

## Introduction

**BITS** Pilani

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# Contents

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- Software products scenario
  - What is spurring product industry?
  - Different product categories
  - Project business vs Product business
  - What is Product management?
  
  - About this course
-

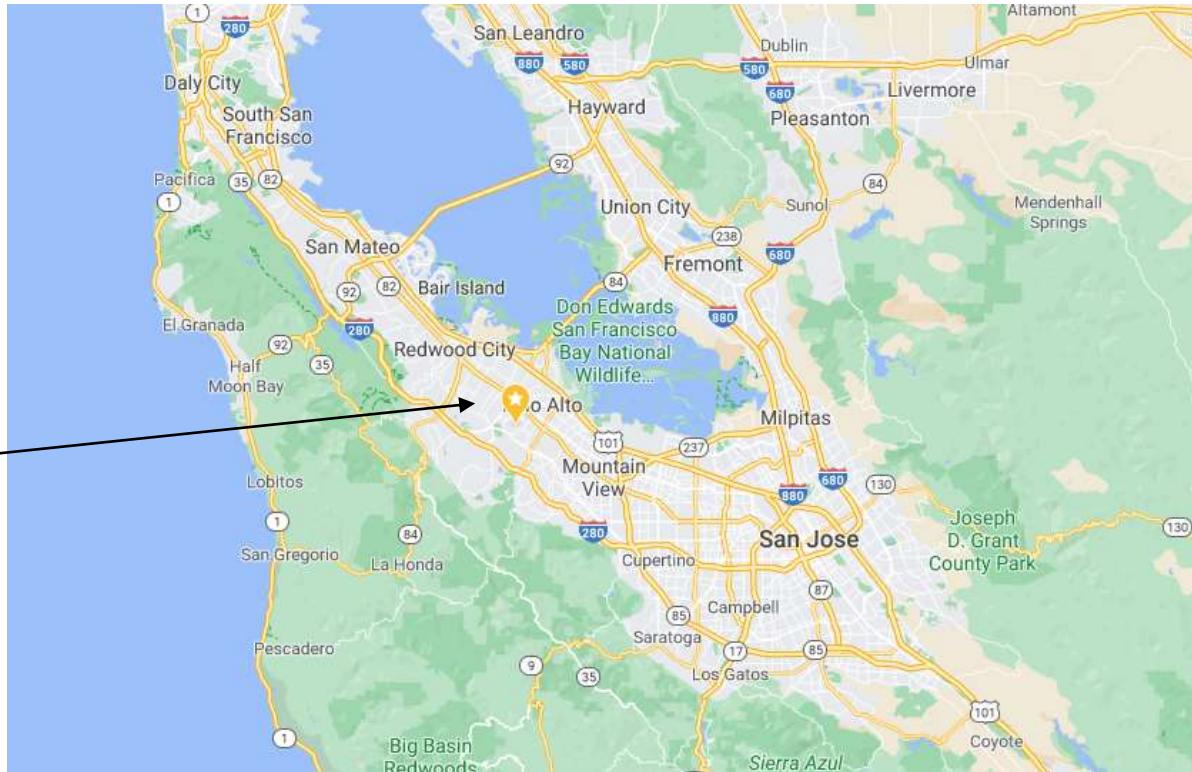


# Software products scenario

# Software product revolution started in Silicon valley



Stanford University



## Silicon valley

Early companies in Silicon valley: HP, Xerox, Apple, Oracle,.....

# How Silicon Valley became successful?

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- Convergence of Academia (Stanford, UC Berkley), the Private Sector, and Government
  - High Density of Wealthy Investors and Funding Institutions
  - Inspiration From Past Success Stories
  - Cultural diversity: Half the startups belong to Indians and Chinese
  - Level-headed Approach to Failure
-

# Today there are 950+ unicorns across the world

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Country	# of Unicorns
United States	300+
China	140+
India	50+
United Kingdom	30+
Germany	12
South Korea	11

<https://www.cbinsights.com/research-unicorn-companies>

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# Unicorns by industry

Industry	# of Unicorns
Fintech	80+
Internet software & services	70+
E-commerce & direct-to-consumer	70+
Artificial intelligence	50+
Mobile & telecommunications	35+
Health	35+

<https://www.cbinsights.com/research-unicorn-companies>

# Growth of start-ups in India

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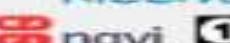
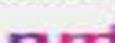
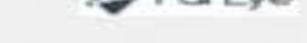
The number of start-ups has grown from 7,000 in 2008 to 50,000 in 2017, according to the latest report by [\*\*KPMG on the startup ecosystem in india\*\*](#)

KPMG report: <https://home.kpmg/in/en/home/insights/2019/01/startup-landscape-ecosystem-growing-mature.html>

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# India's Next Batch Of Unicorns And Their Sectors

2021  
IN REVIEW

SECTOR	SOONICORNS
Fintech	                   
Ecommerce	           
Enterprise Tech	      
Consumer Services	    
Logistics	    

# Upcoming unicorns startups in India

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India has 73 potential unicorns in 2021, up from 52 soonicorns in 2020, with Bengaluru leading the list followed by Mumbai and Delhi-NCR

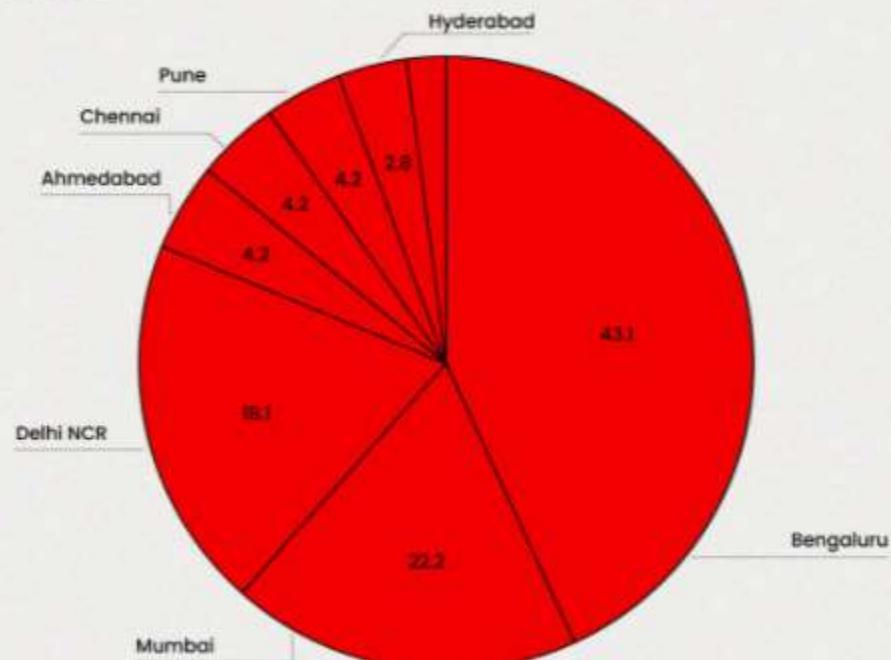
The emergence of new models in fintech, consumer services and ecommerce has revitalised funding in these sectors

As startups raise capital at high valuations, investors caution against short-term thinking around growth at the cost of unit economics

<https://inc42.com/features/the-next-unicorns-soonicorn-startups-in-india/>

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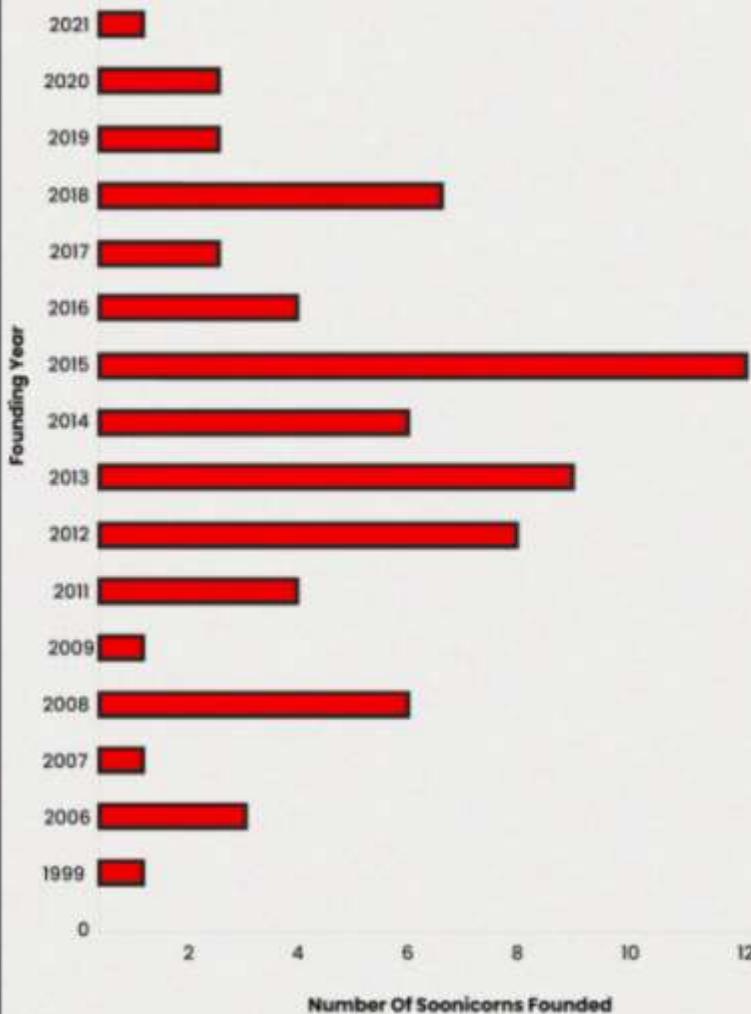
## The Soonicorn Startup Hubs Of India

2021  
IN REVIEW

Source: Inc42 Plus

Inc42

## Most Of India's 2021 Soonicorn Batch Was Founded After 2014



Source: Inc42 Plus

Inc42

# Tech start-ups growth in India

## Startup base

### Total tech-startups in India



- 5,000-5,200 total tech-startups in 2017
  - 7 per cent growth y-o-y
- 1,000 new tech-startups added in 2017
  - 29 per cent decline y-o-y

KPMG report: <https://home.kpmg/in/en/home/insights/2019/01/startup-landscape-ecosystem-growing-mature.html>

# Tech start-ups – Advanced technology (India)



## Advanced technology startups

- 15 per cent advanced technology startups (such as analytics, artificial intelligence, Internet of Things (IoT), etc
- 18 per cent software as a services (SaaS) startups in the overall startup base



# Tech start-ups – job creation (India)



## Job creation

- 100k – 105k people employed by startups
  - An increase of 5 per cent y-o-y



# What is spurring product industry?

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- Global market reach
  - Cloud resources – Amazon AWS, Microsoft Azure, IBM, Google
  - Funding - 100 angel investors in 2020
  - Talent pool
-



# Unicorns in India

Courtesy: <https://www.investindia.gov.in/indian-unicorn-landscape>



# Product categories

# Product categories

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- By industry – Finance, Health, Retail, Travel
  - By technology – AI/ML, Analytics, Robotics, IoT
  - B2B vs B2C
  - SaaS vs On-premise
  - Mobile vs Web
  - Regular vs API products (Payment gateway, Google Maps, SMS gateway, Banking API)
  - Product vs Product-cum-service (Ola, Uber, Flipkart)
  - Product (Paytm), Product platform (Ola), Product family (Office on Windows, Office on Mac, Office on Android), Product Line (Rockwell Collin avionics)
  - **Any other?**
-

# Industry segments

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- E-Commerce – Amazon, Flipkart
  - HealthTech – Practo, Tata Health, CogniAble
  - FinTech – Paytm, Wealthy
  - EdTech - Byju
  - TravelTech – MakeMyTrip, Tripadvisor
  - Logistics – Ecom express, Dunzo, Delhivery
  - Consumer services – Swiggy,
  - Enterprise Tech – Zoho, Kissflow, Wooqer
  - Deep tech - Niflr, Logically, AskSarkar
  - Software dev – Postman, WorkDuck
-

# Product platform

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Product platform: Amazon AWS, Android, Uber, PayPal, Facebook

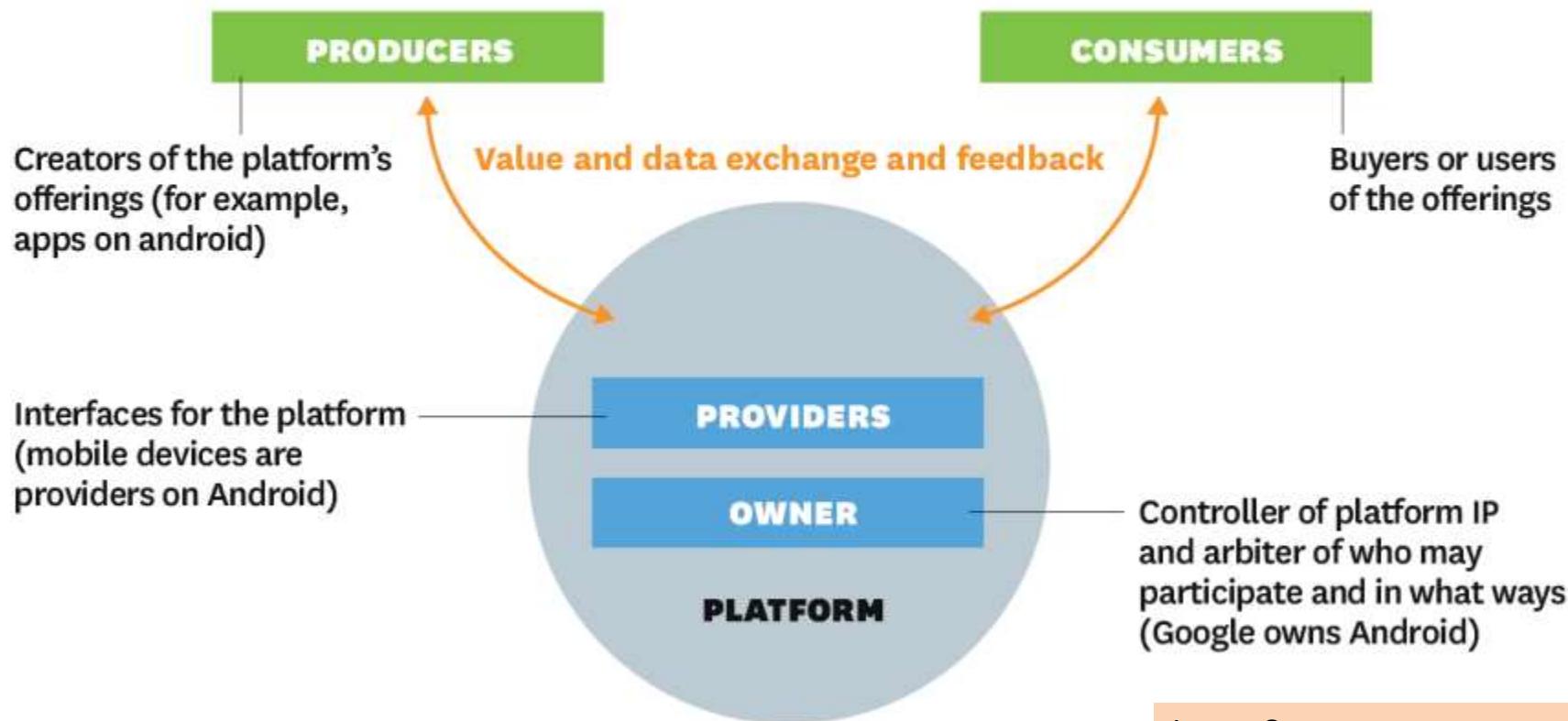
- The technical foundation / eco system on which several software products are based.
-

# Product platform



## The Players in a Platform Ecosystem

A platform provides the infrastructure and rules for a marketplace that brings together producers and consumers. The players in the ecosystem fill four main roles but may shift rapidly from one role to another. Understanding the relationships both within and outside the ecosystem is central to platform strategy.



SOURCE MARSHALL W. VAN ALSTYNE, GEOFFREY G. PARKER, AND SANGEET PAUL CHOUDARY FROM "PIPELINES, PLATFORMS, AND THE NEW RULES OF STRATEGY," APRIL 2016

Image Source:  
<https://hbr.org/2016/04/pipelines-platforms-and-the-new-rules-of-strategy>

# Product family

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Product family: Microsoft Office (Word, Excel, PowerPoint, OneNote, Outlook)

- A group of software products that are marketed as belonging together under a common family name
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# Product line

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Product line: Rockwell Collins Avionics systems for different helicopters

- a collection of similar software systems from a shared set of software assets using a common means of production.



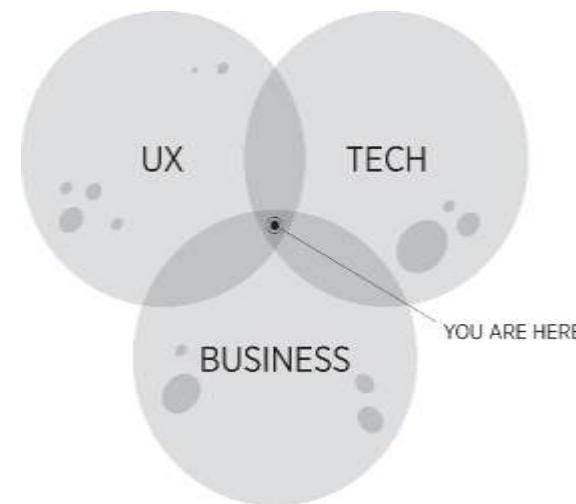
# Product business and Project business

Dimension	Product	Project
Risk	High	Low
Returns	High	Low
Duration	Ongoing	Pre-determined
Customers	Many	One
Objective	Discovered	Given
Funding	Internal & external	Internal
Marketing effort	High	Low
Management	Strategic	Tactical / operational

# What is Product Management?



- “The job of a product manager is to discover a product that is valuable, usable and feasible.” – Marty Cagan, Author of ‘Inspired’
- “Product management is an intersection between business, user experience, and technology” – Martin Eriksson, Author of Product Leadership



- “Product management is the glue that holds together all the various functions” - Ken Norton, Product Partner at Google Ventures

# Product Management role

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- You need to be really good at strategy, be inspirational, and understand the long-term picture.
  - At the same time, you have to be really good at the operational side and making things happen
    - Setting a vision
    - Creating a roadmap
    - Build the product
    - Talk to customers
  - You need the soft skills of persuasion, negotiation, storytelling, vision setting and communication
-

# Product Management role



# About the course

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Hope you have handout.





# Sharing thoughts

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Name one product company you admire.

What is the reason you admire this company?

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# Appendix

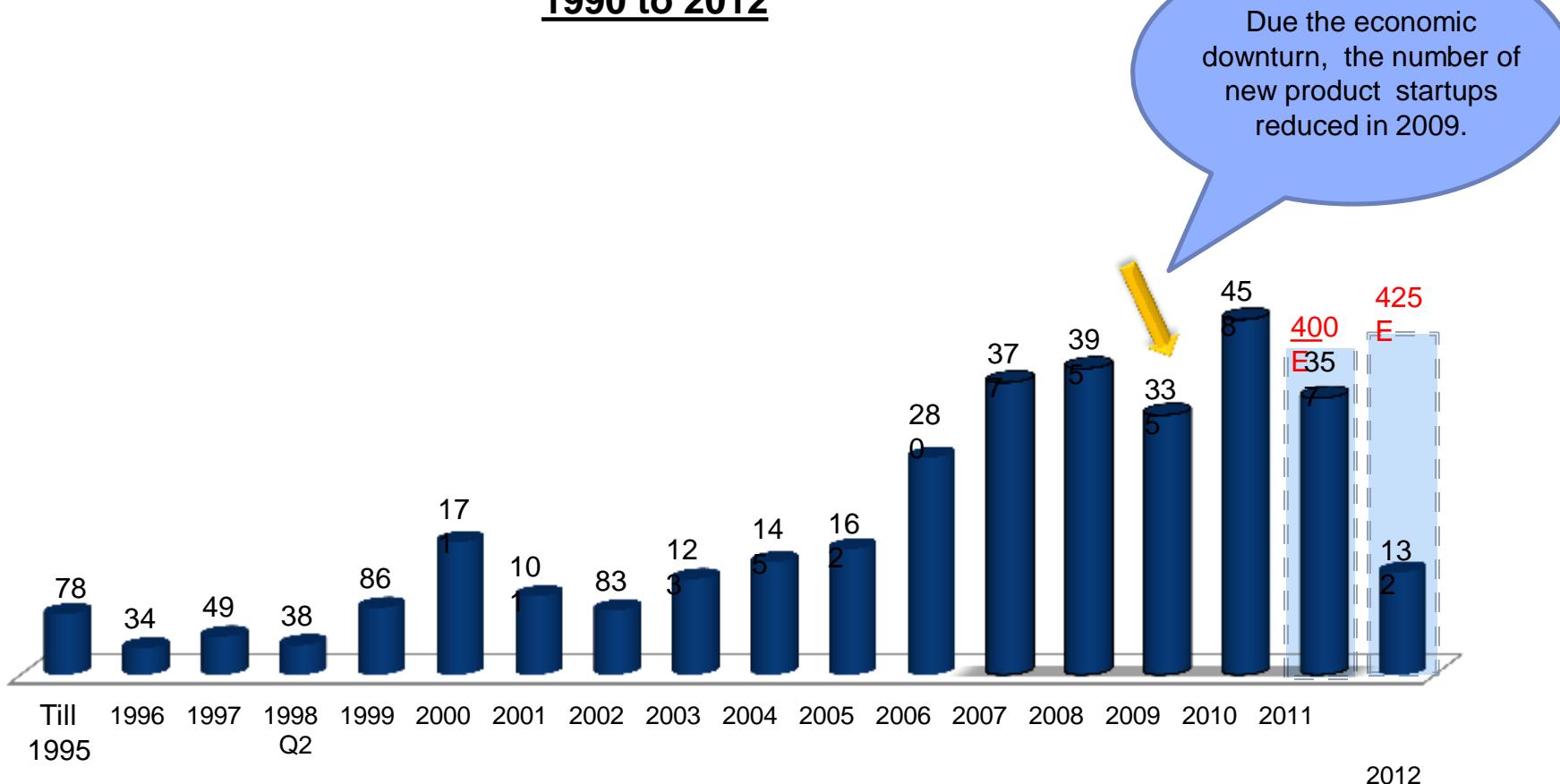
# Examples of Products

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- Zoom – Simplified Cisco Webex
  - Ola – Built a platform
  - Postman – Eco system for API development
  - Slack – Simplified Team collaboration
  - Twilio – Tool to Integrate messaging
  - Kissflow – Business workflow implementation easily
  - Rivigo – Innovation in logistics
  - MyGate – Spotted an opportunity
-

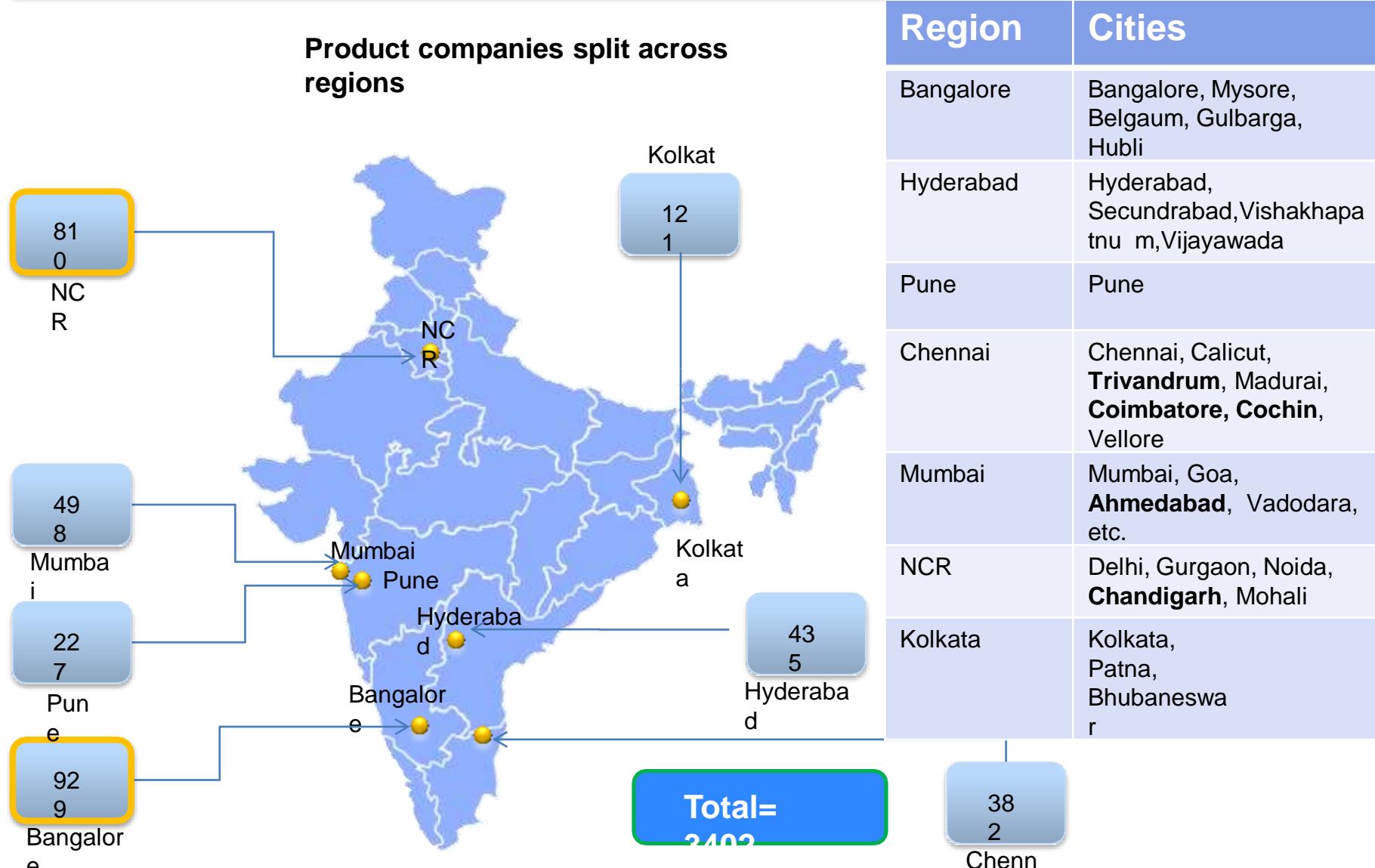
Since 1990, more than 3402 product companies have started in India; however, the YoY numbers vary dramatically due to various other economic variables

### Evolution of the Indian Product Business Landscape from the year 1990 to 2012



Total= 3402

Of the total 3,402 product companies, approximately 51 percent are based in Bangalore and NCR region

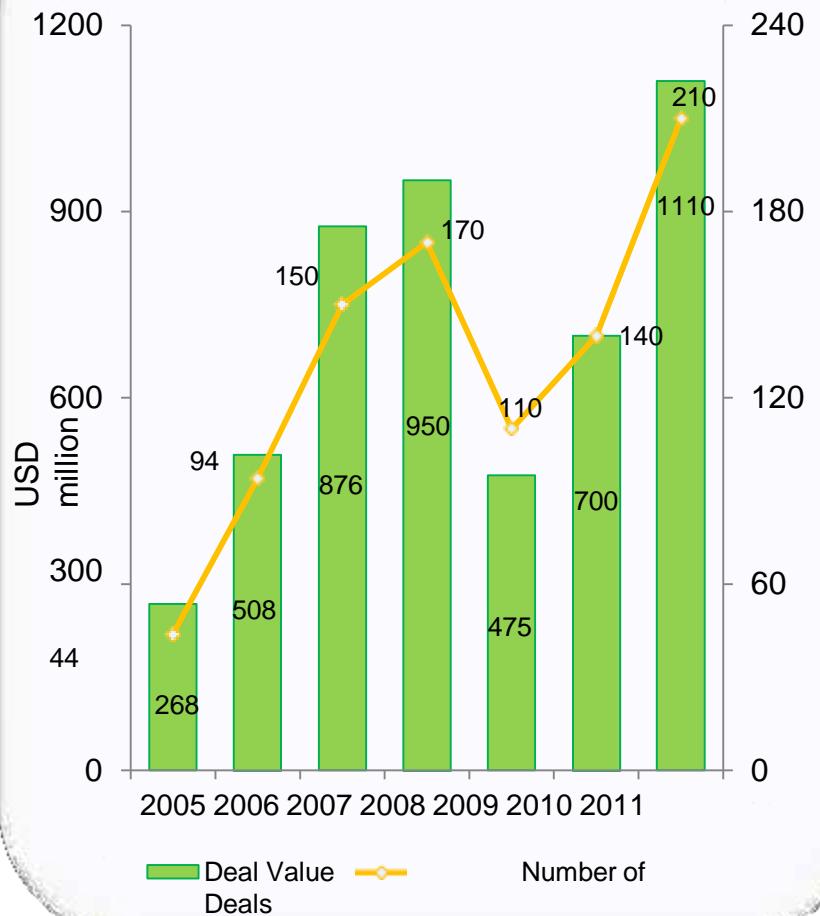


**Note:** The cities marked in **bold** are emerging Tier-II cities for product startups

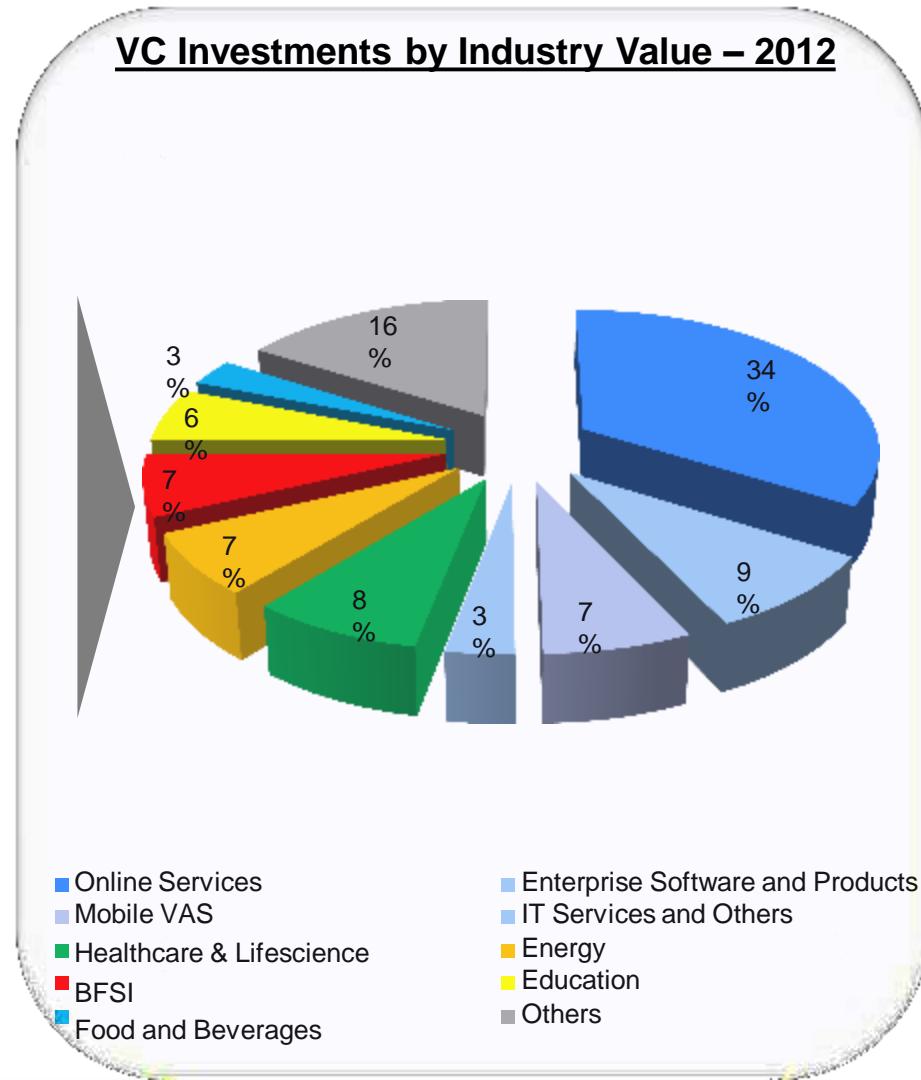
# Obtaining funding has proved to be a challenge; however, this is changing as VC investments in this space are rising



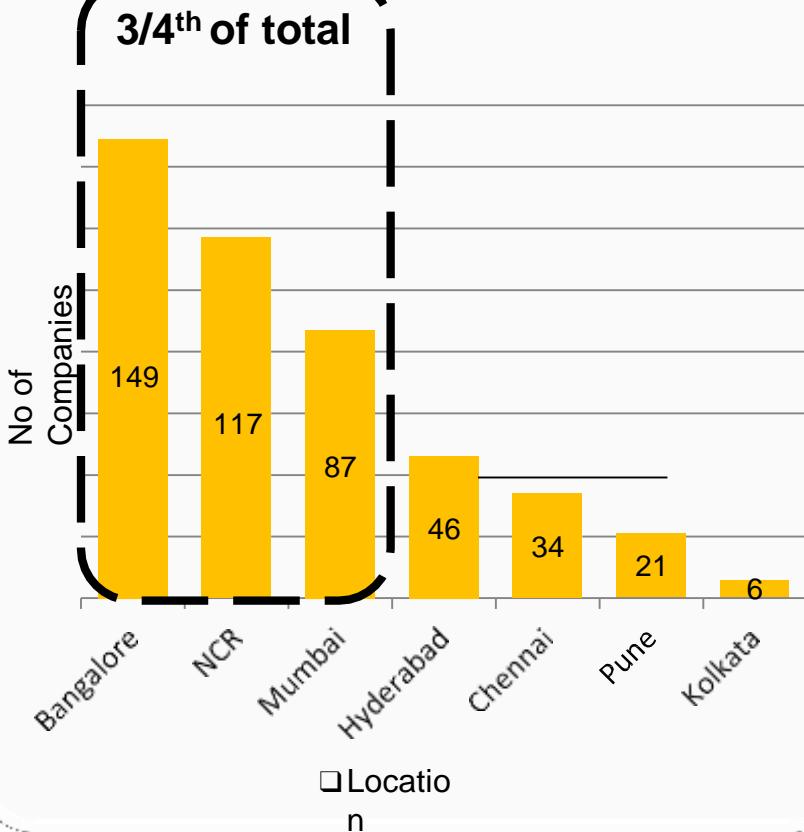
VC Investments in India (2005 – 2011)



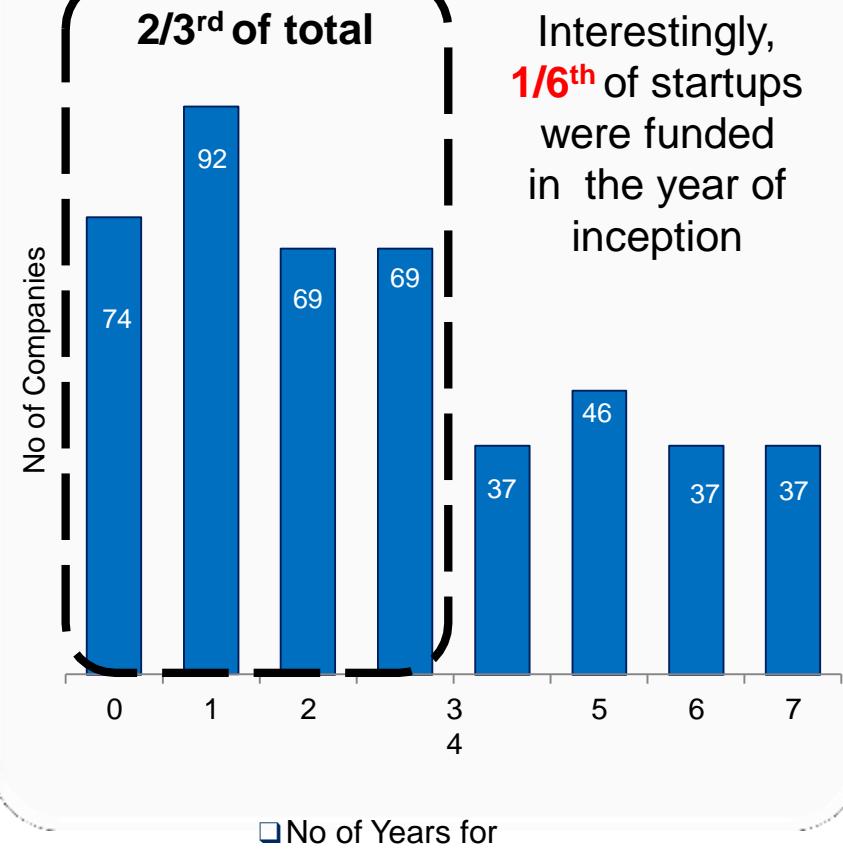
VC Investments by Industry Value – 2012



VC Investments by companies Location (2005-2012)



Funding timeframe for 2005-2012 companies

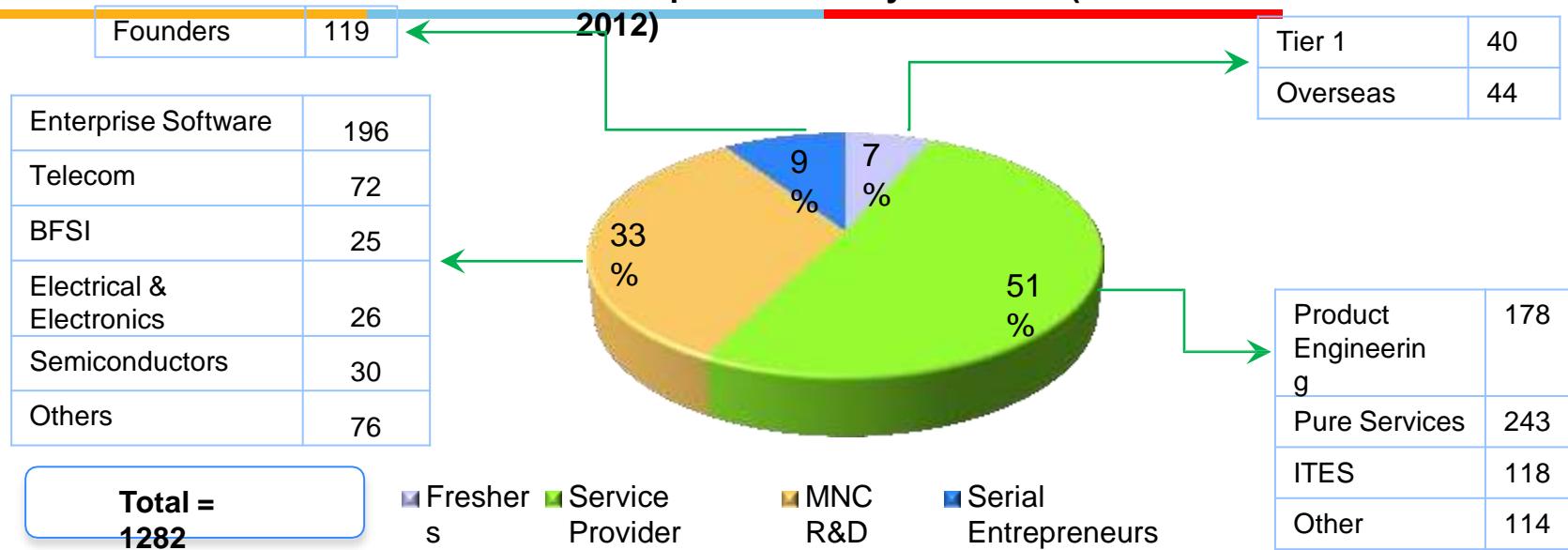


- Overall funded companies from (2005-2012) are around 446 (i.e. 19 % of 2407 startups)
- Around 66% of the companies obtained funding within 3 years of inception
- 69% of the companies which obtained funding during (2005-2012) are from Digital and Software

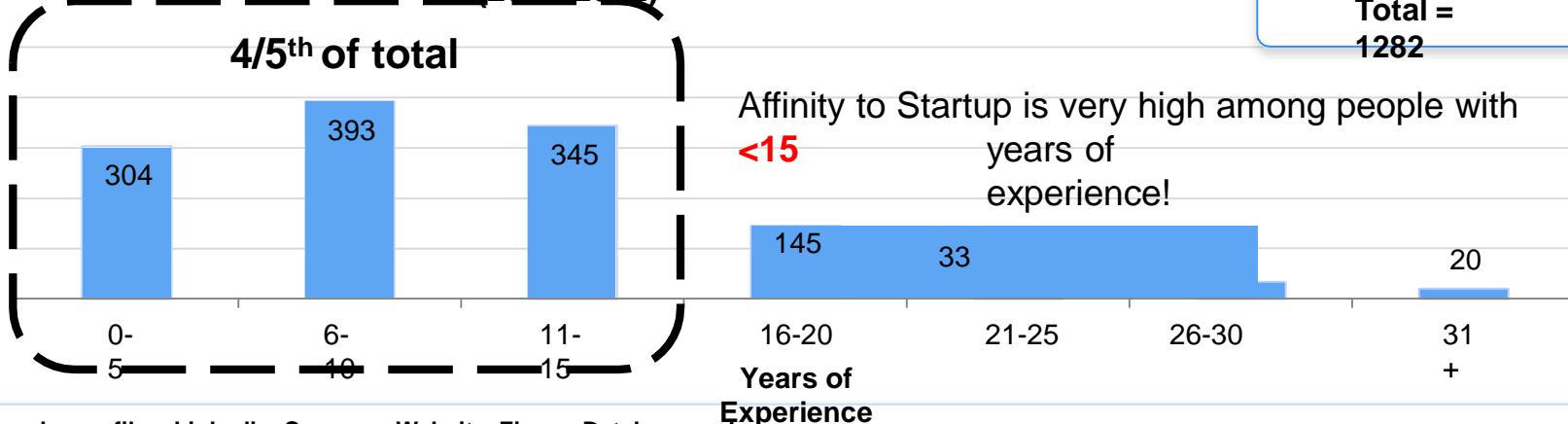
It is noticed that between 2009-12 more than 55% of the startup founders have less than 10 years of experience



### Startup Founder's by Domain – (2009-2012)



### Startup Founder's by Experience – (2009-2012)





# Software product management

## Overview

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# Contents

- Evolution of product organizations
- Why products fail?
- What do best product teams do?
- Product management: Relationship with rest of the company
- Product Lifecycle
- Technology adoption lifecycle
- Journey of some product companies
- Multi-faceted role of a Product manager

# Evolution of product organizations

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A product organization goes through the following stages:

- Startup
- Growth stage
- Enterprise

Let us see what are the characteristics of each stage...

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# Startup stage

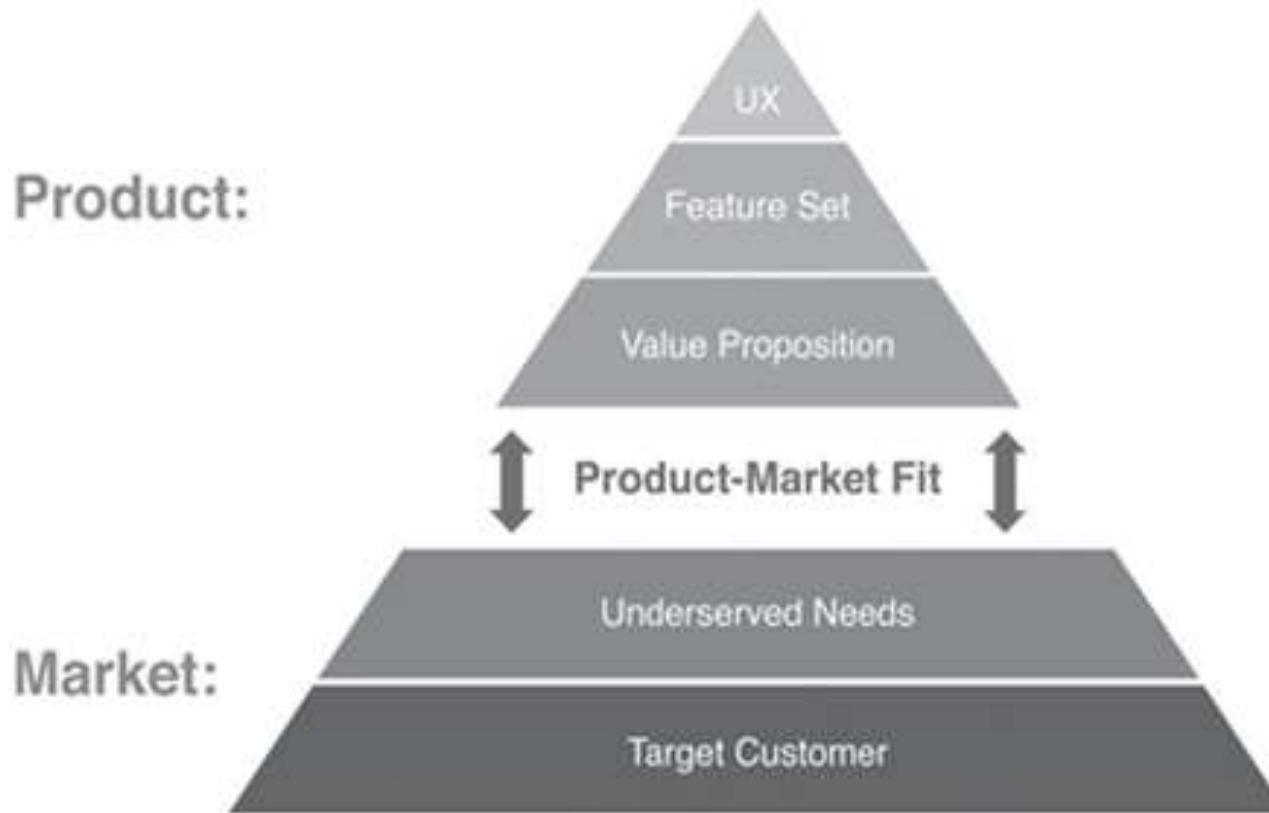
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- Trying to achieve product-market fit,
- Limited funding,
- Learns quickly
- Little bureaucracy,
- Many fail,
- Those that succeed are good at product discovery,
- Risky but rewarding if things go well.

Examples: WhiteHat Jr, Simpl

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# Product-Market fit concept



# Startup stage examples

## WhiteHat Jr

- Founded in 2018
- Offers coding & AI courses to children aged 6 to 14 years.
- Aims to empower children to become creators
- BYJU's acquired it for \$300 million



## Simpl

- Started 2016
- Online payment method that allows a consumer to buy now and pay later
- Digitalizing the old Khata system of payment to grocer, milkman, etc
- Simpl under-writes customer payments based on machine learning
- USP: Transparent financial services and single click payment



# Growth stage

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- Scale up – more customers
  - Replicate earlier successes with new, adjacent products and services – MakeMyTrip flight, train, hotel
  - Technology infrastructure is stretched (Netflix during the growth stage)
  - There is technical debt (Amazon monolithic to microservices)
  - Goes for IPO or gets sold (MakeMyTrip IPO, WhatsApp sold to Facebook)
  
  - Examples: Bounce (2016), Postman (2014), KissFlow (2013).
-

# Growth stage example

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## Kissflow

- Business Process management software
  - Self-service setup / configuration
  - 50 process templates to choose from – employee on-boarding, travel reimbursement
  - Strong after sales support
  - Product led growth - leading to pull rather than push
  - 10,000-plus clients, including biggies like Airbus, Danone, Michelin and Pepsi
  - Competitors - Pega, Appian, Outsystems
  - 200 employees
-

# Enterprise stage

- Focus is on consistent product innovation, stay ahead
- But many companies are satisfied with leveraging the value created and brand created, leading to slow death (ex. Kodak)
- They work hard to protect what they have created and less on new ventures & initiatives
- There is lack of vision, increased bureaucracy, resorts to acquisitions or creating separate innovation centers to incubate new business or products (example Cisco).
  
- Companies that failed to innovate: Xerox, AOL, Motorola
- Strong enterprise companies: Adobe, Amazon, Apple, Facebook, Google, and Netflix

# Enterprise stage: Examples of consistent innovation



Netflix	Amazon	Facebook
<ul style="list-style-type: none"><li>• DVD movie sales</li><li>• DVD rentals</li><li>• Online booking of DVD, delivered via Post</li><li>• Streaming video</li><li>• In house production of serials and movies</li><li>• Movie / Serial Award function (akin to Oscar)</li></ul>	<ul style="list-style-type: none"><li>• Books</li><li>• Electronics, Others</li><li>• Recommendation feature</li><li>• Amazon Prime</li><li>• Alexa</li><li>• Kindle</li><li>• AWS</li><li>• Firestick</li><li>• Amazon Pay</li></ul>	<ul style="list-style-type: none"><li>• Wall &amp; messaging</li><li>• News Feed - streams friend's activity</li><li>• Sell stuff to other Facebookers</li><li>• Tagging and attachments</li><li>• 'Like' button</li><li>• Timeline feature</li><li>• Buys Instagram, WhatsApp</li></ul>

# Why products fail?

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- Most companies start with ideas generated internally or got from existing or potential customers.
    - Example: HP's AI-enabling technology on a low-cost, general-purpose workstation developed by Marty Cagan & team (1980s), DB designer – I worked on (1989)
  - Based on these ideas they create a business case, roadmap, build the product and deploy
  - It is then that they realize that there are no takers
  - More examples of failed products:
    - Apple Watch Gold edition
    - Google+ social media
    - The Daily - Digital newspaper in collaboration with Apple
-

# What do best product teams do?



- Tackle risks early
- Define and design products collaboratively – PM, Designer, Engineering
- Solve problems, not just implement features

# Tackle risks early

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There are 4 types of risks:

- Value – Does customer find value in the product
  - Usability – Is the product easy to use
  - Feasibility – Is the product technically feasible to build
  - Viability - Will the business be viable, can we break even
-

# Tackle risks early - Example

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Bounce, AirBnB, Slack

- Bounce spotted an opportunity in Bangalore: Provide scooter to reach the nearest metro station
  - Bounce experimented their concept with a few scooters to determine value. Once the demand / value was established, they expanded
  - AirBnB rented their house to test value. A conference was being held in their city and people would be looking for accommodation
  - Slack requested friends and cajoled 6-10 companies, to use their product and give feedback to determine usefulness / value and usability and improved the product based on user feedback.
-

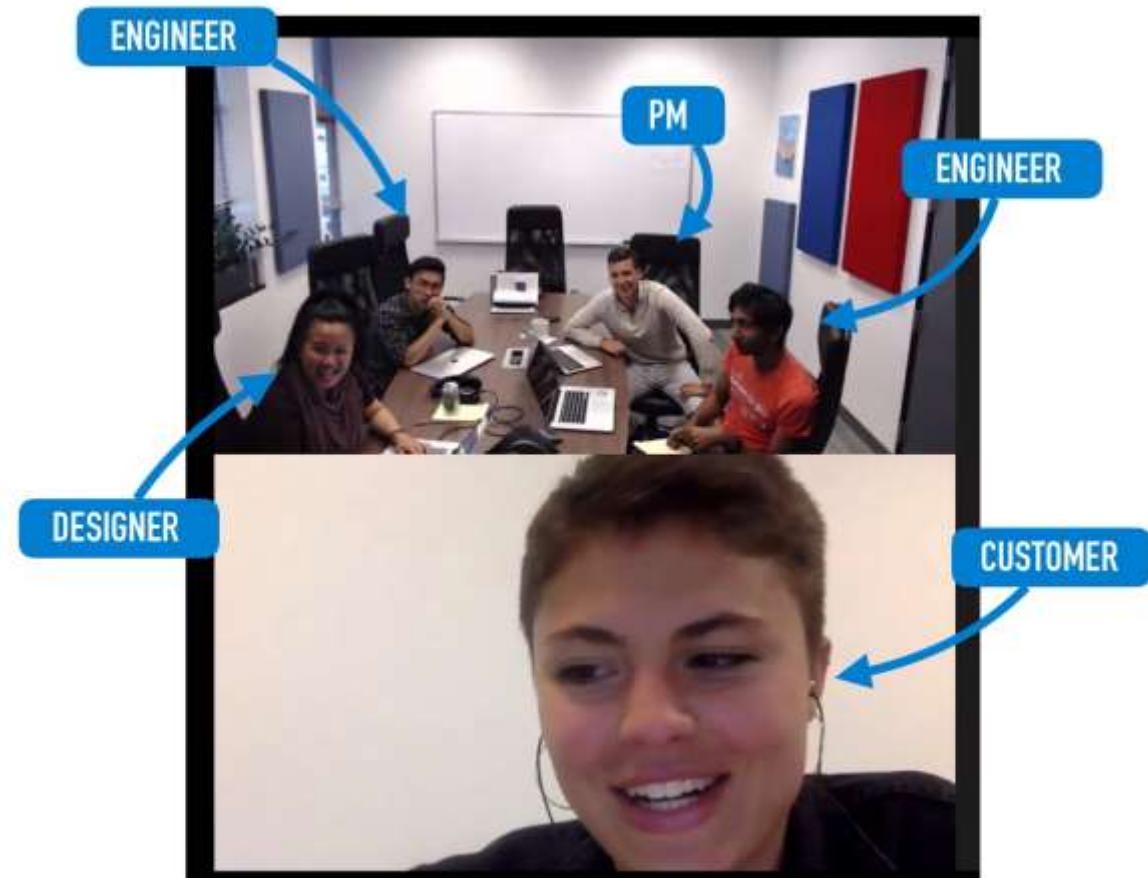
# Define and design products collaboratively



- Product, design & engineering work side by side in a give-and-take manner
- Leads to better solution ideas & higher ownership

## Example: Amplitude

- A product analytics s/w
- Engineers stay connected with customers by participating in client calls



# Solve problems, not just implement features

---



Example: Kissflow

- Workflow automation improves employee productivity
  - Provides 50 ready-to-use workflows from travel reimbursements to employee on-boarding
  - Easy diagramming helps model a company's process just as it appears in the business manager's mind.
-

# Solve problems, not just implement features

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Example: Wobot Intelligence

- Helps organizations in the Food, Retail, and Manufacturing sectors to reduce risk of non-compliance & pilferage
  - Has process compliance modules like hygiene, workforce & workplace safety, customer SOPs, and more
  - Uses deep learning Video Analytics to identify people, objects and their activities
  - Customers - IRCTC, Rebel Foods, CureFit, Kitopi, Travel Food Services, Burger Singh, G4S, Max Estates, Blue Tokai, Apparel Group and Smartworks
-

# Solve problems, not just implement features - Example

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Example: Logically

- Detects fake news & inaccurate news using AI & ML
  - Finds out who is spreading misinformation to enable authorities to take action
  - Examples:
    - Detected misinformation during the death of a Bollywood actor Sushant Singh, during conflict with China in Ladakh, and during the Kashmir issue with Pakistan.
    - Detected bots originating in Pakistan that were interfering with geopolitical and sensitive issues within India
  - Customers: Indian Election Commission, Pharma companies to prevent anti-vaccine information, Mysore Police
-

# Product management: Relationship with rest of the company

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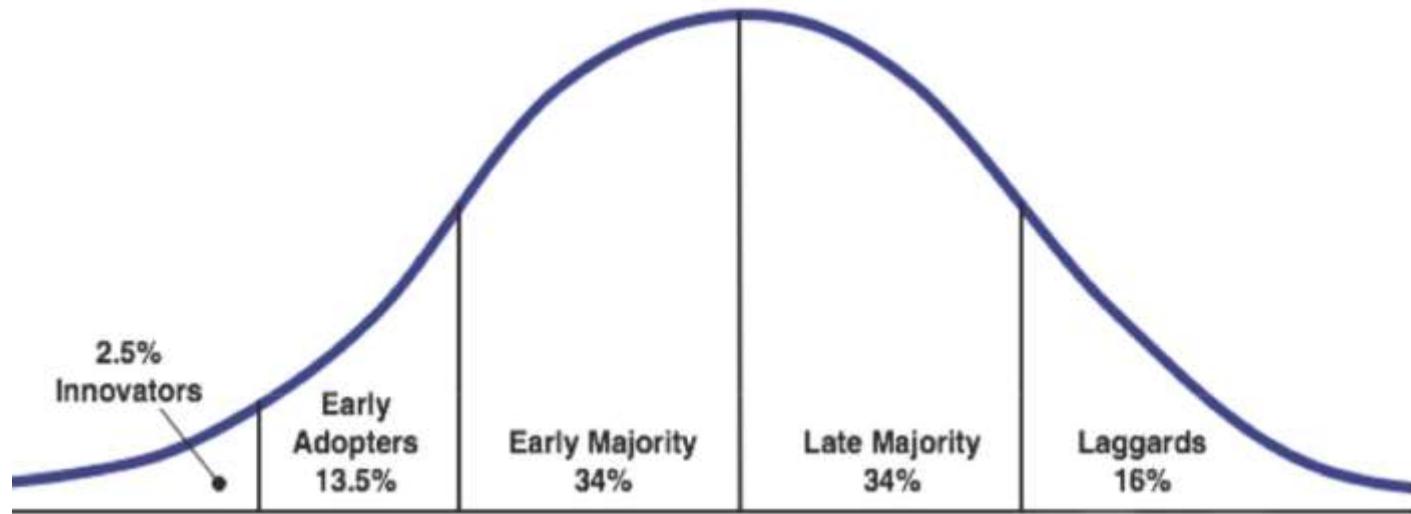
- Development team relies on product management to define a plan and write user stories, requirements, and acceptance
  - Marketing team relies on Product management for product information, value proposition definitions. They collaborate to define product position, launch product, define Go-to-market strategy
  - Sales team relies on Product management for demo cases, answering detailed inquiries, and helping to close deals.
  - Finance and Product rely on each other to build the business through determining pricing, margins, discounting, and so forth.
-

# Product lifecycle

- Determine your target customers
- Identify underserved customer needs
- Define your Value Proposition
- Assess value through customer interaction
- Specify your Minimum Viable Product (MVP)
- Create your MVP prototype
- Test your MVP with customers
- Iterate
- Launch product & support
- Grow & build adjacent products
- End of life

# Technology adoption lifecycle

Products using new technology such as AI, NLP, Blockchain, Robotics are adopted gradually



# Technology adoption lifecycle...



- **Innovators** are the first to get interested on new products and novelties. They even accept incomplete or defective products just for the pleasure of being the first ones to use this new product.
- **Early adopters**, also known as visionaries or enthusiasts, who accept the risks of testing a new product, but not for the pleasure of coming first but **because they see the potential in it**. Usually, they are influencers within organizations and communities in which they participate.
  - IBM Watson was adopted by a [Memorial Sloan–Kettering Cancer Center](#), Cleaveland Clinic, MD Andersen Cancer Center, to get advise on Cancer
- **Early majority**, also called pragmatic, buy new products only after they got references.
  - Manipal Hospital Bangalore, Georgia tech teaching assistant, H&R Block for tax preparation, Several startups use it for developing cognitive apps
- **Late majority** are the conservatives, in other words, those who buy only after the price has dropped substantially. Example late majority users of SalesForce
- **Laggards**, who only buy a new product if this is the only option available.

# Technology adoption lifecycle...

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## Example:

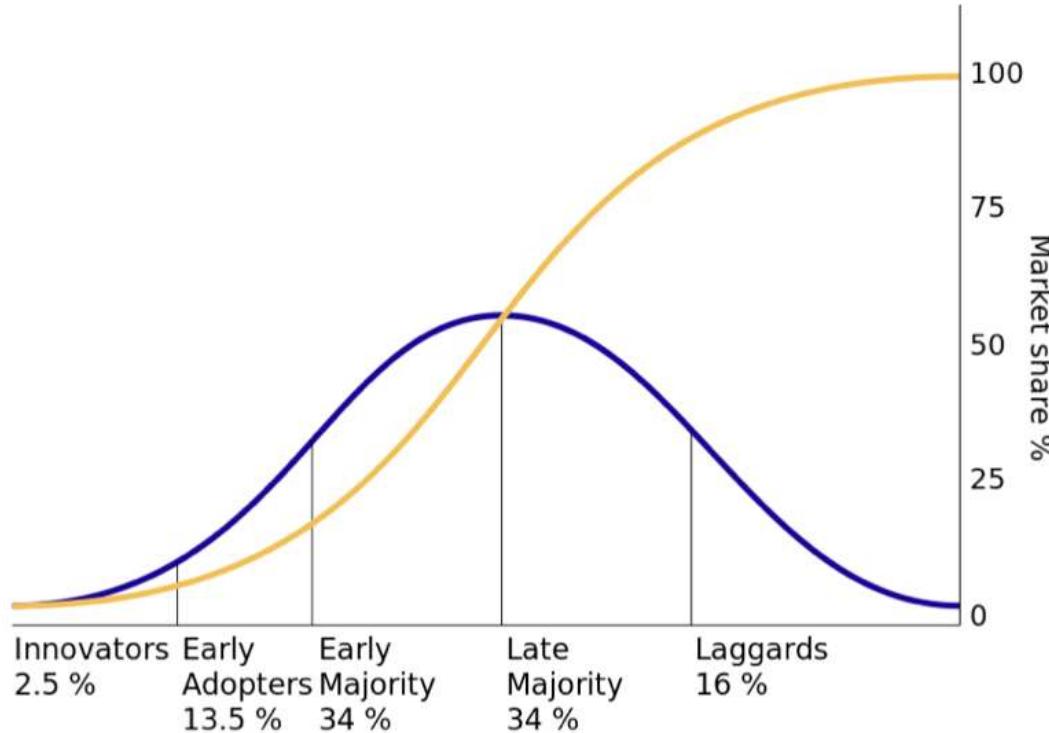
- IBM Watson & Robotic surgery (Da Vinci) used by one or 2 hospitals.
- In 1999 Salesforce.com was the first to use Cloud to offer applications on the Cloud. 3 years later the industry grew massively with video, music and other media being hosted and delivered online.

<https://www.scality.com/solved/the-history-of-cloud-computing/>

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# Technology adoption lifecycle...

**S-curve:** By calculating the integral (who remembers the calculus classes?) we can obtain the famous S-shaped technology adoption curve.



# Multi-faceted role of a Product manager

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- Deep knowledge of customer, your business, market & industry
    - Nium - money transfer to foreign countries
    - Had deep knowledge of money transfer markets in Singapore, Indonesia, Japan, etc.
    - Had good knowledge of forex – how it works, who are the players, banking
  - Engage with customers, understand their business, process, pain points
    - Slack understood the collaboration needs of teams
    - Twilio understood the messaging needs of companies
    - Wobot understood the process compliance needs of food, pharma, retail industries
  - Prioritize ideas, features & projects
    - Slack focused on Search, synchronization, file sharing
  - Collaborate with Design, Engineering, Marketing, Legal, Finance
  - Recruit, Train & develop the product team
  - Manage upward & outward: Tell a story, sell a vision, get funding
  - Align & focus the organization
-

# Journey of some product companies: Exercise

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Study the journey of Netflix and identify:

- Key milestones
  - Challenges faced
  - What they did right and what they did wrong
  - Key Product management learnings
- 
- Courtesy: <https://www.businessmodelsinc.com/exponential-business-model/netflix/>
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# Appendix



# Software product management

## Core concepts

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# Contents

- Principles of product management
- Characteristics of a holistic product
- Product-Market fit
- Problem space vs Solution space
- User vs buyer
- Continuous discovery and delivery
- Product eco-system
- Critical success factors

# Principles of product management

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- Establish compelling value. Examples:
    - MakeMyTrip – a one stop shop for travel,
    - Postman – Make API testing easy
  - Many of our ideas won't work out, and the ones that do will require several iterations. Examples:
    - Slack - Initially they developed a multi-player online game which did not succeed, but the inbuilt messaging feature became successful.
    - MakeMyTrip initially targeted Indian travellers, but was not successful. Later targeted NRIs
  - We must validate our ideas on real users and customers. Examples:
    - Bounce – Validated the 'Rent-a-bike' idea by investing in a few scooters
    - AirBnB – Rented their apartment to conference attendees
  - Validate ideas fast and with minimal cost – the more we delay, we may be expending more effort & cost on an idea that does not have a market.
  - **Have you experienced any of these principles?**
-

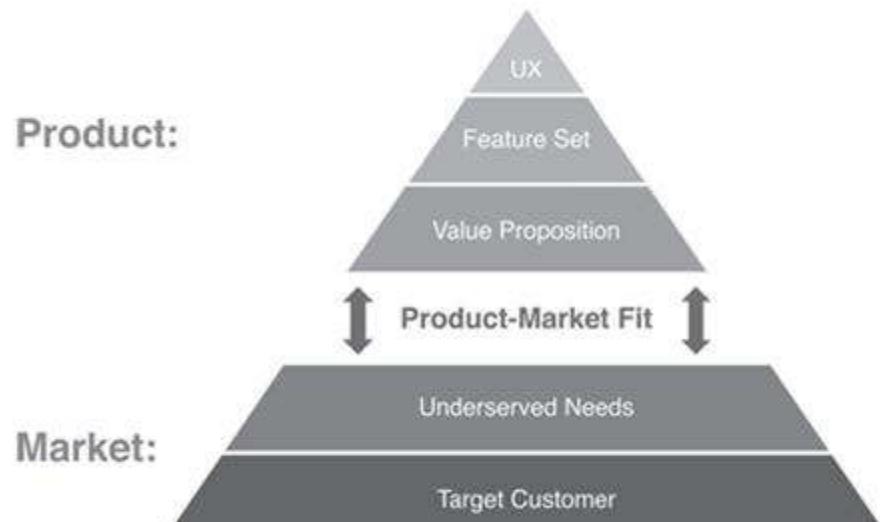
# Different aspects of a product

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- Functionality: Example booking tickets is one function of MakeMyTrip
  - Technology: Example: Microservices architecture used by Amazon, Encryption used by WhatsApp, AI/ML used by Logically
  - User experience: (UX): Example Tally's ease of use for non-finance people
  - How do we monetize?: Example through transaction fee of Payment gateways or subscription fee of SalesForce
  - How we attract & acquire customers? Example: Freemium of Zoom, cash back of Paytm, Search Engine Optimization, Ads
  - Offline experience: Example: Merchandise fulfilment experience and merchandise return experience of Amazon & FlipKart, support experience by call center personnel, self help material on website
-

# Product-Market fit

- It is about how well the product meets the needs of the customer (market)
- Good Product/market fit results in happier customers, lower churn rates, shortened sales cycles, and rapid organic growth. (Inspired)
- You can always feel when product/market fit isn't happening. The customers aren't quite getting value out of the product, word of mouth isn't spreading, usage isn't growing that fast, press reviews are kind of "blah", the sales cycle takes too long, and lots of deals never close.



# Product-Market fit

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- Marc Andreessen coined the term *product-market fit* in a well-known blog post titled “The only thing that matters.”  
([https://pmarchive.com/guide\\_to\\_startups\\_part4.html](https://pmarchive.com/guide_to_startups_part4.html))
- In a great market -- a market with lots of real potential customers -- the market *pulls* product out of the startup. Example
  - eCommerce, EdTech, FinTech
- Conversely, in a terrible market, you can have the best product in the world and an absolutely killer team, and it doesn't matter -- *you're going to fail*. Example:
  - Video conferencing (2007), Iridium satellite phone
  - Do you know of any great product that failed?
- Great products sometimes create huge new markets – examples:
  - Virtual machine by VMWare, smart phone by Apple
  - Any other?
- The only thing that matters is getting to product/market fit.

# Problem space vs Solution space

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- Problem space consists of customer needs and pain points.
  - However problems are not always easy to know:
    - Customers express their needs in terms of existing solutions.
    - For example they say “I need a cab in 5 minutes”, because they think cab is the only solution
    - The real need is to go from A to B.
  - There can be many solutions for this:
    - Hire a cab,
    - Use self-driving scooter or car,
    - Hail a bike taxi.
    - Any other?
  - Therefore before finding a solution, we need to understand the real need / problem
    - Understand what customer needs and why
    - Observe what he does, why he does it, etc. (Persona)
    - “If I had only one hour to solve a problem, I would spend up to two-thirds of that hour in attempting to define what the problem is.”
-

# Problem space vs Solution space...

---



What differentiates one product from another is the quality of solution. Examples:

- Space pen: Need is to write in space. US designed an ink pen that works in zero gravity. Russians used a simple pencil
  - Progressive auto insurance: Customer wanted quick settlement of car insurance claim. A process that took 6-7 days was cut down to 1 day through innovative solution
  - MoveWorks: Users need quick IT support to install say a Project management software. Solutions can be: Raise a ticket, Call IT support, Use MoveWorks bot which will check your eligibility and download the sw & install it instantly
  - Application maintenance service: Is faster problem resolution the need or zero problem the need
  - **Any other example?**
-

# Problem space vs Solution space: Case study



## Rivigo case

- What did the founders do to discover the problem?
- What was the real problem?
- How did they solve the problem?



Rivigo story

# User vs Buyer

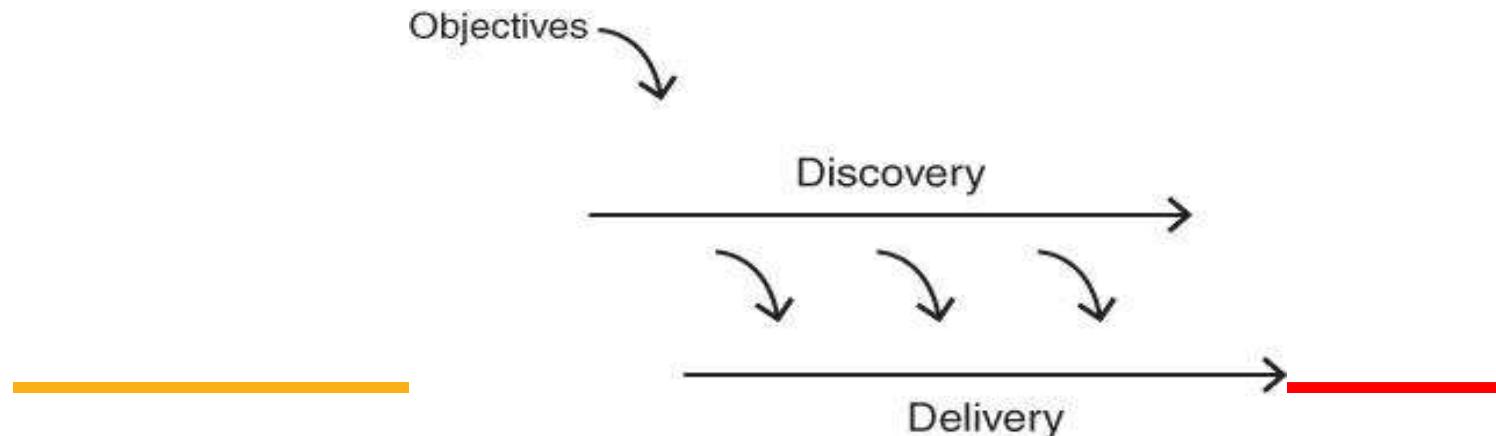
---

- In large enterprises the decision makers are not the end users
  - Decision makers are usually VP and SVP. They want to solve a business problem / pain point.
  - Their concerns are functionality that brings business value (increase customer satisfaction, customer growth, reduce customer churn), productivity, security, reliability / stability / quality of solution
  - The end users typically do not have the power to approve the product. But ultimately they are the ones who are going to use the product. Hence it needs to be user friendly, efficient in performing their functions.
  - Example
    - Lotus Notes: It was a very secure team database and Email system. But not very user-friendly.
    - Cisco WebEx – very reliable but not very user friendly. But corporates prefer it.
    - Do you know of any other examples?
  - But this is changing with SaaS product. Management is becoming more aware of UI / UX
-

# Continuous discovery and delivery



- Discovery and delivery are our two main activities on a cross-functional product team, and they are both typically ongoing and in parallel.
- We are always working in parallel - to both *discover* the necessary product to be built—which is primarily what the product manager and designer work on every day—while the engineers work to *deliver* production-quality product.
- The engineers are also helping daily in discovery (and many of the best innovations come from that participation, so this is not a minor point), and the product manager and designer are also helping daily on delivery (mainly to clarify intended behavior). But this is what's going on at a high level.
- Example Postman, Slack
- Does this happen in your product company?



# Product eco-system

---

Product should address the total customer experience (the whole offer)

- Kaagaz & MS Office Lens (document scanner app on mobile) does not only scan but allows us to share the image via email, WhatsApp etc. Because the customer is not just interested in scanning and storing, he wants to share with others
  - Xerox started with photo copying facility but soon realized people need to staple the pages, need cover page in different colour, etc. So they enhanced the machine to address the total customer experience
  - Clarify: customer support software that involves tracking customer interaction, product details, knowledge base, workflows
  - No Broker.com: Find house, pay advance, get painter, get packer & mover
  
  - Have you come across other products that address total customer experience?
-

# Product eco-system

## Creating Partnerships & alliances

- Xerox tied up with paper manufacturers to ensure steady supply of paper
- SAP partners: DataXstream for POS solutions, DocuSign for eSignature integration with SAP
- Netflix tied up with telecom service providers such as Verizon, Airtel to host their content at ISP gateways, so as to ensure fast response time to customers
- MakeMyTrip built alliances with Airlines, hotels, etc.
- Any other examples you have come across?

# Critical success factors

- Differentiation
  - Intuit – UI and features
  - Apple – UX
  - Citibank – Reliability & infrastructure
  - .Net – Ease of use
  - Toyota – Quality
  - ISRO – low cost satellite launches for world-wide customers
  -
- Entry barrier
  - Google Earth – Entry barrier due to technology
  - Da Vinci Robotic surgery – Technology
  - Microsoft HoloLens – Mixed reality technology for doctors, etc

# Case study

Twilio & Byju's

- What concepts are illustrated by these cases?



Twilio



Byjus

# Case study...

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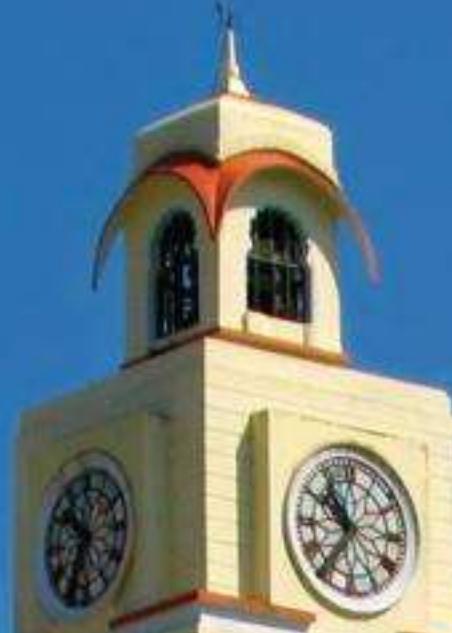
- User vs Buyer, Continuous discovery, Critical success factors, Customer acquisition
- Twilio
  - User vs Buyer: Developer vs Org,
  - Continuous discovery & delivery: SMS, email, Call center,
  - Critical success factors: easy to use, even finance person can code this
- Byju's
  - User vs Buyer: Child vs parent
  - Customer acquisition - freemium model
  - Critical success factor:
    - Focus on learning to think rather than spoon feeding
    - Making it interesting and making children addictive



# Appendix



**BITS Pilani**



# **Software product management**

**Product process: Identify  
opportunity**

Nandagopal Govindan

# Contents

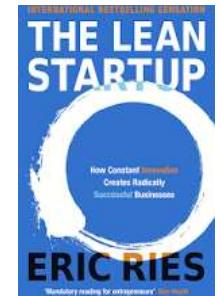
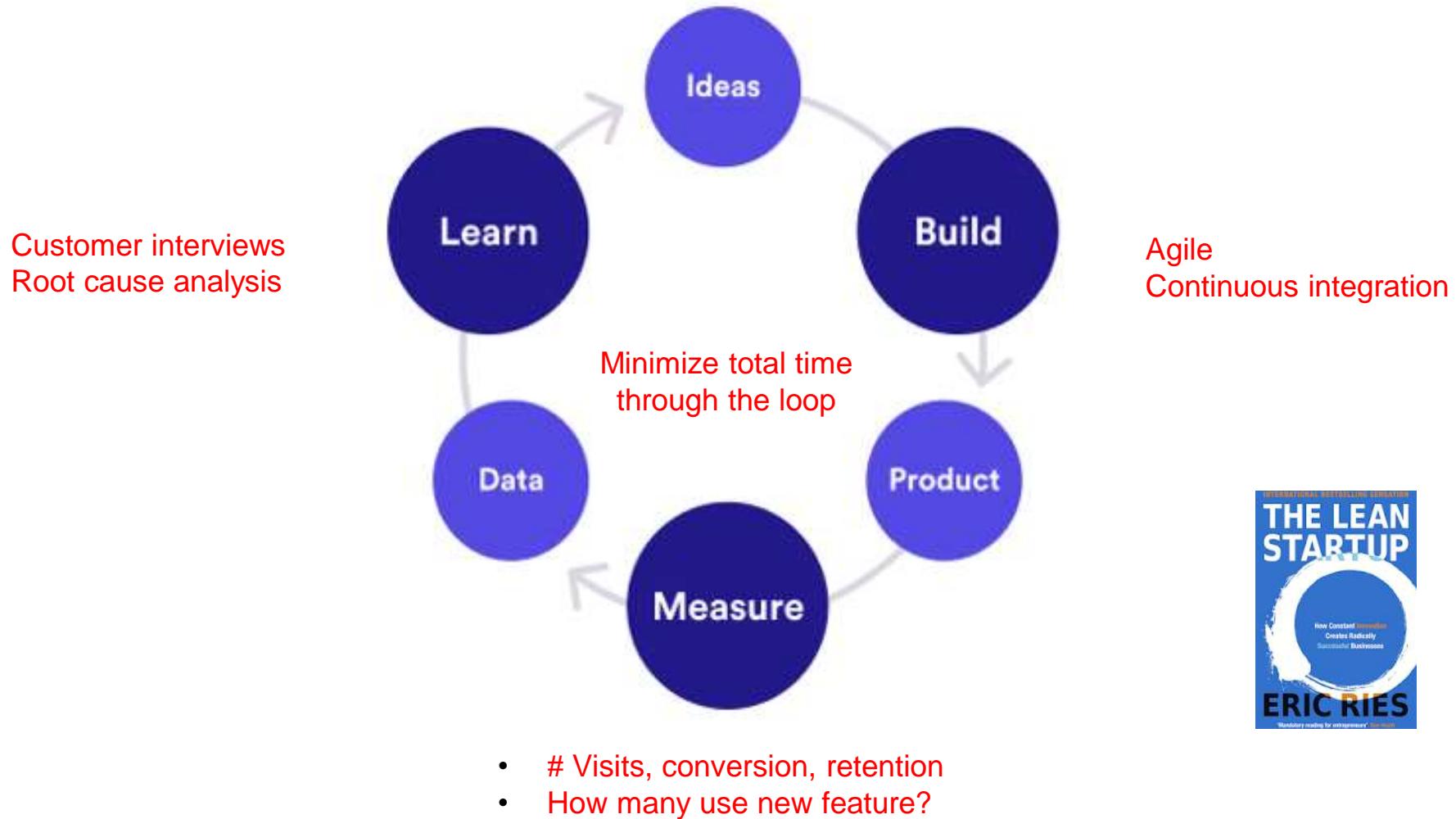
- 
- Overview of product process
  - Identifying opportunity
-



# Overview of product process

- Identify opportunity
- Assess the opportunity
- Create business plan
- Specify product features
- Specify Minimum Viable Product (MVP) feature set
- Test your MVP
- Iterate & Pivot to improve product-market fit

# Build-Measure-Learn cycle



# Identify opportunity

---

- Identify underserved customer needs (LPP)
  - Sources of innovation ([Peter Drucker](#))
  - Hack days (Inspired)
  - Ideation techniques (Cooper & Edgett) (SPM book)
- 
- Case study: DBS Bank
  - Case study: Innovation ideas from ID Foods - Mustafa
-

# Identifying underserved needs

---

- Observe
  - Experience
  - Fortune at the bottom of the Pyramid – CK Prahlad
  - Desire to do social good can find new opportunities
-

# Observe

---

- Toyota Sienna
  - The car was successful in Japan
  - Toyota wanted to understand the specific needs of US market
  - A senior manager spent several months driving 70,000 miles across length & breadth of US observing how people use cars
  - In US children sit in the backside of the mini van
  - So changes were made to make the back seats more comfortable, safe, etc.
  - When it was launched the car became a big hit



# Observe

---

- Oyo: Economy hotels were not clean, lacked basic amenities, etc.
  - Sketch: Observed that Photoshop was not easy to use
  - Slack: Collaboration between teams was clumsy
  - Spotify: People wanted to listen to music legally when illegal music sharing sites were banned
-

# Experience

---

- Ola cabs: Founder was travelling in a cab and cab driver demanded exorbitant amount to change the destination
  - DropBox: Founder kept forgetting to carry files in pen drive
  - Tally: Experienced that existing accounting packages had a User interface that catered to accounts / finance professional. But not to non-finance folks
-

# Opportunities are in plenty at the bottom of the Pyramid



- Opportunities are aplenty if look at the right market
- CK Prahlad wrote a book 'Fortune at the bottom of the Pyramid'
- Large business tend to target the middle class and upper middle class
- However there is a huge market at the bottom of the pyramid of society
- They need products but can not afford high price
- If the products are priced right, there is a big opportunity
- Examples:
  - Shampoo sachet for Re.1
  - Micro credits to rural people to buy a sewing machine, a cow to start milk business, etc. It was observed that default by rural people is significantly less compared to urban people because of the fear of o
  - Jio, Nirma are other examples of targeting the bottom of the pyramid



# Desire to do social good can find new opportunities (Social entrepreneurship)



- Grameen Bank: Mohammad Yunus helped poor to stand on their own legs through micro-businesses
- Aravind Eye Hospitals: Free eye surgery for poor, funded by rich patients, developing low cost intraocular lenses
- Narayana Hrudalaya: Dr Devi Shetty offeres low-priced heart surgeries by employing efficient operation procedures, low cost insurance schemes
- Selco: Dr. Harish Hande developed solar lamps to helps silk farmers harvest mulberry leaves which needs to be done during cooler hours – late evening or early morining
- Rivigo: Helped truck drivers lead a stigma free life through relay based truck logistics
- Apna: Developed an app for finding blue collar jobs such as delivery boys

# Case study: Qalara

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- What was the opportunity identified by Qalara?
- How did Qalara identify the opportunity?

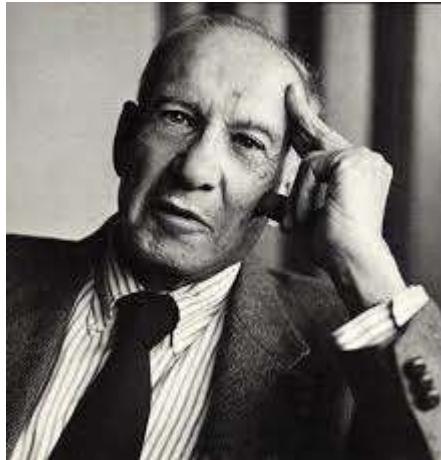


Qalara

---

# Sources of Innovation: Peter Drucker

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Discipline of  
Innovation - Druc

Father of management  
&  
A Social scientist

---

# Sources of Innovation: Peter Drucker

---



Drucker argues that most innovative business ideas come from methodically analyzing seven areas of opportunity

- Some of which lie within particular companies or industries
- Some of which lie in broader social or demographic trends.

Astute managers will ensure that their organizations maintain a clear focus on all seven



# Sources of innovation: Peter Drucker



- Unexpected occurrence
- Incongruities (incompatibilities)
- Process needs
- Industry & market changes
- Demographic changes
- Change in perception
- New knowledge

# Sources of innovation: Peter Drucker

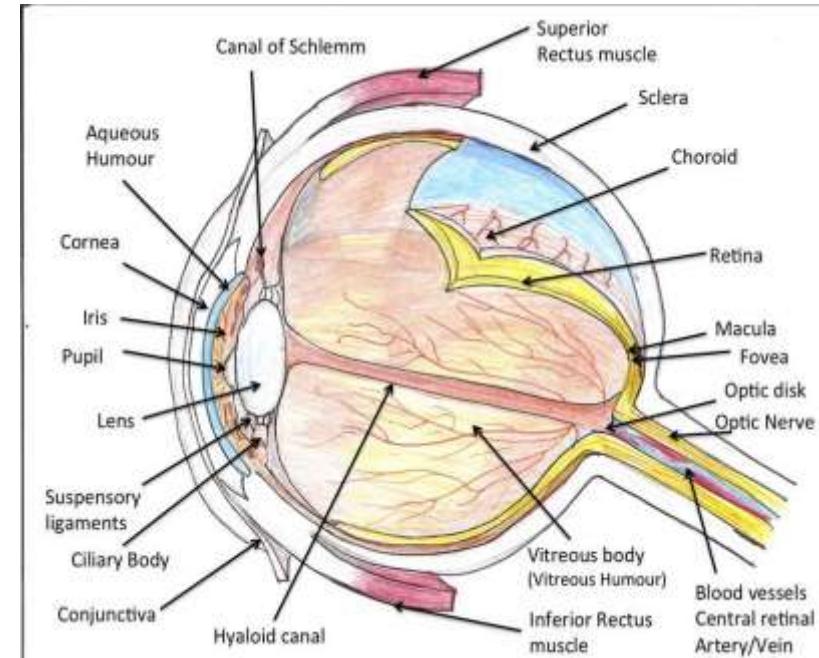


- Unexpected occurrence
  - IBM developed accounting machines in 1930s. Banks did not have money to buy. But libraries had money and they bought 100 machines
  - Ford Edsel was very carefully designed. But people bought cars for lifestyle. This resulted in newer models like Mustang



# Sources of innovation: Peter Drucker

- Incongruities (incompatibilities)
  - Cataract operation: Cutting eye ligament is difficult. Instead used enzyme to dissolve ligament



# Sources of innovation: Peter Drucker



- Incongruities (incompatibilities)
  - Shipping industry trying to improve speed and fuel efficiency. But problem was time wasted at ports to load & unload. Adopted containers used in railroad and trucks



# Sources of innovation: Peter Drucker

---



- Process needs
    - Newspapers needed a faster way to print. This resulted in Linotype machine
    - Those days newspapers did not make much money. So they invented advertisements and kept the cost to customer low
  - Industry & market changes
    - Retail industry changes: E-Commerce
    - Banking changes: Payment banks
-

# Sources of innovation...

---

- Demographic changes
    - 1970s saw baby bust and education explosion. This led to shortage of workers. Japan created Robots
    - Affluent educated young people wanted a different kind of holiday. This led to resort business
  - Change in perception
    - In spite of fall in mortality rates, Americans were concerned about cancer, heart disease, etc. This led to health mags, gym, healthy foods
  - New knowledge
    - Computers
    - Etc.
-

# Principles of Innovation – Peter Drucker

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- Go out, look, ask, listen, because innovation is conceptual & perceptual
  - Keep innovation simple and focused. Else people get confused
  - Start small: Example putting the same number of match sticks into a matchbox (it used to be 50), gave Swedes a world monopoly for half a century
  - Aim at leadership from the beginning, else it is unlikely to be innovative enough
  - Innovation requires knowledge, ingenuity, and, above all else, focus. Edison worked in electric field only. Citibank did not venture into health care
  - If diligence (careful), persistence, and commitment are lacking, talent, ingenuity, and knowledge are of no avail. Like in any other endeavour
-

# Identify opportunities...

---

- Annual Idea generation by Bill Gates
    - 2 weeks shut out from world
    - Go through ideas submitted by employees
  - Hack days (Inspired)
    - *Hack days – directed and undirected.*
    - *Eg of directed hack day with a theme – reduce customer churn, increase life time value (Inspired)*
-

# Ideation techniques (Cooper & Edgett)

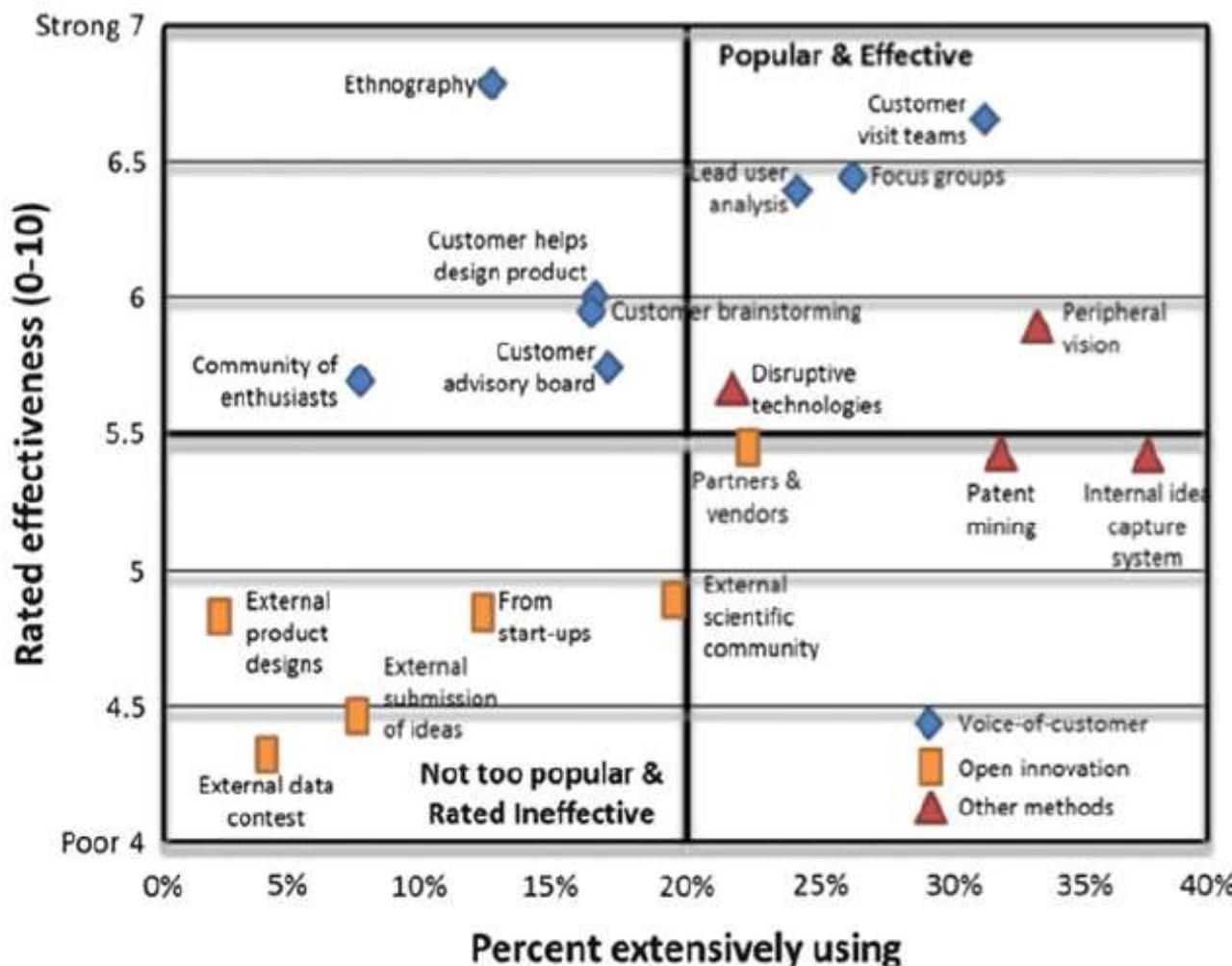


Fig. 5.5 The effectiveness vs. popularity of ideation techniques [CooEdg09]. Used with permission

# Case study: DBS

---

Are you really innovating around customer needs? – HBR

- What is the assumed need & real need of the customer of DBS?
- How did DBS satisfy that need?



DBS case - HBI

---

# Case study: ID Fresh Foods

---

Innovation ideas from ID Fresh Foods – PC Musthafa

What innovation lessons can we learn from ID Fresh Foods?

- Fresh & preservative free is possible
- Packaging innovation – Vada
- Marketing innovation: Trust shops



ID Fresh foods

---

# Exercise

---

Consider your current job & company

Think about the unmet / underserved needs of your customers

Give one example of such a need & its compelling value / benefit to customer.

---



# Appendix

# The Lean Startup

BY ERIC RIES





# Software product management

## Assess opportunity

**BITS** Pilani

Nandagopal Govindan

# Contents

- 
- Define value proposition
  - Assess value of the product
  - Assess the risks
-

# Define value proposition

---

## Steps:

- Define Customer problem / pain point
    - Ex. Difficult to reach Metro station (Bounce)
  - Explain how your product solves customer problems or improves their situation (relevancy)
    - Ex. Rent a bike – pickup near your house & drop anywhere (Bounce)
  - Determine a specific set of benefits it delivers, preferably quantifiable (Value)
    - Ex. Easy to reach Metro station. Saves 30 minutes.
  - Explain why the customer should buy your product instead of the competition's (Differentiation)
    - Ex. More convenient than walking to bus stop, then taking a bus and then once again walk to the Metro station
-

# Define value: Examples

Product	Pain point	How does it solve	Benefit / Value prop.	Differentiation from competition
Bounce	Difficult to reach Metro station	Provide bike on rent – pickup & drop anywhere	Easy to reach Metro station	More convenient than bus
AirBnB	Unable to get a feel for the city & its people & culture	Rent room in a house instead of hotel	Get unique experience of local culture	Hotels do not provide this experience
Zoom	Poor video quality	Better technology	Superior experience	Superior quality compared to WebEx

# Define value: Exercise

Product	Pain point	How does it solve	Benefit / Value prop.	Differentiation from competition
Rivigo				
OYO				
Postman				

# Assess value of the product

---

- Talk to potential customers to assess the opportunity
    - *This is one of the most powerful and important skills for any product manager and very often the source or inspiration for many breakthrough product ideas.*
  - Through interview, understand
    - Are your customers who you think they are?
    - Do they really have the problems you think they have?
    - How does the customer solve this problem today?
    - What would be required for them to switch?
-

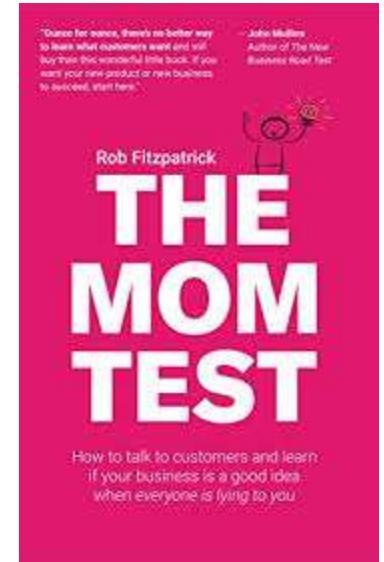
# Interview customer: Example



‘Mom Test’: How to ask the right questions to assess a product idea?



Mom test - Ch  
1



# Mom Test: Part 1

---

What wrong questions were asked?

- Asking close ended question “You like your iPad right?” instead of “How often do you use the iPad?” or “What do you use your iPad for?”
  - Asking whether you will buy the product without first explaining the product: “Would you ever buy an app which was like a cookbook for your iPad?”
  - Telling the features without first trying to understand what features are needed “you can share recipes with your friends, and there’s an iPhone app which is your shopping list. And videos of that celebrity chef you love”.
-

## Mom test: Part 2

---

Did Mom have a need for recipe book on iPad?

Probably for healthy dishes

What market segments could be discovered from the conversation?

Young people

What kind of recipe books could be targeted to young people?

Basic dishes

What is good about this question: “What’s the last cookbook you did buy for yourself?”

---

# Tips for customer interview

---

- Go with intention to learn – Ask about their work, how they do it
  - Meet customer in their location – This will make them comfortable
  - Go with Product manager, UX designer and engineer – to brainstorm later
  - Do the customer's job for them, to understand the problem
-



# Insight to be gathered during opportunity assessment:

---

- Do consumers have the problem you are trying to solve? – Is our hypothesis true?
  - If there was a solution, would they buy it? – Is the need compelling?
  - Would they buy it from us? - Are we better than competition?
-

# Also try to signup pilot customers, during this phase

---



- Identify 6 customers who truly feel the pain and are near desperate for the solution we plan to build, who are willing to test the product and buy it once ready and willing to be reference.
  - If you are unable to find even 4 or 5, then we are probably chasing a problem that is not very important.
  
  - It is important to explain that you are trying to build a product useful to many customers and not a custom solution.
  - Explain that you will dive deep into the problem and build a single solution that works well for all 6 customers.
-

# Assess opportunity: Exercise

---

Design a set of interview questions to assess the following product idea

- a) Online book library for students - technical & management books that allows student to borrow & read digital books (similar to Spotify) (B2C)
  - Pain point: Students need to refer to many books. But only some parts of the book are useful. Buying the whole book is not value for money
  - Solution:
    - Tie-up with publishers to make books available online
    - Students pay a monthly subscription
    - Students get to borrow 5 books at a time and read them online
    - Publishers gets commission based on books borrowed and the duration the book was used

# Role play: Interview

---

Let us do a role play

- Need 2 volunteers – Interviewer and Interviewee
  - Interviewer: Vinay Adaki, Shashank
  - Interviewee: Dewraj, Vinay
  - Let us observe the conversations and note down which questions were good and which could have been better
  - Please note that if we were the interviewer, we might have fared in a similar way
  - This is only a learning exercise and not a test of your interview skills
-

# Possible questions to ask the students...

---



- What courses are you doing?
  - How many hours do you study every week?
  - What resources do you use to study?
  - How sufficient are these, for your study?
  - What kind of additional resources would help?
-

# Assess opportunity: Exercise

---

Design a set of questions to validate the following product idea

- a) Website to enable a company to identify the right software product to purchase for a given business need (B2B product)
  - Pain point: There are many products in same category. Companies find it hard to pick a right product for their needs such as logistics, workflow, payroll, sales, customer service
  - Solution:
    - Provide a directory of selected software products along with product details, product comparisons, business use cases they support, etc.
    - Provide phone consultancy to help clients select the right product for their need





# Appendix



# Software Product Management

## Risk assessment

**BITS** Pilani

Nandagopal Govindan

# Contents

- Value risk
- Usability risk
- Feasibility risk (technical feasibility)
- Business viability risk

# Introduction

---

Key risks to be assessed are:

- Will the customer buy this, or choose to use it? (*Value risk*)
  - Can the user figure out how to use it? (*Usability risk*)
  - Can we build it? (*Feasibility risk*)
  - Does this solution work for our business? (*Business viability risk*)
-

# Test value

---

- Good product teams spend most of their time on creating value. If the value is there, we can fix everything else.
  - If value is not there, then it does not matter how good our usability, reliability, or performance is.
  - Just because someone can use our product doesn't mean they will choose to use our product.
-

# Test value

---

- Identify 6 customers who truly feel the pain and are near desperate for the solution we plan to build, who are willing to test the product and buy it once ready and willing to be reference.
  - If you are unable to find even 4 or 5, then we are probably chasing a problem that is not very important.
  - It is important to explain that you are trying to build a product useful to many customers and not a custom solution.
  - Explain that you will dive deep into the problem and build a single solution that works well for all 6 customers.
-

# Test Value

2 types of testing value

- Qualitative
- Quantitative

# Qualitative testing

---

Qualitative testing is focused on the *response*, or reaction:

- Do customers love this?
  - Will they pay for it?
  - Will users choose to use this?
  - And most important, if not, why not?
  - Are they willing to recommend?
  - Are they willing to spend significant time to work with you to develop the product
  - **Any other?**
-

# Quantitative testing

---

Techniques to do quantitative testing:

- Landing page technique (also called Fake door)
  - Crowd funding technique
  - A/B testing for features
  - Use pre-selected / agreed customers who have agreed to be partners / to discover the product – how many of those want it
  - Any other?
-

# Test Usability: How?

---

- Get sample users to test. Tell them it is just a prototype of an early product idea, request for honest feedback
- See if they can tell from the landing page what the product is meant for
- Observe if users can easily do the tasks
- Identify places where the model presented by the software (design model) does not match with how the user is thinking (mental model)
  - For example, a user clicked on a button and you are not sure why he did it (these need to be fixed in next iteration)
- Wrap up by asking:
  - Which features were valuable? (value)
  - How easy to use was the product? (usability)
  - How likely are you to buy the product? (value)
- Experience sharing....

# Test feasibility

## (Technical feasibility)

---



- This is needed when we need to use new technologies like AI / ML, Robotics, Augmented reality
  - Getting the engineer's perspective earlier also tends to improve the solution itself, and it's critical for shared learning
  - Example: There can be multiple ways to solve the problem of preventing leakage of confidential company data
    - Check when data is being sent out: High on safety, low on performance, low on deployment
    - Check after data is being sent out: Low on safety, High on performance, high on deployment
    - Which solution is better is for the business to decide
  - Experience sharing...
-

# Test business viability

Business aspects to be considered:

- Marketing
- Sales
- Customer service
- Finance
- Legal

# Marketing

---

Your product must fit within the brand (image) promise of your company's other offerings.

- HSBC PayMe Mobile app example:
    - HSBC bank is known for high quality customer service.
    - They planned to introduce a Mobile app PayMe which should have highest quality of UX, performance and security.
    - It can not afford to have a login feature, where the user logs in with Facebook user id / password or Google user id / password, even though this may be good enough.
    - The perception created will be that the bank is compromising on security by depending on external entities such as Facebook
-

# Marketing...

---

Your product must fit within the brand (image) promise of your company's other offerings.

IBM Mainframe example:

- IBM is known for highly reliable products and high customer service.
  - Once a customer's mainframe crashed
  - An engineer flew from Bombay to Delhi with a small part to fix a mainframe, because it was mission critical for the org.
  - If the new product idea is not backed up by a solid customer support plan, it will not fit in the brand promise of IBM
-

# Sales

---

Do the sales people / channels have the skills to sell the product?

- Our sales people may be familiar with selling business oriented products such as Payroll, Customer support or Expense process.
  - Now if we are introducing a tech oriented product for detecting autism using AI that analyses videos of patients who have autism (CogniAble), then the sales staff may not have the skills to handle this product and we need to have a plan to address this.
  - If we are used to sell product a B2C via channel partners and now we are planning to do direct sales because it is a B2B product, then our sales people may not be able to handle this.
-

# Customer service

---

Do we need a high touch customer service model or low touch?

- Twilio offers simple API such as: Dial, Play, Disconnect
  - Open API of banks: This may require a high level of support since it involves money
-

# Finance

---

The costs to produce, market and sell your product must be sufficiently less than the revenue your product generates. What is the ROI, break even?

- Let us say we are going to spend 100 on building, marketing and selling and recurring operational costs are negligible (hypothetical)
- If the cost of the product is 1 and sales per month is 2 copy, then it will take 4 years to recover the cost. The break-even period is 4 years
- ROI in 10 years is  $240$  ( $10$  years \*  $24$  copies per year \*  $1$ ) -  $100$  =  $140$

Experience sharing...

---

# Legal

---

Are there any Privacy concerns, compliance concerns, intellectual property, and competitive issues

- Privacy & Compliance:
  - EU data should be stored in EU data centers only
  - HIPAA compliance for health records related data
  - SOX
  - GDPR
- Intellectual property
  - Are we using any IP without purchasing them – eg. Samsung, Nokia, Apple
  - Open source software licence usage: what can be distributed freely
    - GNU General Public License (GPL)
    - Apache license

Experience sharing....

---

# Exercise: Risk identification and mitigation

---



- Vedicure is a medical device company that wants to develop a device (hardware + software) to cure fever, stomach pain, headache, etc.
- The device produces sound waves (vibrations) based on Vedic mantras, which has a positive effect on the patient.

You are a mentor to the product team. What prominent risks do you see & what mitigation approach would you suggest?

Answer:

- Feasibility risk – Create a PoC
  - Marketing risk (acceptance by market may be a challenge) – Get Vedic scholars like Baba Ramdev, to endorse the product
-

# Exercise: Risk identification and mitigation



- Ad-creator is a software that creates an ad based on product, its value and the target segment.
- The ad consists of heading, description text and a picture.
- This ad can then be published in newspapers.

You are an Angel investor. What prominent risks do you see & what mitigation approach would you suggest?



Answer:

- Feasibility – Create PoC
- Marketing risk – Sign up high profile pilot customers

- Khata-book is a product that maintains the purchases you make at your local kirana (small grocery) store and you can make payment at the end of the month.
- Target market is Kirana stores and customers (who will have to approve the purchase)

You are a product consultant. What prominent risks do you see & what mitigation approach would you suggest?

Answer:

- **Value risk** – Speak to 50 kirana stores and 1000 customers to assess value
- **Usability risk** – since users are kirana store owners & lay people. Do usability testing with sample users



# Experience sharing...

---

How did you address the risks in your product solution?





# Appendix



**BITS Pilani**



# **Software Product Management**

**Create business plan – Lean  
Canvas**

**Nandagopal Govindan**



# Contents

# Introduction

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- Once we have assessed an opportunity, it is good to put all our thoughts together on paper.
  - A detailed business plan covering – problem, solution. USP, market size, revenue generation, etc. needs to be created
  - A simpler 1-page plan can be created for quick understanding
-

# Business Model Canvas by Alexander Osterval



Key partners	Key activities	Value propositions	Customer relationships	Customer segments
Who are our key partners? Who are our key suppliers? Which key resources are we acquiring from our partners? Which key activities do partners perform?	What key activities do our value propositions require? Our distribution channels? Customer relationships? Revenue streams?	What value do we deliver to the customer? Which one of our customers' problems are we helping to solve? What bundles of products and services are we offering to each segment? Which customer needs are we satisfying? What is the minimum viable product?	How do we get, keep, and grow customers? Which customer relationships have we established? How are they integrated with the rest of our business model? How costly are they?	For whom are we creating value? Who are our most important customers? What are the customer archetypes?
	<b>Key resources</b>		<b>Channels</b>	
	What key resources do our value propositions require? Our distribution channels? Customer relationships? Revenue streams?		Through which channels do our customer segments want to be reached? How do other companies reach them now? Which ones work best? Which ones are most cost-efficient? How are we integrating them with customer routines?	
Cost structure	Revenue streams			
What are the most important costs inherent to our business model? Which key resources are most expensive? Which key activities are most expensive?	For what value are our customers really willing to pay? For what do they currently pay? What is the revenue model? What are the pricing tactics?			

Ref: [www.businessmodelgeneration.com/canvas](http://www.businessmodelgeneration.com/canvas)

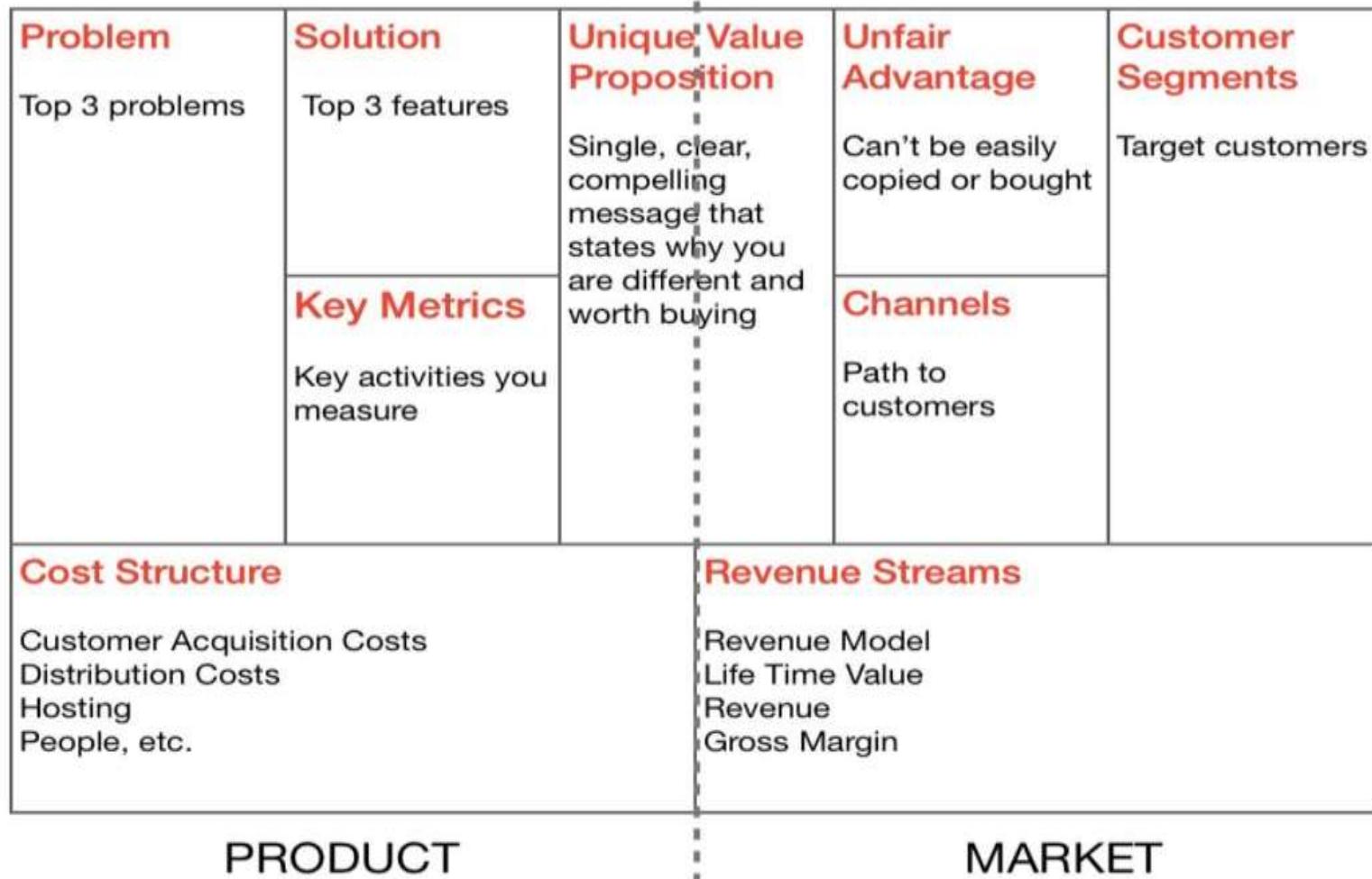
# Lean canvas – a simplified model

---



- However when are in the early stage, it may not be necessary to go so much into detail, because our product is not yet ready, it has not been validated and many things will change which will yield the model redundant / waste.
  - Hence a simplified canvas called **Lean Canvas** is recommended at this early stage. This was proposed by Ash Maurya. Helps get your idea(s) out from your head into a tangible format so that you can communicate that with others
-

# Lean canvas



Lean Canvas is adapted from The Business Model Canvas (<http://www.businessmodelgeneration.com>) and is licensed under the Creative Commons Attribution-Share Alike 3.0 Un-ported License.

# Some explanations

---

- Channels can be email, social, CPC ads, blogs, articles, trade shows, radio & TV, webinars etc.
  - Metrics can be how many visited, how many signed up, what is the usage, how many continued using
  - Unfair advantage can be insider information, a dream team, getting expert endorsements, existing customers etc
-



## PROBLEM

- Lack of online bookstores
- Hard to select books in offline stores (no rating, recommendations, hard to find a book, etc.)

## SOLUTION

Build an online bookstore with millions of titles

## UNIQUE VALUE PROPOSITION

Buy books using a PC from home/office (without visiting several local stores to find a particular book)

## UNFAIR ADVANTAGE

- Lower price (less employees, less rent payment and other costs)
- no competition for online booksellers

## CUSTOMER SEGMENTS

Book readers

## EXISTING ALTERNATIVES

- Interloc (future Alibris)
- Local booksellers
- Barnes & Noble

## KEY METRICS

- Website traffic
- CAC
- ROI (sales conversion rate, revenue per visitor, percentage of shopping cart abandoned rate, etc.)

## HIGH-LEVEL CONCEPT

Earth's biggest bookstore (company's original tagline)

## CHANNELS

Affiliates  
Resellers

## EARLY ADOPTERS

- Customers searching for rare and specialized books
- Internet users looking for bookselling services

# Amazon Lean Canvas...



<https://railsware.com/blog/5-lean-canvas-examples/>

## PROBLEM

- Hard to find cheap/affordable accomodation options when travelling
- Staying in hotels travellers cannot get authentic experiences of a location
- It's not easy for a homeowner to monetize vacant areas on a day-by-day basis
- Uncultivated home sharing culture

## EXISTING ALTERNATIVES

Booking.com  
Hotels.com

## SOLUTION

- An online service where travelers can rent an affordable local apartment, and homeowners can earn extra money by renting out vacant areas on a day-by-day basis

## KEY METRICS

- Number of views-to-bookings per host
- Number of hosts applied
- NPS
- DAU/MAU

## UNIQUE VALUE PROPOSITION

- Travelers can get authentic experience of local area
- Extra monetization of vacant areas for homeowners

## HIGH-LEVEL CONCEPT

Everyone can become a host  
Sharing economy

## UNFAIR ADVANTAGE

- Any homeowner can rent out space
- Trust building: bi-directional rating system of hosts and visitors
- Insurance by default for hosts

## CHANNELS

- Referrals
- Recommendations
- Advertising (both online and offline)

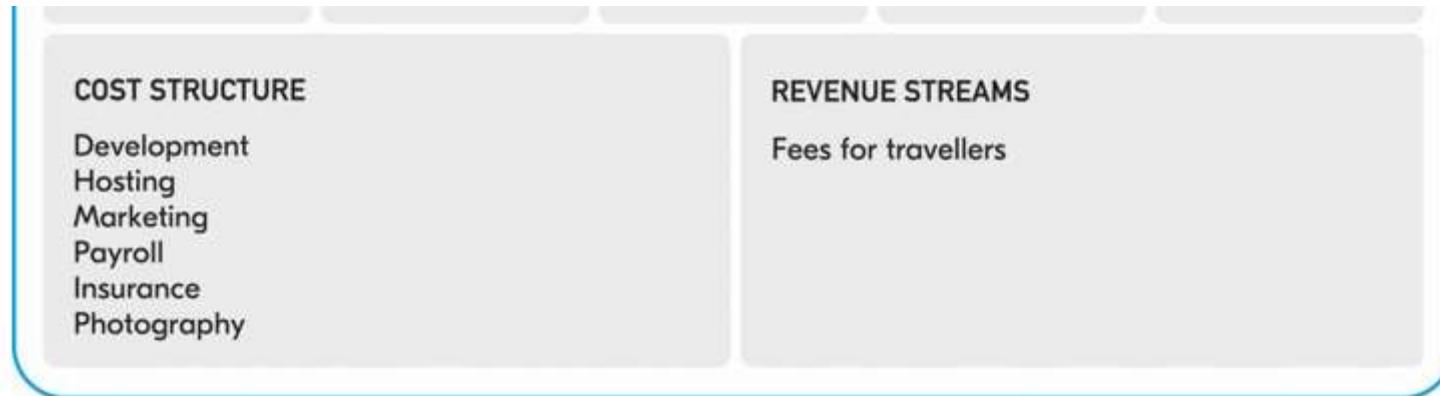
## CUSTOMER SEGMENTS

- Travellers looking for an adequate accommodation experience for a low price
- People having some accomodation options to become a host

## EARLY ADOPTERS

People ready to share their residence and earn money as hosts

# AirBnB Lean Canvas...



<https://railsware.com/blog/5-lean-canvas-examples/>

# Exercise

Create a Lean Canvas for

1. Rivigo
2. Qalara

# Solution



Lean Canvas -  
Rivigo



# Appendix



**BITS Pilani**



# **Software Product Management**

**Specify product features –  
Story Map**

Nandagopal Govindan

# Contents

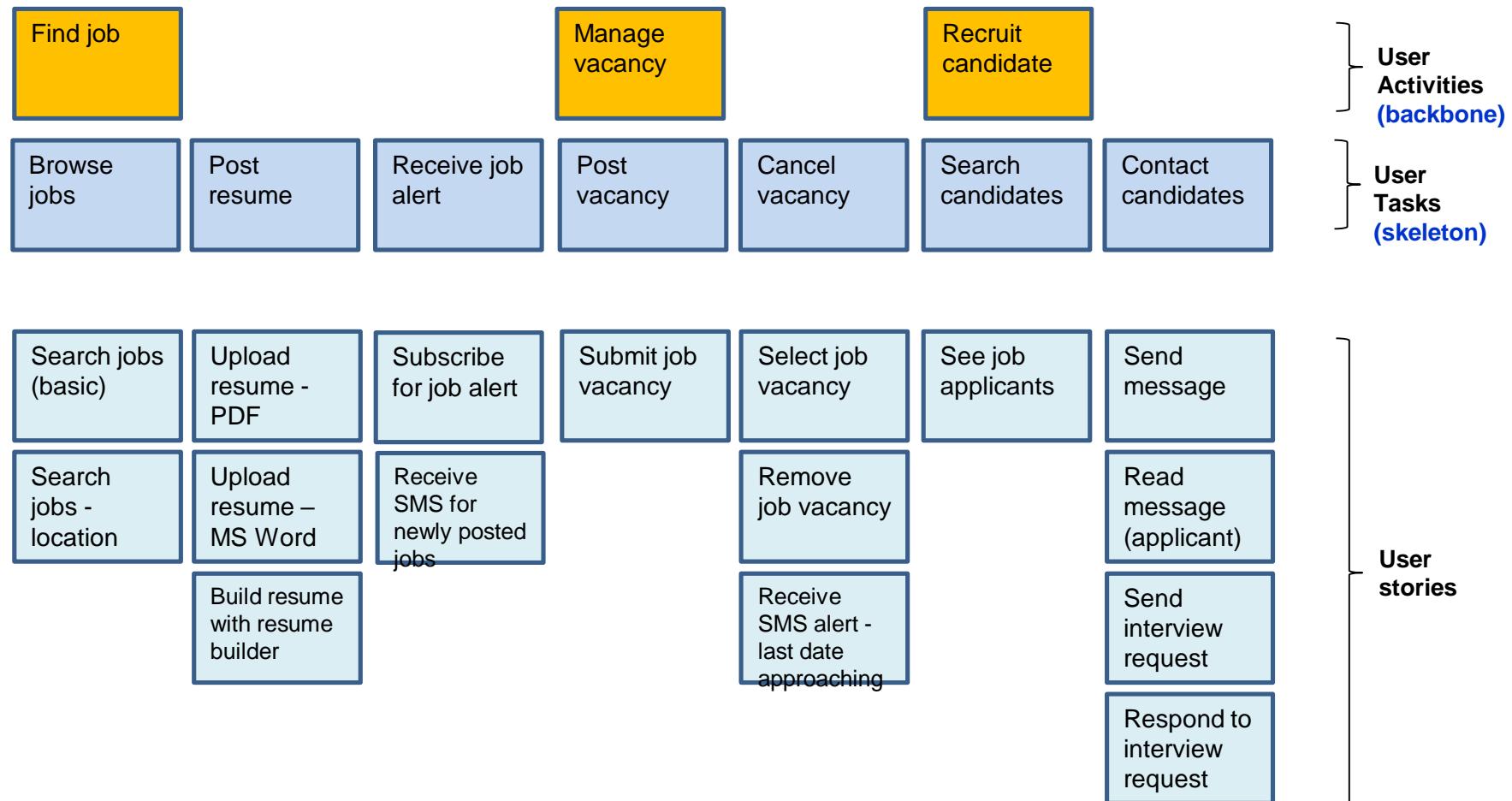
- Story map
- Classification of features: Kano model
- Exercise

# Introduction

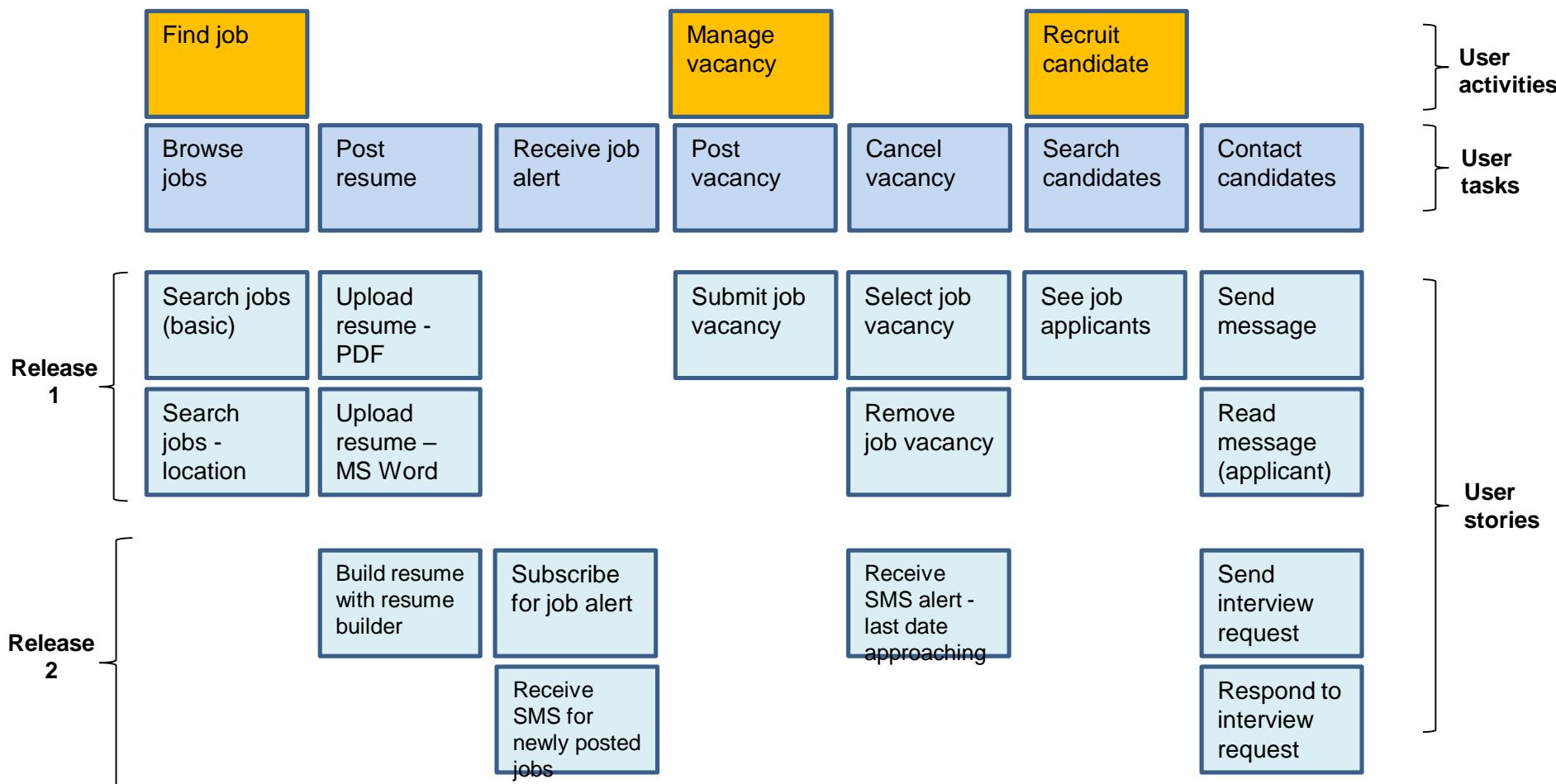
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- Once we have understood the need and we have assessed the need by interacting with customers & users, we need to capture all the requirements / features / functionality
  - Story map** is an effective tool to capture the features
  - Invented by Jeff Patton
-

# Story map: Job portal



# Story map: Job portal



# About Story map

---

- Story map
    - Uses top down
    - Helps organize features based on importance
    - Helps plan releases
-

# Exercise

Create story map for:

- Hotel booking software

# Solution



	USER MANAGEMENT			BOOK ROOM			CHANGE RESERVATION		
	Register	Login	Update Preferences	Search for Room	View Room Info	Book Room	View Reservation	Change Reservation	Cancel Reservation
RELEASE 1	Create New User	Create Login Form		By Room Type	Show Pictures	Credit Card Form	By Reservation #	Change Date	Change Room
				By Availability	View Room Details				
				By Location					
RELEASE 2		Update Name and Email		Integrate with 3rd Party		PayPal	By Username		Cancel Online
			Add Payment Information						
RELEASE 3	Embed Room Registration form on Home page			Make Room Details Available via API	Google Checkout		Change Reservation API Call		
BACKLOG	Google Account Login	Upload Profile Image			Book Room through Expedia.com				
	Facebook Login				Book Room through Kayak.com				

# We need to classify and prioritize features: Kano model



Classification of product features:

- Must have
- Wants
- Delighters

# Classification of features:

## Example: Laptop



Must have	Wants	Delighters
<ul style="list-style-type: none"><li>• 2 Ghz CPU</li><li>• 4 MB RAM</li><li>• 1 TB Disk</li></ul>	<ul style="list-style-type: none"><li>• OS pre-loaded</li><li>• Anti-virus</li><li>• Finger print scanner</li><li>• Touch screen</li><li>• Dolby sound</li><li>• Long battery life</li><li>• Light weight</li></ul>	<ul style="list-style-type: none"><li>• Green PC (low power consumption)</li><li>• Spill proof (water proof) key board</li><li>• 4G card for internet</li></ul>

# Classification of features: Job portal software



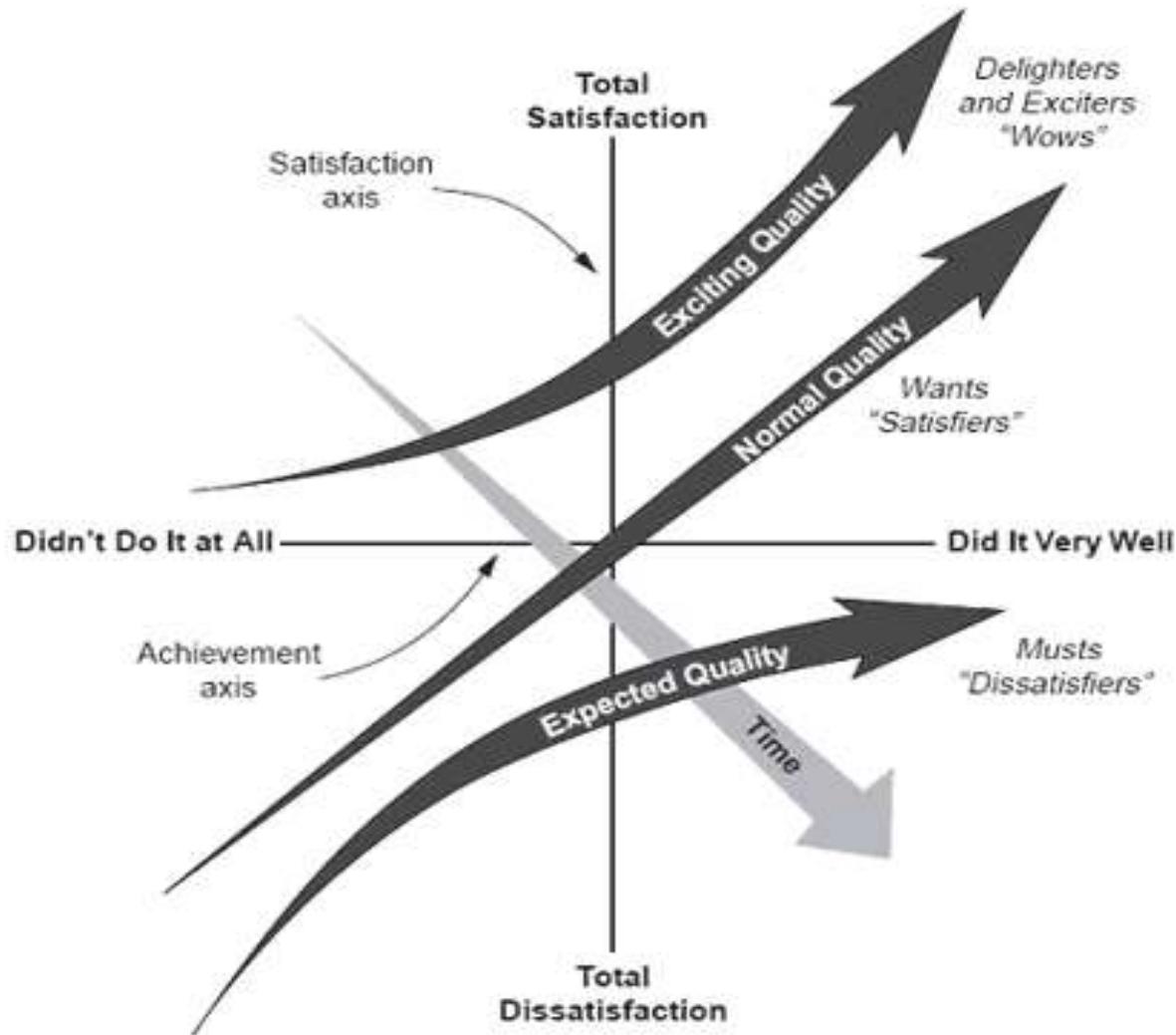
Must have	Wants	Delighters
<ul style="list-style-type: none"><li>• Post vacancy</li><li>• Apply</li><li>• View applicants</li></ul>	<ul style="list-style-type: none"><li>• Get job alert</li><li>• Hot job indicator</li></ul>	<ul style="list-style-type: none"><li>• Resume builder</li><li>• Good Interview videos</li><li>• Tips to negotiate salary</li><li>• Psychometric test</li></ul>

# Classification of features: Job portal software



Must have	Wants	Delighters
<ul style="list-style-type: none"><li>• Post vacancy</li><li>• Apply</li><li>• View applicants</li></ul>	<ul style="list-style-type: none"><li>• Get job alert</li><li>• Hot job indicator</li></ul>	<ul style="list-style-type: none"><li>• Resume builder</li><li>• Good Interview videos</li><li>• Tips to negotiate salary</li><li>• Psychometric test</li></ul>

# Classification of features changes over time...



As people start using the products, some features move on from Wants to Must haves and Delighters to Wants.

# Classification of features changes over time...



Example of delighters becoming wants: Job portal software

Must have	Wants	Delighters
<ul style="list-style-type: none"><li>• Post vacancy</li><li>• Apply</li><li>• View applicants</li></ul>	<ul style="list-style-type: none"><li>• Get job alert</li><li>• Hot job indicator</li></ul>	<ul style="list-style-type: none"><li>• Resume builder</li><li>• Good Interview videos</li><li>• Tips to negotiate salary</li><li>• Psychometric test</li></ul>

# Exercise

---

Identify 'Must have', 'Wants' & 'Delighter' features of

- Online banking
  - Airline reservation
  - eCommerce
-



# Appendix

# Story map: Email system





# Software Product Management

## Create Minimum Viable Product (MVP)

**BITS** Pilani

Nandagopal Govindan

# Contents

- What is MVP?
- Types of MVP
- When to use which MVP?

# Introduction

---

- Product is a risky business
  - We should not wait to develop all the features to launch it.
  - Rather we should develop a product with just enough functionality for users to **use it meaningfully and derive significant value** from it.
  - Such an approach will reduce risk
-

# What is MVP?

---

- Frank Robinson says "The MVP is the right-sized product for your company and your customer. It is **big enough to cause adoption, satisfaction, and sales**, but not so big as to be bloated and risky"
  - Eric Reis says ““The minimum viable product is that version of a new product which allows a team to **collect the maximum amount of validated learning about customers with the least effort.**”
-

# What is MVP?...

---

- A Minimum Viable Product **helps** entrepreneurs start the process of **learning as quickly as possible**. It is simply the **fastest way to** get through the **build-measure-learn** feedback loop with the minimum amount of effort.
  - Its goal is to **test fundamental business hypotheses**
    - Is this the need?
    - Is there enough value? (Product–Market fit)
    - Does it make business sense?
-

# MVP need not always be a product...



It can be a

- Prototype
- Video
- Anything that allows us to test the value



# Different types of MVP

# Facebook MVP

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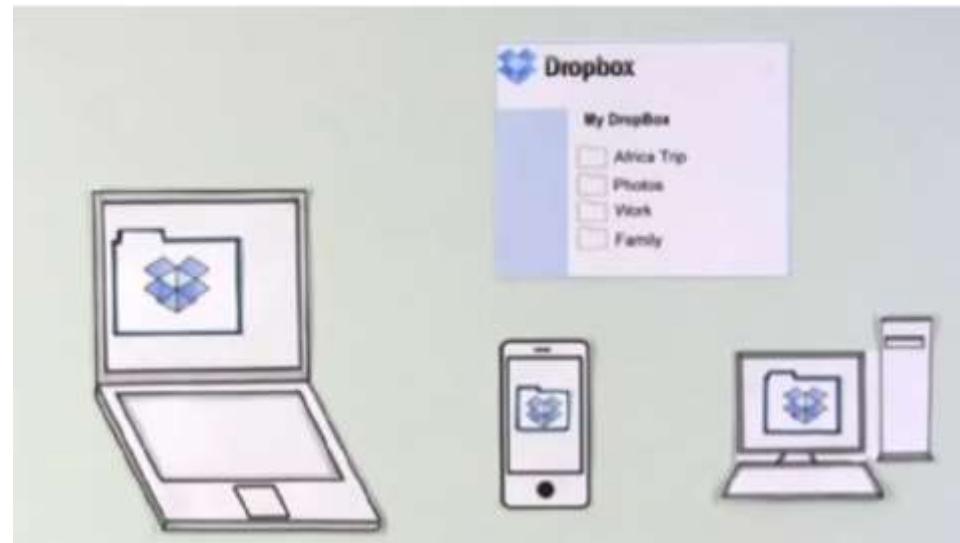
- Facebook used a simple platform that connected students from the same classes by allowing them to post messages to shared boards.
  - By introducing Facebook to a super-narrow segment of the market, Zuckerberg managed to validate his idea
-

# Uber MVP

- When Uber (then called UberCab) launched in 2009, it only worked on iPhones or via SMS, and it was available only in San Francisco.
- Uber's MVP was enough to prove that the idea of a cheap ride-sharing service had a market.

# Dropbox MVP

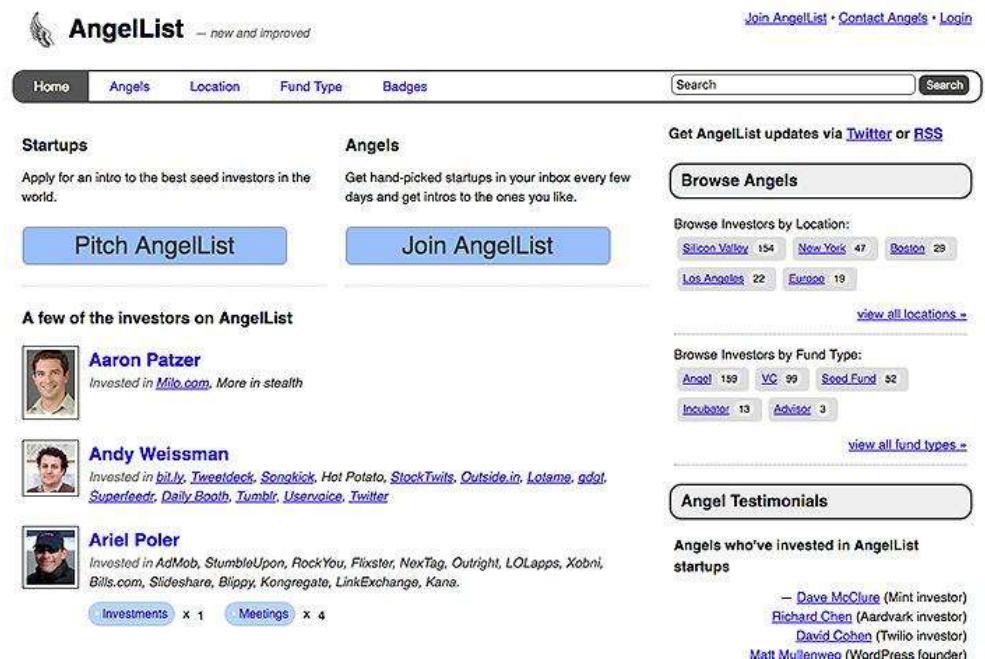
- Dropbox used a video to test hypothesis
- [https://www.youtube.com/watch?v=xy9nSnalvPc&feature=emb\\_title](https://www.youtube.com/watch?v=xy9nSnalvPc&feature=emb_title)
- The video led to 75,000 people waiting for a beta invite, literally overnight



# AngelList MVP



- AngelList is a vast directory of startups and investors, powered by intelligent match-making algorithms and search functionalities.
- Babak and Naval were doing **manual email intros** between startups and **investors** using their broad network of contacts.
- Only after they saw a potential in their idea, did they build their first website.



The screenshot shows the homepage of AngelList. At the top, there is a navigation bar with links for 'Home', 'Angels', 'Location', 'Fund Type', 'Badges', 'Search', 'Join AngelList', 'Contact Angels', and 'Login'. Below the navigation bar, there are two main sections: 'Startups' and 'Angels'. The 'Startups' section has a button to 'Pitch AngelList'. The 'Angels' section has a button to 'Join AngelList'. To the right, there are links to 'Browse Angels' and 'Browse Investors by Location' with categories for Silicon Valley, New York, Boston, Los Angeles, Europe, and a link to 'view all locations'. Below these, there is a section for 'Browse Investors by Fund Type' with categories for Angel, VC, Seed Fund, Incubator, and Advisor, along with a link to 'view all fund types'. At the bottom, there is a section for 'Angel Testimonials' and a list of angels who have invested in AngelList startups, including Dave McClure, Richard Chen, David Cohen, and Matt Mullenweg.

Join AngelList • Contact Angels • Login

Home Angels Location Fund Type Badges Search

Startups Angels Get AngelList updates via Twitter or RSS

Apply for an intro to the best seed investors in the world.

Pitch AngelList Join AngelList

Browse Angels

Browse Investors by Location:

Silicon Valley 154 New York 47 Boston 29

Los Angeles 22 Europe 19

view all locations

Browse Investors by Fund Type:

Angel 159 VC 99 Seed Fund 32

Incubator 13 Advisor 3

view all fund types

Angel Testimonials

Angels who've invested in AngelList startups

— Dave McClure (Mint investor)  
Richard Chen (Aardvark investor)  
David Cohen (Twilio investor)  
Matt Mullenweg (WordPress founder)

# ‘Buffer’ MVP

---

Buffer:

- Buffer is tool that allows scheduling your Tweets
  - The founder Joel Gascoigne did something similar to Dropbox’s MVP.
  - However, instead of a video, the smoke test was a [minimal landing page](#).
-

# Buffer

Tweet more consistently with  **buffer**

**1** Choose times to tweet.

For example, 3 times a day at 9:30, 13:30 and 17:30.

**2** Add tweets to your buffer.

Manually or with our handy browser extensions.

[Plans and Pricing](#)

**3** buffer does the rest. Relax.

We tweet for you. Just keep that buffer topped up!

© 2010 buffer. All rights reserved.



Tweet more consistently with  **buffer**

**Hello! You caught us before we're ready.**

We're working hard to put the finishing touches onto buffer. Things are going well and it should be ready to help you with Twitter very soon. If you'd like us to send you a reminder when we're ready, just put your email in below:

Your email

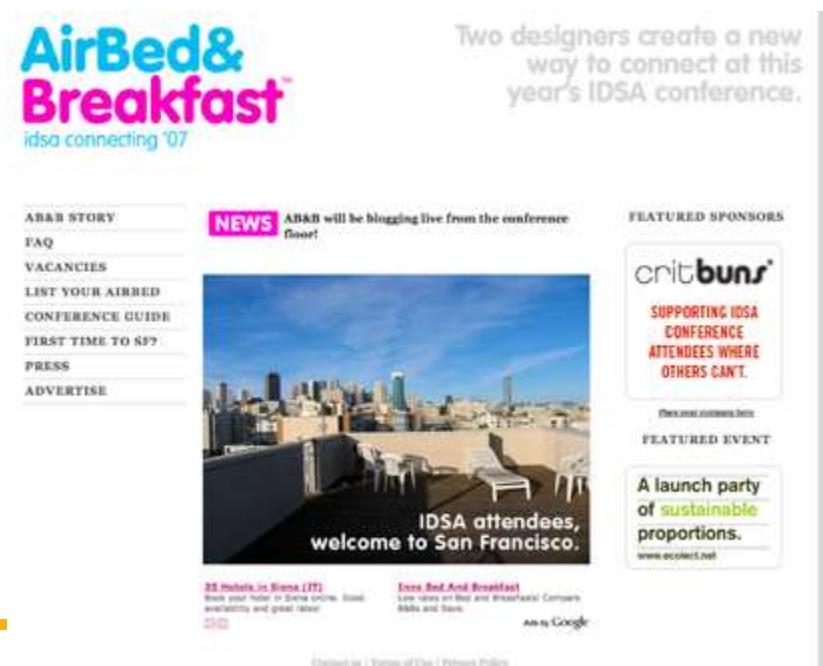
**Remind me**

© 2010 buffer. All rights reserved.

lead

# AirBnB MVP

- Back in 2007, there was a great design conference in San Francisco. Hotels were over booked
- The Airbnb team decided to offer their house on rent
- They hacked together a website to advertise.
- They got 3 guests.
- This supported the market insight that potential customers would be willing to pay to stay at someone else's home rather than in a hotel.



**AirBed&Breakfast**  
idsa connecting '07

Two designers create a new way to connect at this year's IDSA conference.

**AB&B STORY**

**FAQ**

**VACANCIES**

**LIST YOUR AIRBED**

**CONFERENCE GUIDE**

**FIRST TIME TO SF?**

**PRESS**

**ADVERTISE**

**NEWS** AB&B will be blogging live from the conference floor!

**FEATURED SPONSORS**

**critbuns**  
SUPPORTING IDSA CONFERENCE ATTENDEES WHERE OTHERS CAN'T.

**FEATURED EVENT**

A launch party of sustainable proportions.  
[www.idsa07.net](http://www.idsa07.net)

35 Hotels in 5 Miles (17)  
Book your hotel in 5 clicks quickly. Simple availability and great rates!

**Inns Bed And Breakfast**  
500+ sites on-line and in print! Corporate Web site and books

AmEx Google

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# Aardvark MVP

---

- Wanted to develop a product which will answer questions like "What is a good place to have Italian food?"
  - They developed a front-end to ask questions, but these were answered by humans. There was no software in back-end.
  - Once they found that there was a demand, they automated it. (Lean Startup)
-

# Oculus VR MVP

Oculus VR



- **Founder/s:** Palmer Luckey was 20 years when he got the idea
- **The Idea:** Oculus Rift was created with a simple idea of bringing VR experience to passionate gamers
- **Crowdfunding:** [Kickstarter campaign](#) started in 2012
- **Funded:** \$2,437,429 USD
- **Backers:** 9,522 people
- **Business Today:** Revenue from Oculus Rift is forecasted to amount to [4.95 billion U.S. dollars](#) worldwide in 2019 and that's only from hardware
- **Website:** <https://www.oculus.com/>

# PopSocket MVP

PopSocket



- **Founder/s:** David Barnett, professor of philosophy in Colorado
- **The Idea:** First version of PopSocket was created to keep the cables from the earphones organized and tied to the smartphone
- **Crowdfunding:** [Campaign](#) started in 2012 on Kickstarter
- **Funded:** \$18,591 USD
- **Backers:** 520 people
- **Business Today:** In 2018, PopSocket LLC's revenue was over [\\$200 million U.S. dollars](#), with a profit of over US\$90 million.
- **Website:** <https://www.popsockets.com/>

# Summary of MVP types

---

Video	: DropBox
Simple product	: Facebook, Uber
Concierge	: AngleList, AirBnB
Landing page (Fake door)	: Buffer
Wizard of Oz	: Aardwark
Crowdfunding	: Oculus

Have you come across any other types of MVP?

---

# When to use which MVP?

MVP type	When to use
Video (Dropbox)	When product is simple and when it is easy to explain using Video
Simple product (Facebook)	When investment is not high and when experiencing the product is important to get a feel
Concierge - do it manually (AngleList, AirBnB)	When the concept is very new and when developing a simple version is time consuming
Landing page (Buffer)	When you do not have money to develop
Wizard of Oz - do it manually behind the scene (Aardvark)	When developing the product is time consuming
Crowdfunding (Oculus, Popsocket)	When investment is high
Prototype - clickable	When product has many features

What do you think?

# Exercise

---

Which type of MVP would be suitable for these products?

- Online library
  - Software product finder / advisor
  - Apna – job finder for blue collar workers
-

# Possible solution...

Product	MVP type	Justification
Online library	Video, crowd funding	Expensive to develop – storage, data management, tie up with publishers
Sw product finder / advisor	Do consulting to check demand (Concierge)	New concept. Not sure if there is demand
Apna - job finder for Blue collar	Prototype	Need to feel the product Blue collar workers need to see the product before they can say if it is useful & usable



# Experience sharing...

---

What was the MVP of your product?





# Appendix



# Software Product Management

## Build, Measure, Learn & Pivot

**BITS** Pilani

Nandagopal Govindan

# Contents

---

- Build – Turn ideas into product
  - Measure – See how customers respond
  - Learn – What is valuable to customer
  - Pivot or persevere
- 
- Profile: Kate Arnold of Netflix (Inspired)
  - Case study: Slack journey (FirstRound)
  - Case study: “Design Within Reach” (4 Steps to Epiphany)
-

# Introduction

---

- Growth should be measured by the value it creates, not by the funding, amount of advertisement, etc. – Eric Ries of Lean Startup
- Financial valuation of a company may increased for different reasons – venture funding, lack of competition, etc.
- Real growth should be measured by the growth in value to customers

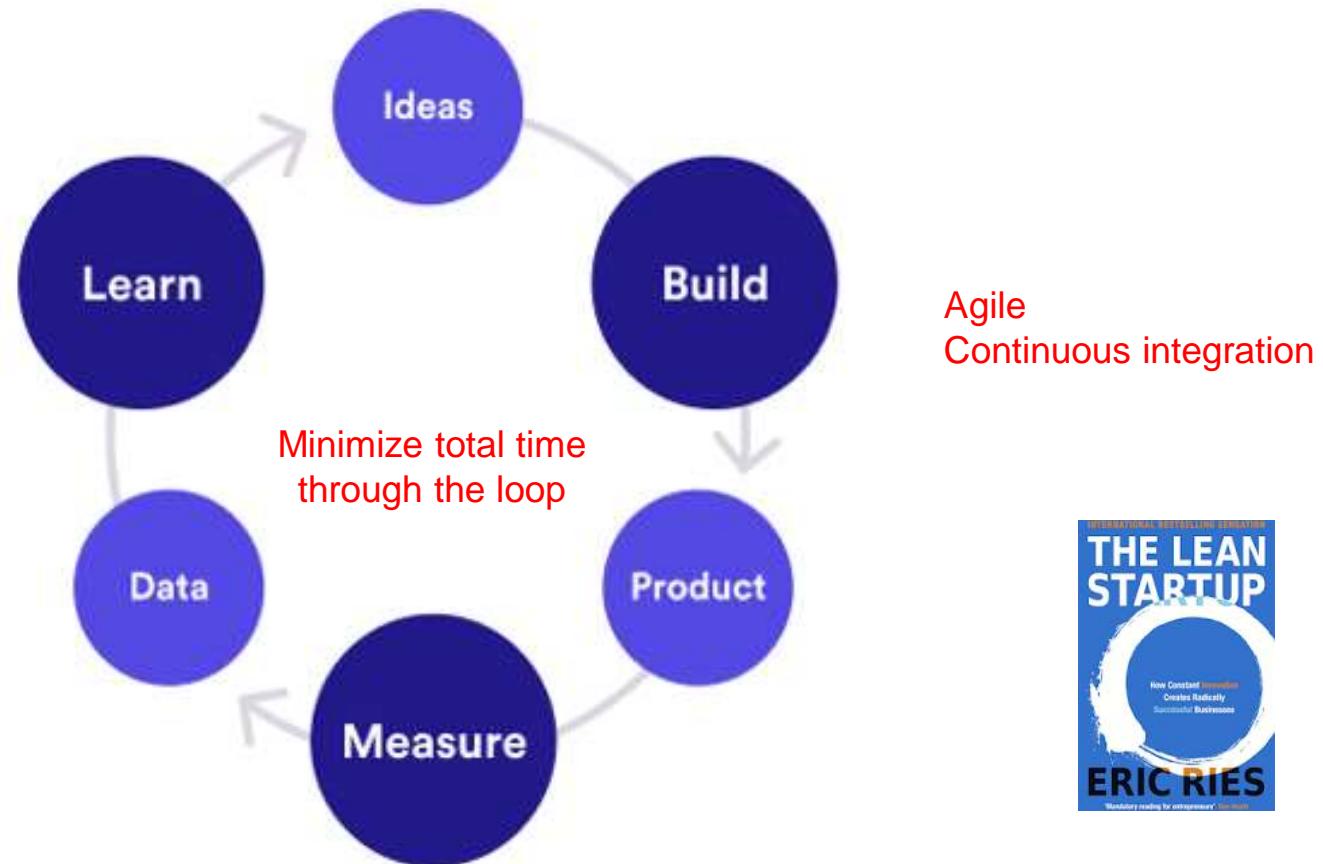
Example:

- Are ecommerce customers finding it convenient shop?
  - Are they finding the products they want?
  - Are the products delivered on time?
-

# Build-Measure-Learn cycle

So we need to constantly learn what is valuable to customers

Customer interviews  
Root cause analysis



- # Visits, conversion, retention
- How many use new feature?

# Build

---

Build the product with minimum features, yet bringing compelling value

Example: Bounce

Minimum feature:

- Book
- Unlock
- End ride
- Pay

Features that can be left out for now:

- Give feedback (assuming there is a call center)
  - View bike model and year of manufacturing
  - Frequent user analytics
-

# Measure

---

Identify the right metric that indicates that customers are getting value from the product

Example:

- # of rides per day in case of Bounce
- # of messages / team in case of Slack

Eric Ries calls this as Innovation accounting (as opposed to accounting profit or review)

---

# Measure ...

---

A disciplined approach is needed to figure out if we are making progress through validated learning

Steps:

- Establish a baseline using real data based on MVP
    - Example: 20 rides per day during MVP
  - Set a desired target: Reach a target of 100 rides in 3 months (based on certain assumptions)
  - Tune the engine, ie. make optimizations (such as UI improvements or adjust price) and measure again to see the difference
  - Pivot, ie. Make change to product feature or change target customer or some other change, if the desired outcomes are not met
    - Example: Provide helmet, Target delivery boys instead of Metro riders (based on a new hypothesis)
-

# Growkit case (Lean Startup)

---



Farbood Nivi was a popular & effective teacher

He discovered that a combination of following approaches is needed effective teaching:

- Teacher led lecture
  - Individual home work
  - Group study (Peer-driven learning)
-

# Growkit case ...

---

## Step1 :

- Used WebEx to teach (Teacher-led learning)
  - Measured # of customers, # of questions answered, etc.
  - Added new ways for students to interact with each other.  
Conducted split (A/B) test. But this did not improve customer behavior.
  - Allowed lazy registration feature. Conducted split (A/B) test. But this also did not have any impact (Optimization)
-

# Growkit case ...

---

## Step2:

- They had missed implementing one important need: Choice of solo learning and group learning
  - Introduced this feature and did A/B testing
  - This led to significant increase in customer behavior
-

# Experience sharing

---

Did you make any changes to the product to enhance value?





# Importance of A/B testing

Do not add a feature unless A/B testing reveals value to customer

# Metrics should be actionable, accessible, auditable

---



## Actionable:

- We should be able to take some action based on the metric. Example:
  - Consider 2 metrics in a gaming software
    - % of visitors who signed up for a gaming software
    - # of chat messages exchanged between players
  - Signup % is actionable. If it is not improving, we can try to investigate and make changes
  - # of chat messages exchanged: This metric is not a very actionable. We are not sure what action to take
-

# Metrics should be actionable, accessible, auditable

---



Accessible:

- The metrics should be easy to understand. Eg. IMUV – a multi-player game
    - How many downloaded
    - How many used trial version
    - How many upgraded to paid version
-

# Metrics should be actionable, accessible, auditable

---

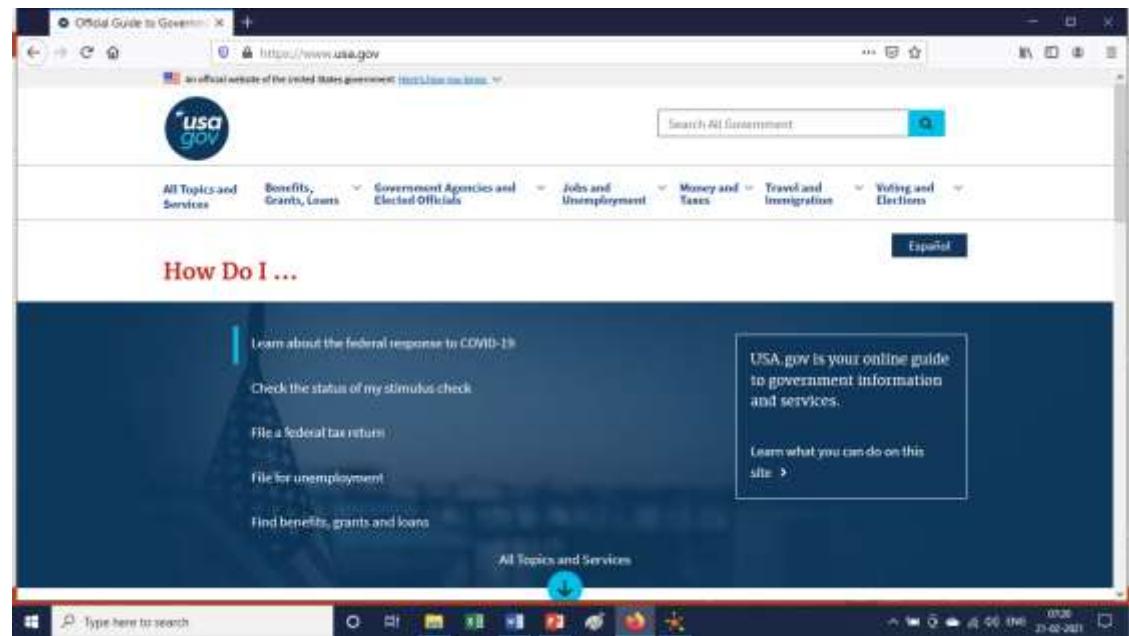


Auditable (verifiable):

- Sometimes when A/B test reveals that a feature is not impactful, some people who proposed the feature do not want to give up and start questioning the veracity (dependability) of the data.
  - They say that the data collected may be inaccurate
  - In such situations it should be possible to know which users preferred the new feature and who did not.
  - Then we can do a random check by calling those people and validating the data.
  - So we need to record customer names and contact details of customers who used the feature and who did not
-

# Votizen case

- David Binetti started Votizen (he was earlier manager of USA.Gov)
- He wanted to tackle the problem of civic participation in the political process



# Votizen: MVP

---

- Hypothesis: People interested in civic matters would like to engage with other similar people
  - Created a social networking platform for verified voters to get together, share ideas, recruit friends
  - Only 5% signed up
  - Tried to make it easier to use. Signup increased by 17% (used A/B testing)
  - He did more optimization. But sign up remained at 17%. Which means the citizens were not getting much value.
  - He had heard recurring feedback that citizens wanted to get more involved
  - So he decided to change the strategy
-

# Votizen: Pivot (Zoom In)

---

- New hypothesis: Passionate activists would be willing to pay for facilitating contacts with elected representatives
  - Converted into social lobbying platform “@2gov” that enabled citizens to reach elected representatives
  - Citizens would use existing social media platform such as Twitter to send message to @2gov and this message would be passed on to the elected representatives on paper since the politicians were less tech savvy
  - Signup increased to 42% but people willing to pay was just 1%. Revenues remained low
-

# Votizen: Pivot (Customer segment)

---



Hypothesis: Large org, non-profit org. and fund raisers who are interested in political campaigning would be interested to contact the elected representatives

- David contacted them and many signed Lol (Letter of Interest).
  - After developing the product, org did not show interest in paying for it ,in spite of multiple follow up
-

# Votizen: Pivot (Platform)

---

- Getting inspiration from Google AdWords platform, he converted the product into a self-serve platform for citizens to send message to elected representatives at 20 cents per message.
  - Revenue increased significantly from 1% to 11%
-

# Votizen: Quick iterations

1<sup>st</sup> MVP took 8 months

2<sup>nd</sup> 4

3<sup>rd</sup> 3

4<sup>th</sup> 1

# Votizen: Lesson

---

- We should not get stuck on our ideas and replace the hypothesis based on new learning about the customer.
  - The company could have got funding and survived but the value would not increase.
  - That is why we must measure the impact of each change and decide if we should pivot or persevere with what we have.
-

# Votizen: Achievements

---

- The company got a funding of \$1.5 million from Facebook's initial investor Peter Thiel.
  - **Startup Visa campaign used Votizen which resulted in the Startup Visa Act (S.565).**
  - This was the first legislation introduced via social lobbying.
-

# Types of pivots

---

- Zoom in: One feature blown up
  - Zoom out: Many features combined into one as there is not much interest in so many features. Example
  - Customer segment: Individual or Organization
  - Customer need (through customer intimacy)
    - Eg. Pot Belly sandwich which started as an antique store (1977) gave sandwiches to customers to make them stay. But they found that customers like sandwiches more than antiques
  - Platform pivot: A specific use application to a platform (like AirBnB)
  - Channel pivot. Instead of selling a product via consulting firms, a company may decide to sell directly (SaaS).
  - Business architect pivot: Low volume high margin to High volume low margin. Example Clinic shampoo Sachet
  - Technology pivot: Same solution using different technology (eg mobile) this is used by large corp to improve their service.
  - Engine of growth pivot: Viral, sticky or paid growth
-



# Experience sharing...

---

What pivots did you use in your product to enhance value?



# Pivot case study: Netflix

---



Netflix - Kate

1. What was the solution used by Kate to address the problem of customers not bothering to return the DVD?
  2. How did they address the issue of needing to stock popular & expensive DVDs which were in high demand?
  3. What can we learn about the role of Product manager from this story of Kate?
-

# End-to-end Case study



Slack

What lessons can we learn from Slack in the area of:

1. MVP
2. Pivot
3. User vs Buyer
4. Identifying product features
5. Marketing & growing the market
6. Customer support
7. Strategy
8. Metrics & Analytics

# End-to-end case study

---



Design within  
reach

1. What was the pain point Rob was trying to address?
  2. What was the MVP he used?
  3. Why did Rob refuse to start e-com business?
-



# Appendix



# Software Product Management

## Rapid solutioning – Sprint technique

**BITS** Pilani

Nandagopal Govindan

# Contents

---

- Map the problem
  - Sketch the solution
  - Choose the best solution
  - Storyboard
  - Prototype
  - Test
-

# Introduction

---

- Quick solutioning & testing its effectiveness is important
  - Sprint is technique developed by Jake Knapp who used this technique in Google
  - He found ‘Sprint’ more effective than brainstorming to find solutions to problems, irrespective of the product – software, robot, healthcare
  - In brainstorming, he observed that much time was spent in discussing pros & cons of each solution. Also he found that resulting solutions were not always the best (**Why?**)
-

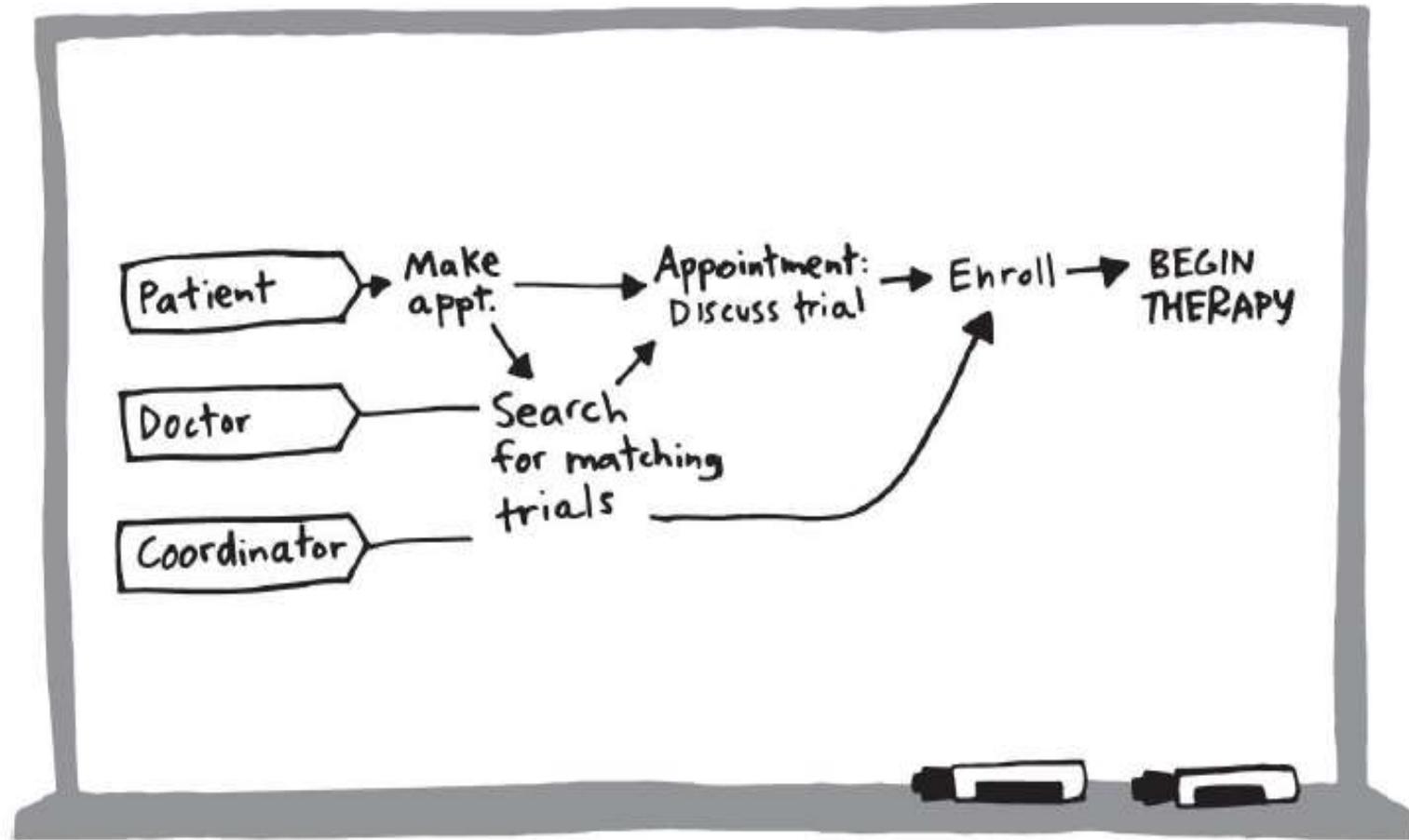
# Idea in brief...

---

1. Map the problem: Draw a high level process map (swim lane), identify the key challenges to be addressed in the process
  1. Sketch the solution: Create rough solutions – one per team member
  1. Choose the best solution: Identify stand-out ideas in each solution, by voting
  1. Storyboard: Create a storyboard by putting together the standout ideas
  1. Prototype: Create a prototype – PPT, video, mockup, wireframe, etc.
  1. Test: Show to potential users and get feedback
-

# Steps in detail...

# Map the problem



Process for enrolling patients for drug trials

# Flatiron

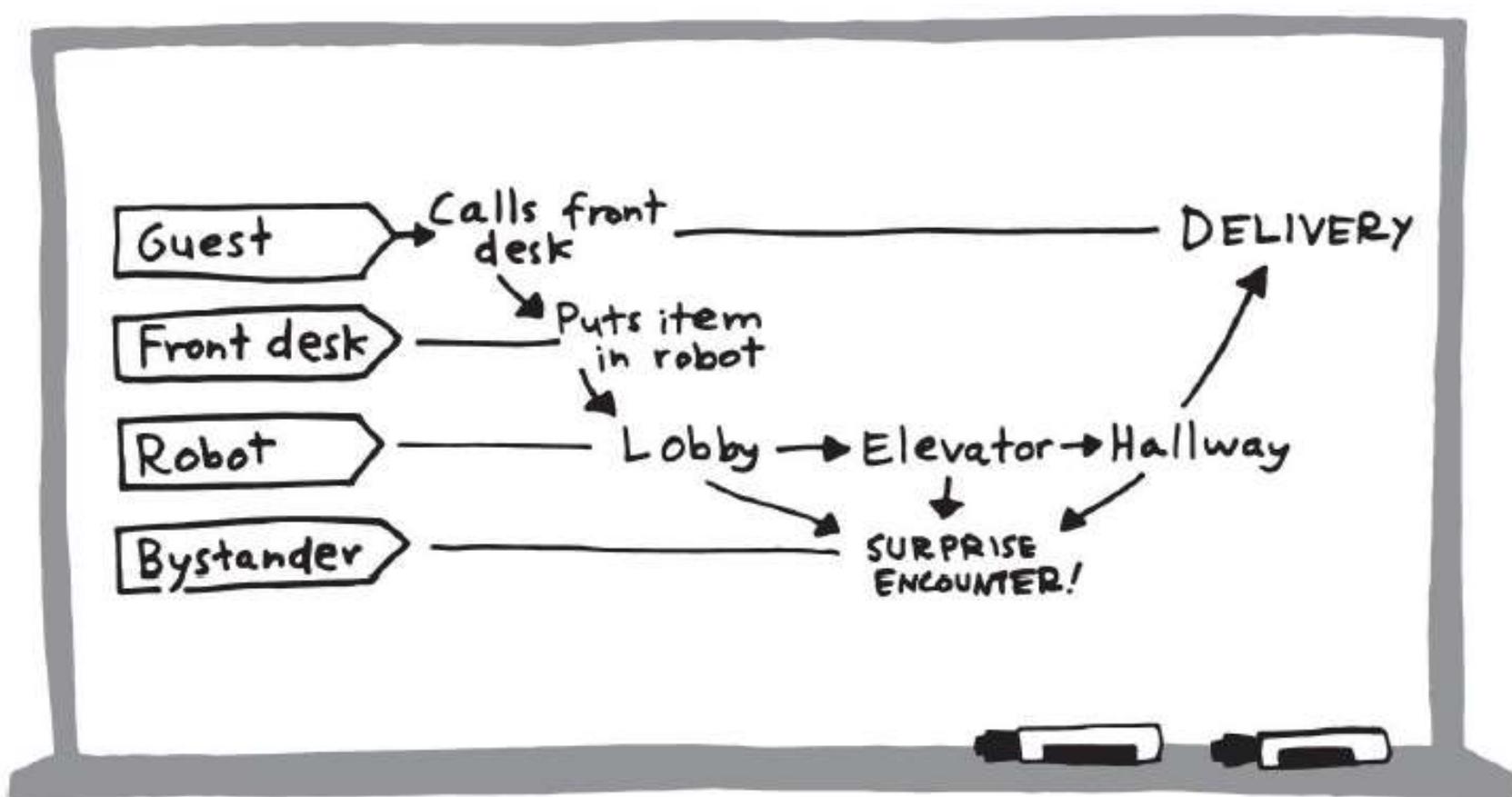
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- Flatiron is a health care company that analyses medical records and test data of cancer patients and help doctors to choose the right treatment.
  - Objective: Increase enrolment in clinical trials for new drugs (medicines)
  - **Problem: Only 4% of cancer patients enrol for clinical trials. Increased enrolment would increase the collection of data about cancer treatment data which can be used by doctors to better treat future patients**
  - There are different types of trials: Trials for drugs for common types of cancer, trials for drugs for rare forms of cancer. The types of trials are very many and it is hard to track humanly.
  - To determine which trial a patient should undergo (match), the doctors have to go through a lot of data such as treatment history, blood count, DNA mutations in cancer cell, and much more.
-

# Map for Robot server in hotel

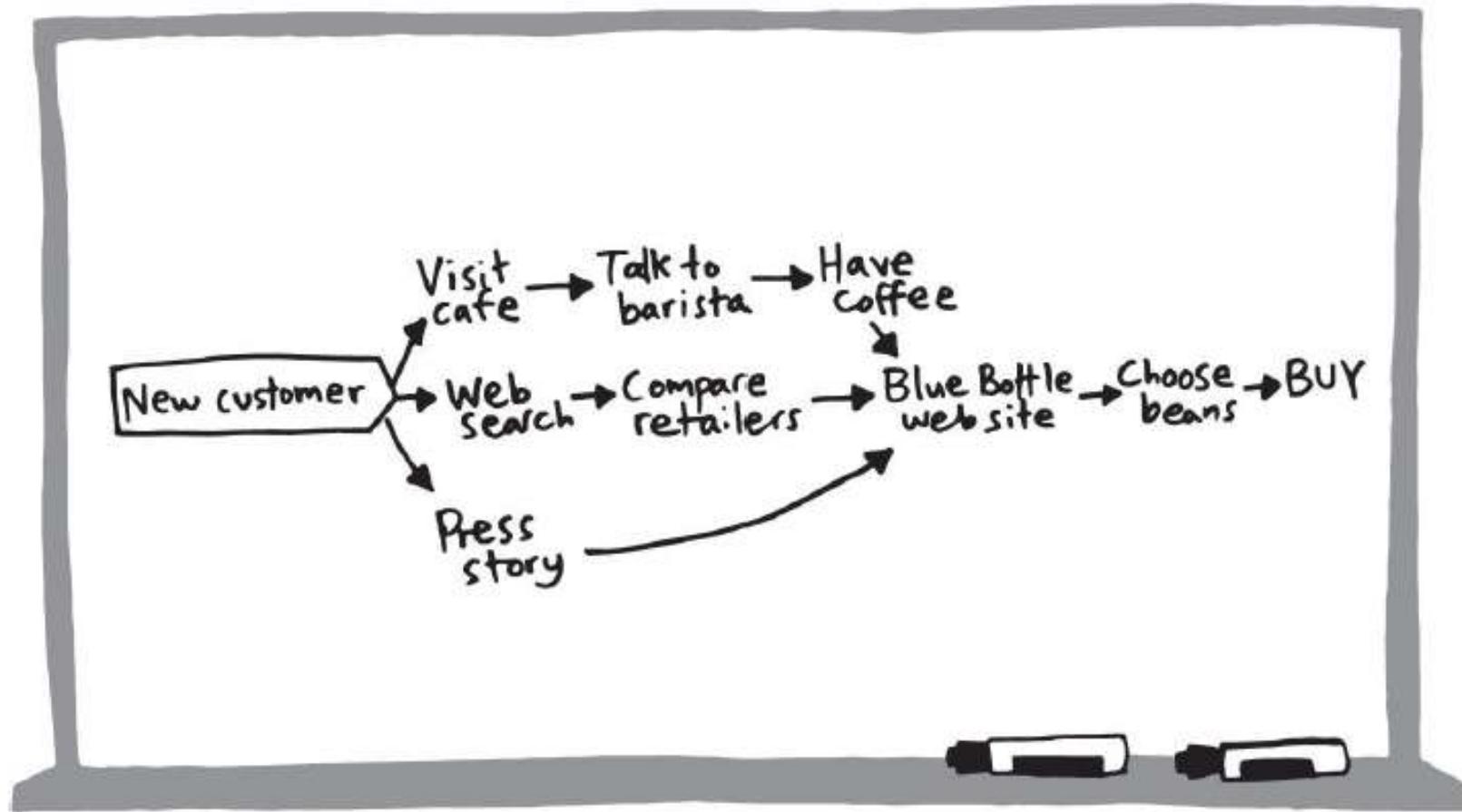


Picture of robot



*Savioke's robot delivery map.*

# Map: Online coffee sales

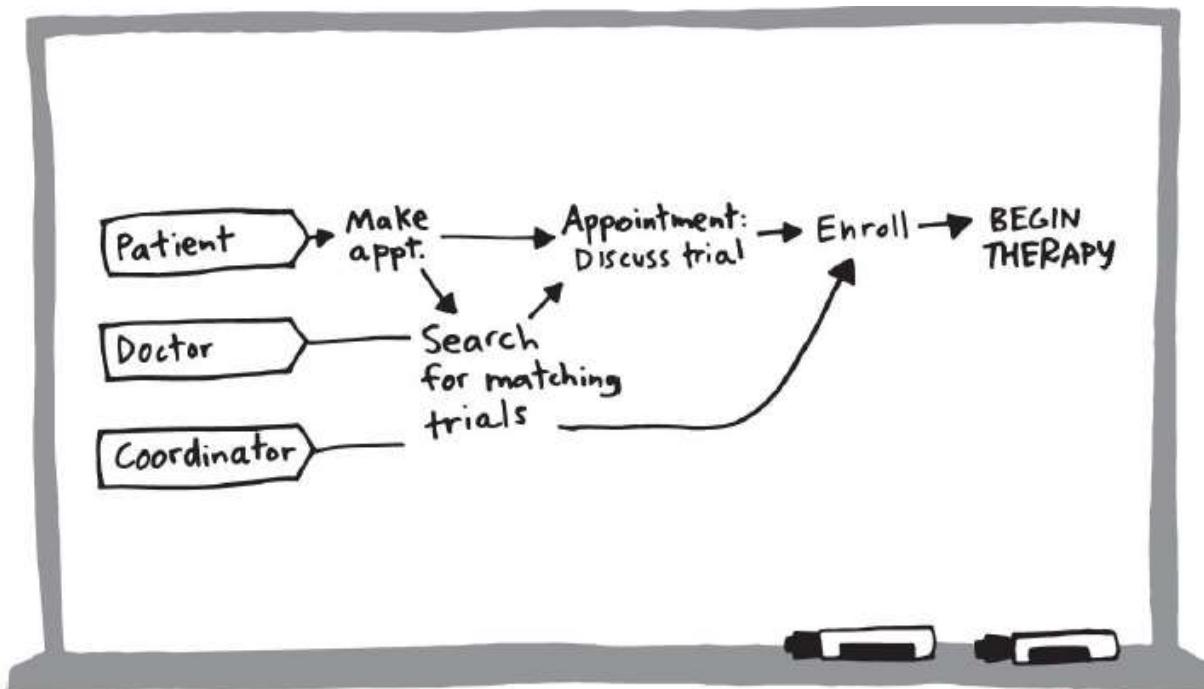


Blue Bottle Coffee's online sales map.

# Map: Identify the key challenges to be addressed

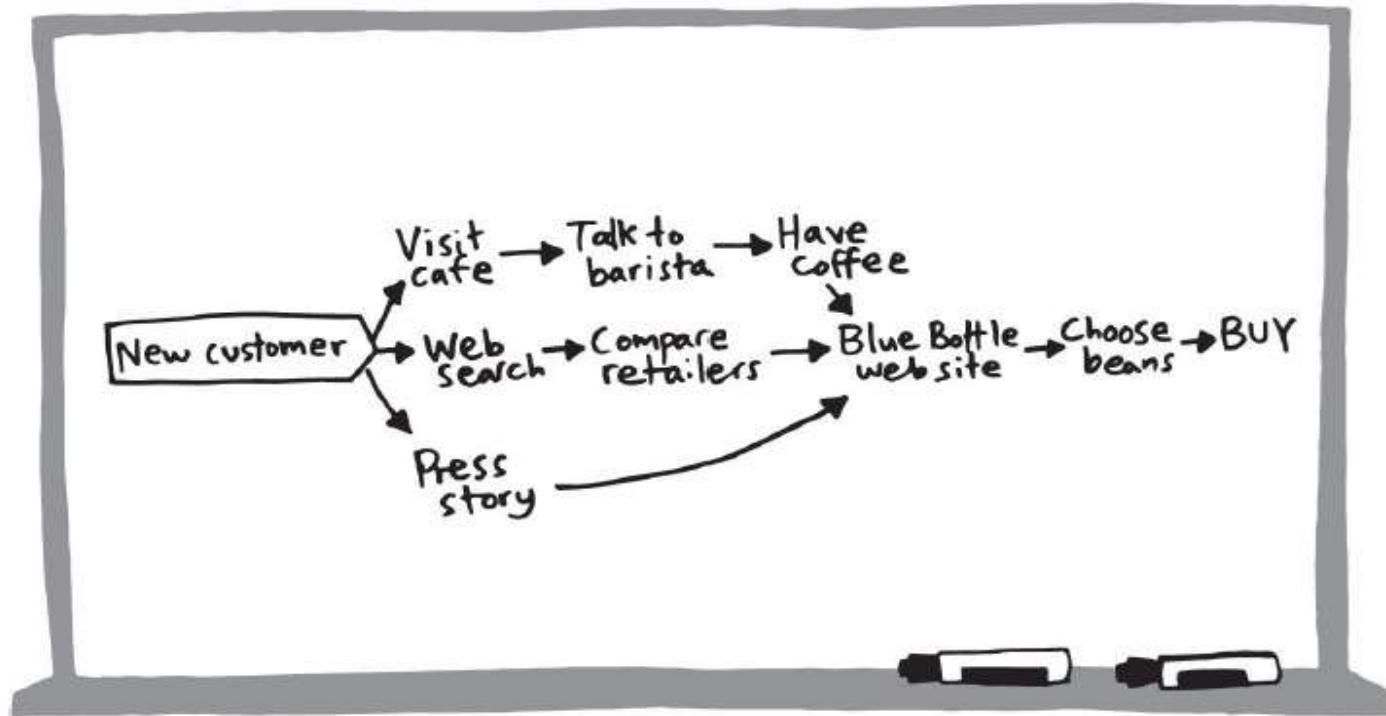


HMW: How may we?



# Map: Identify the key challenges to be addressed

How may we make it easy for customers to re-order?



*Blue Bottle Coffee's online sales map.*

# Exercise

---

AirBnB: How may we questions:

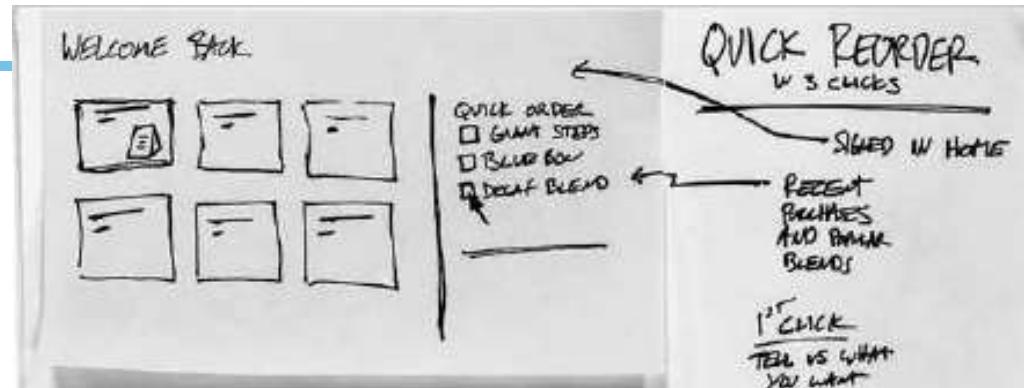
What are the key challenges AirBnB needs to answer for their offering – stay in a house instead of staying in hotel?

- How may we make it super easy to book a place to stay?
  - How may we create trust between two complete strangers?
-

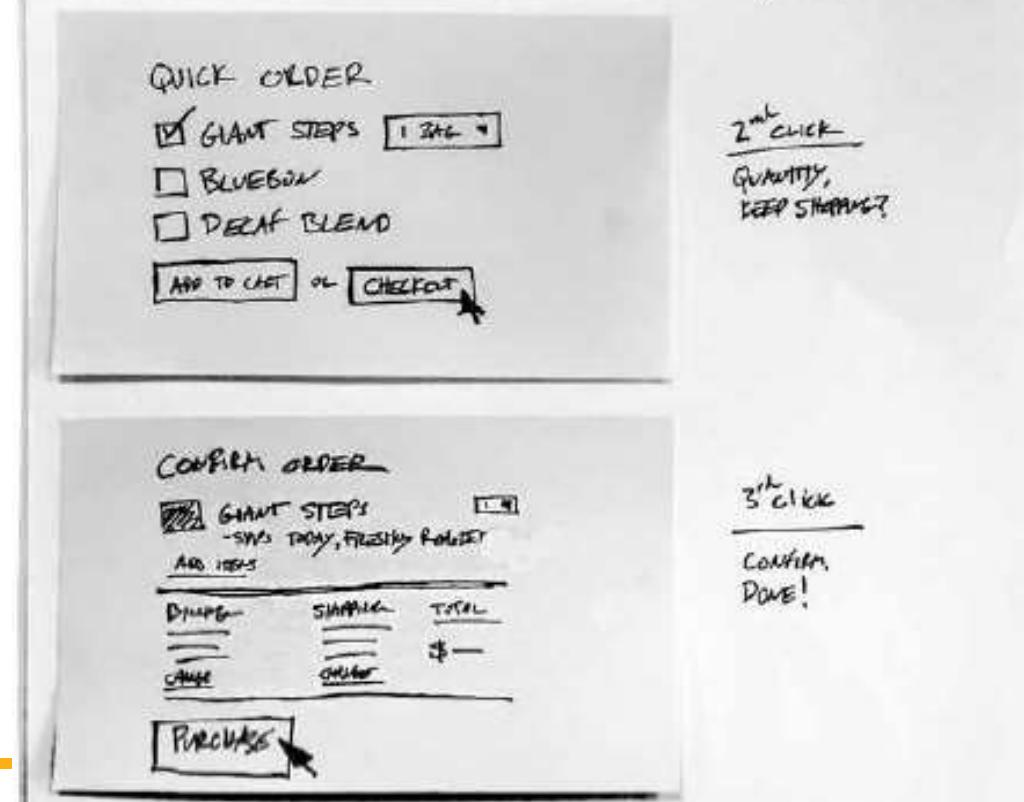
# Sketch the solution

How may we make it easy for customers to re-order?

Step 1

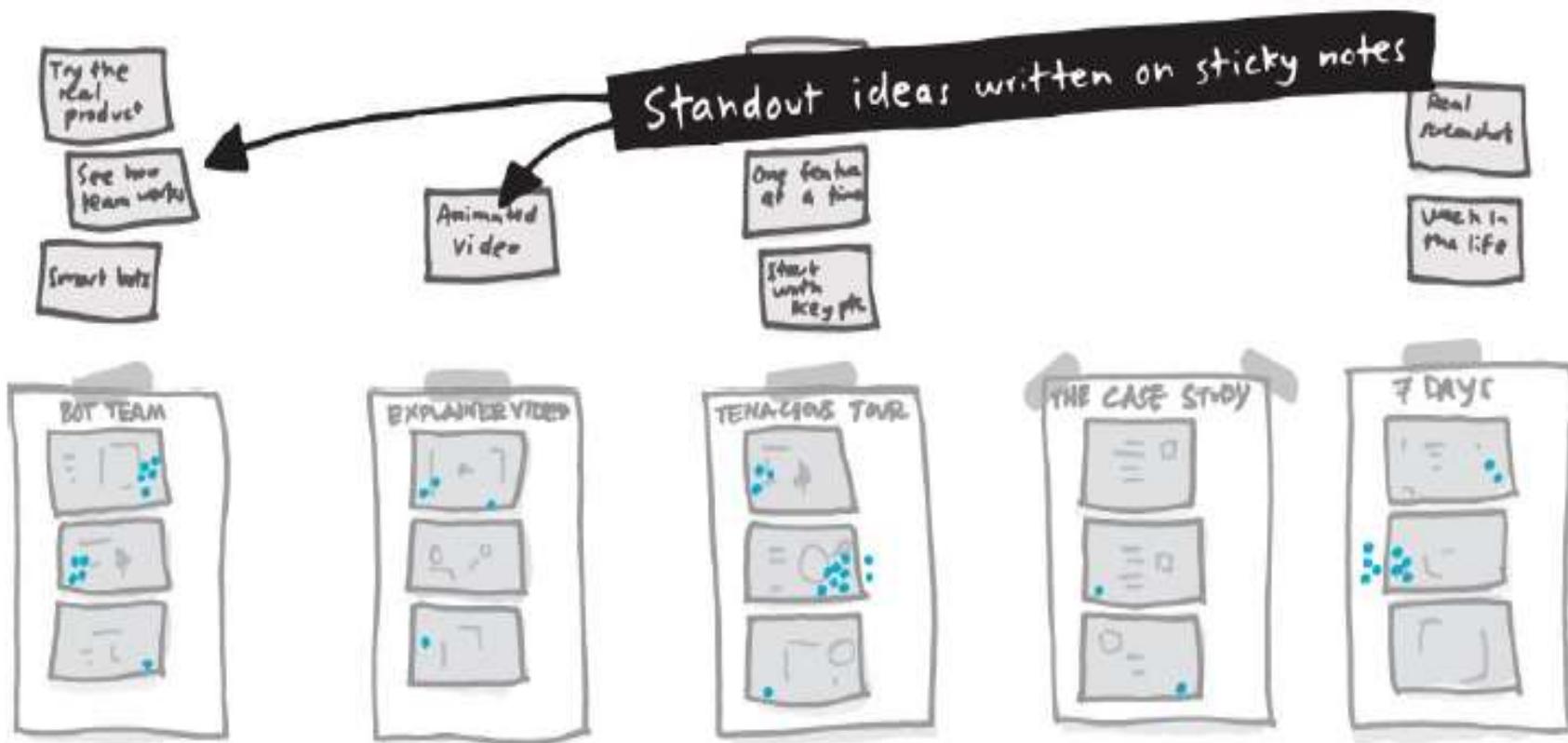


Step 2



Step 3

# Identify standout ideas by voting



# Create Story board

---

- Pick the best solution based on votes. Product manager gets extra voting rights
  - If there are some stand out ideas in another solution, try to integrate the idea into the best solution
  - Put together story board of the final solution
-

# Create a prototype

---

- Divide prototyping work among team members
  - Prototype can be a video, mockup, wireframe, etc.
  - Build the prototype: Assemble the parts
-

# Test the prototype to get customer feedback

---



Studies have shown that 5 users are enough to get 80-90% feedback

- Understand customer background
  - Introduce prototype
  - Let customer use the prototype while someone takes notes
  - Quick debrief: Good aspects, aspects to improve
-

# Test: In detail...

Studies have shown that 5 users are enough to get 80-90% feedback

## Welcome

- Thank for coming
- We are trying to improve our product,...
- I will be asking a lot of questions as you use the product but I am not testing you, I am testing the product
- If you get stuck or confused, it is not your fault. It helps us find problems.
- I will start by asking some background questions, then I will show you somethings we are working on

## Understand customer background

- What kind of work do you do?
- How long have you been doing that?
- What do you do when you are not working?
- Have you used any products to ....? What did you want them to do for you? What do you like or dislike about them?

## Introduce prototype

- Would you be willing to look at some prototypes?
- Some things may not work quite right yet – if you run into something that is not working, I will let you know
- Remind the customer, you are not testing the customer
- Encourage the customer to think aloud as she uses the product – say what she is trying to do, how she plans to do, share what she likes, what she is confused about, etc.

## Let customer use the prototype while someone takes notes

- Ask questions to understand what the customer thinking or getting stuck about

## Quick debrief

- What did you like about the product, what did you dislike?

# Case study: Slack

---

- Slack messaging software had become **hugely successful in tech companies**. 500,000 users were using it for one-on-one messaging, chat room messaging,.. It had changed the way teams communicate. It had integrations with lots of other application and had become a hub.
  - Now Slack **wanted to expand to non-tech companies**. The marketing had not made much impact. So they got together to use Sprint approach to answer the questions – **what is the best way to explain what Slack can do for you?**
  - The team came up with 2 competing ideas – tenacious tour and Bot. They developed a prototype for each. **One was a step by step explanation of Slack usage. Another was a mock up of a Bot** – messages typed by the user will be answered by a Slack employee at the other end mocking a Bot.
  - The team showed these prototypes to 2 sets of users. **The tenacious tour got better feedback** though with some room for improvement. Thus they **avoided the effort of developing the Bot** which would have been quite expensive.
-

# Exercise

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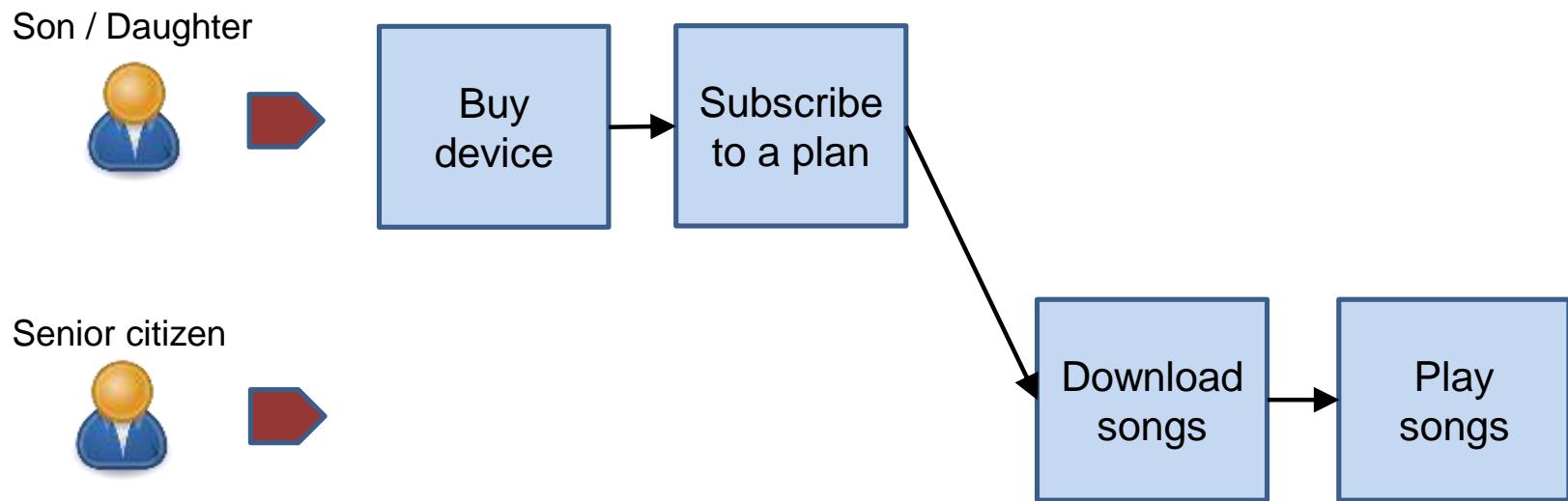
Product: Digital music player device for senior citizens

1. What are the key questions / challenges?
  1. Sketch a solution / UI for downloading a song and storing it in the device
-

# Exercise: Digital music player device for senior citizens



## Map (Swim lane)



1. What are the key questions / challenges? Let us now prioritize the challenges  
<https://docs.google.com/document/d/1PX7yRRSwWluzKA5pFy7kc3P861kdWhOQI8DBW8Nu0ew/edit?usp=sharing>

1. Sketch a UI solution for downloading a song. Let us vote for the best solution.

# Example of HMW questions

---



HMW questions: How may we make it easy for senior citizen to

1. Search & download a song or a set of songs, for example all songs from the Hindi film “Anand”?
  1. Search & play a downloaded song?
-

# Exercise...

---

1. Sketch a UI solution to search for & download a song
2. Then copy paste your UI solution in the same document

<https://docs.google.com/document/d/1PX7yRRSwWIuzKA5pFy7kc3P861kdWhOQI8DBW8Nu0ew/edit?usp=sharing>

1. Then let us vote for the best solution.
-

# Key learnings

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What are the key learnings from this “Sprint” technique?





# Appendix



# Software Product Management

## Principles of UX design

**BITS** Pilani

Nandagopal Govindan

# Contents

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- Dimensions of Usability (Jakob Nielsen)
  - Steps for UI design
  - Different aspects of UX design
  - Evaluating UX – Nielsen's heuristics
-

# Introduction

---

Have you come across User interfaces that exhibit the following:

- Unintuitive and hard to use.
  - You can't find what you're looking for
  - You're not clear what to do next.
-

# Introduction

One way to evaluate UX is to consider how much it helps or hinders the functionality / features in realizing the value proposition (the desired customer benefits) (Product – Market fit pyramid)





# Dimensions of Usability

---

- **Learnability:** How easy is it for users to accomplish basic tasks the first time they encounter the design?
  - **Efficiency:** Once users have learned the design, how quickly can they perform tasks?
  - **Memorability:** When users return to the design after a period of not using it, how easily can they re-establish proficiency?
  - **Errors:** How many errors do users make, how severe are these errors, and how easily can they recover from the errors?
  - **Satisfaction:** How pleasant is it to use the design?
-

# Dimensions of Usability



Consider the following:

- Learnability: How quickly can you learn to use these - washing machine, Gmail, online banking
- Efficiency: How efficiently can you accomplish your task using these – MS Word, 50 process templates to choose from in Kissflow
- Memorability: How long does it take to use these when you return again to use them - Airport kiosk to print boarding pass, Movie theatre kiosk to print ticket
- Errors: How many errors do you make while buying a product on Flipkart?
- Satisfaction: How pleasant was your experience using MakeMyTrip.com?



# Exercise: Give examples



Dimension	Good product example
Learnability	
Efficiency	
Memorability	
Error	
Satisfaction	

# Exercise



Comment on the “Efficiency” dimension of booking an flight ticket in MakeMyTrip.com

Online Shopping site in India Makemytrip

https://www.makemytrip.com/flight/search?itinerary=DEL-BLR-25/02/2021&tripType=OneWay

make my trip Flights Hotels Villas & Apts Holidays Trains Buses Visa Cars Charter Flights More Login or Create Account

TRIP TYPE: One Way FROM: Delhi, India TO: Bengaluru, India DEPART: Thu, Feb 25, 2021 RETURN: PASSenger & CLASS: 1 Adult, Economy / Premium SEARCH

Popular Filters

- IndiGo (72) ₹ 6,867
- Morning Departures (58) ₹ 6,867
- AirAsia (31) ₹ 6,868
- Non Stop (27) ₹ 5,608
- + 5 more

One Way Price

₹5,608 ₹21,000

Stops From New Delhi

- Non Stop (27) ₹ 5,608
- 1 Stop (105) ₹ 6,868
- 1+ Stop (18) ₹ 8,774

Departure From New Delhi

Flights from New Delhi to Bengaluru

Thu, Feb 25	Fri, Feb 26	Sat, Feb 27	Sun, Feb 28	Mon, Mar 01	Tue, Mar 02	Wed, Mar 03	Thu, Mar 04
₹ 5,608	₹ 6,867	₹ 6,867	₹ 6,867	₹ 6,867	₹ 6,867	₹ 5,608	₹ 4,569

Sorted By: Departure Duration Arrival Price

Carrier	Departure	Duration	Arrival	Price	Action
IndiGo	05:00	06 h 35 m	11:35	₹ 6,920	<a href="#">VIEW PRICES</a>
AirAsia	05:05	10 h 40 m	15:45	₹ 6,868	<a href="#">VIEW PRICES</a>
IndiGo	05:05	05 h 05 m	10:10	₹ 6,920	<a href="#">VIEW PRICES</a>

Type here to search

06:21 24-02-2021

# Basic steps

---

1. Design the overall structure
  2. Consider the different scenarios (use cases)
  3. Design navigation & screens for each scenario
-

# Example: Overall structure



Online Shopping site in India MakeMyTrip - #1 Travel W+ https://www.makemytrip.com 150% ... Login or Create Account IN NEW

make my trip My Trips 24x7 support my Biz Introducing myBiz MakeMyTrip for Business Login or Create Account IN NEW

Flights Hotels Villas & Apts Holidays +Cruise Trains Buses Visa Cabs Charter Flights

ONEWAY  ROUND TRIP  MULTI CITY

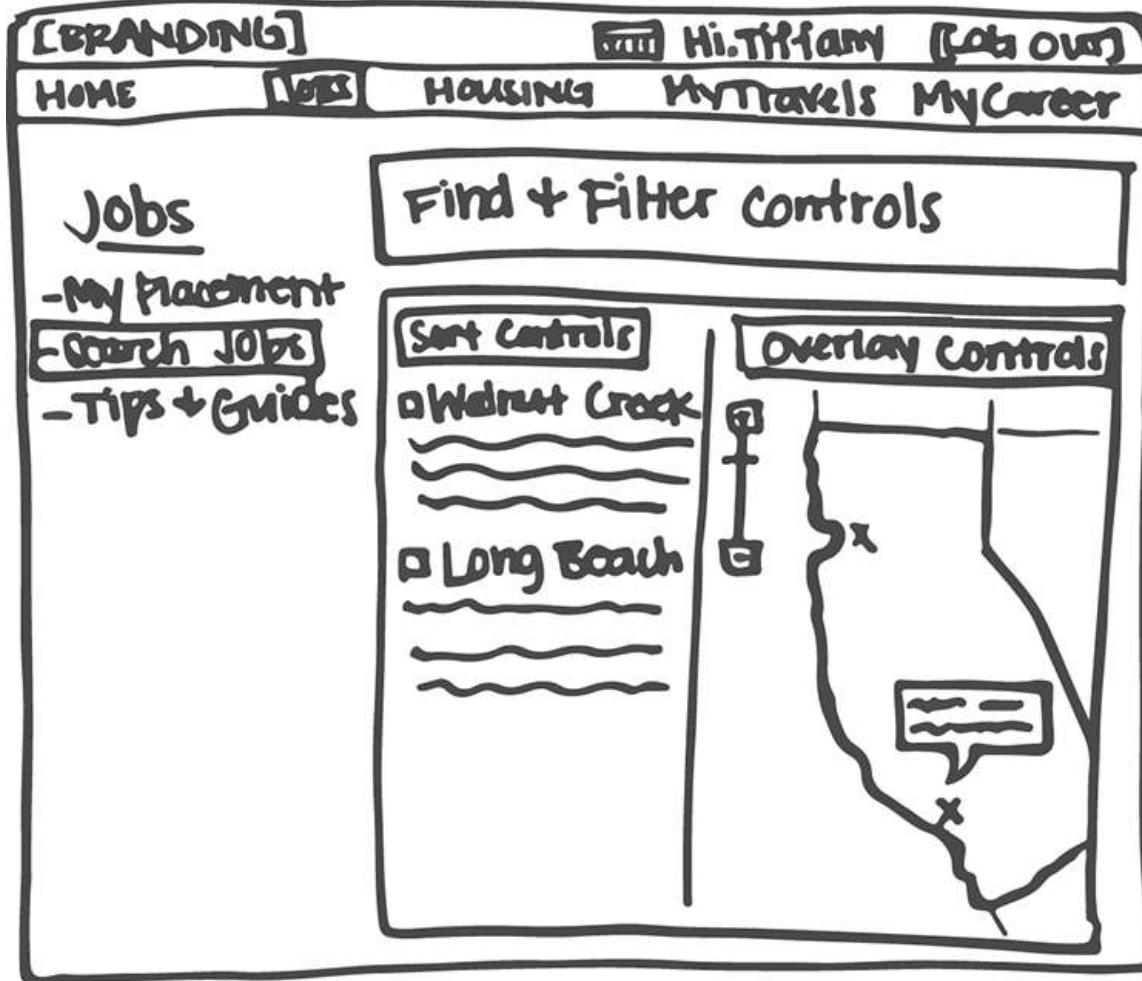
FROM TO DEPARTURE RETURN  
**Delhi** **Bangalore** 25 Feb'21 Tap to add a return date for bigger discounts  
DEL, Delhi Airport India BLR, Kempegowda International Airp...

STUDENT FARE Trending Searches: Chennai → Hyderabad Bangalore → Singapore Delhi → Kolkata

WE ARE HERE TO HELP. airlines & hoteliers to make informed decisions →

SEARCH date changes →

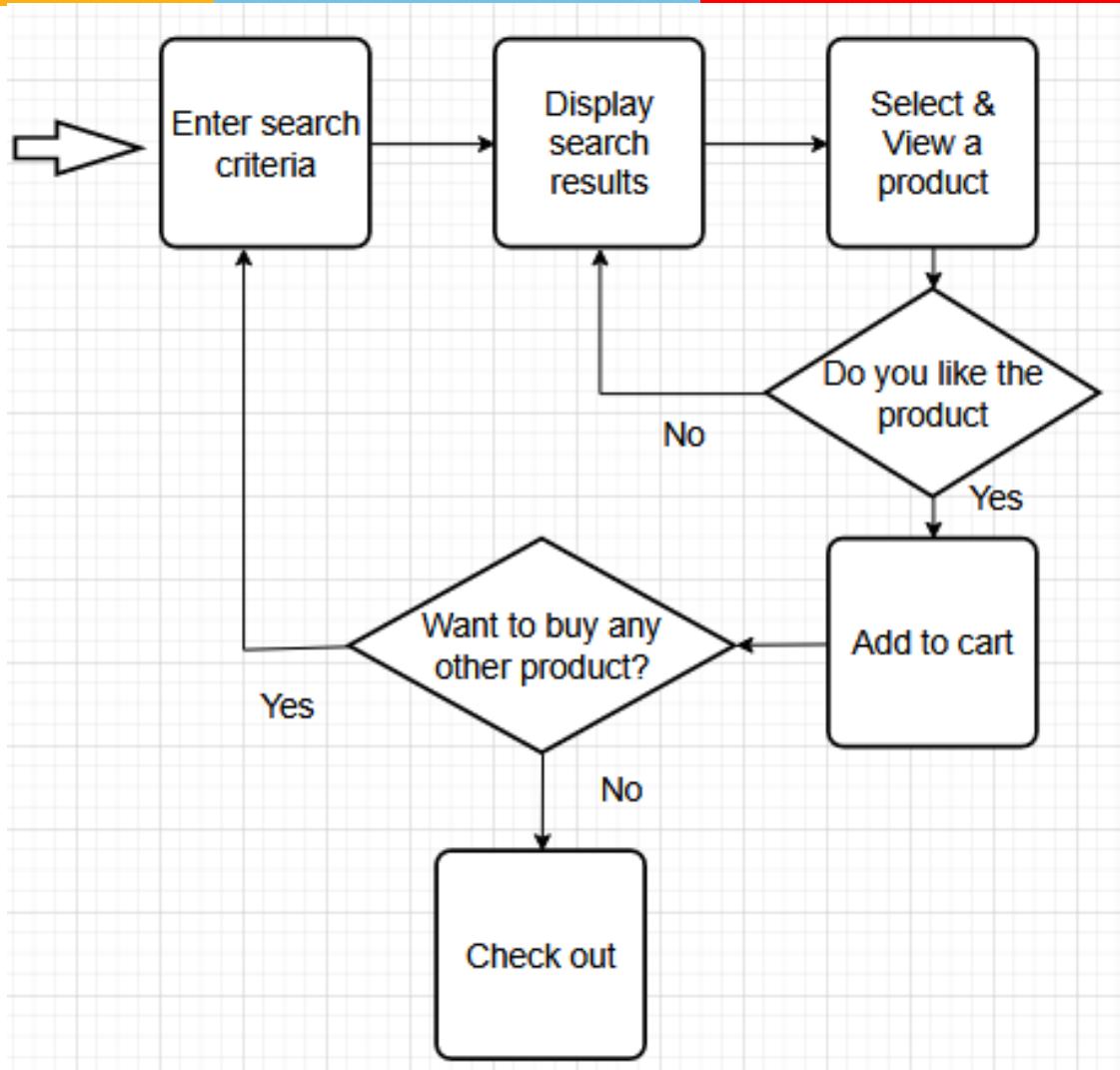
# Example: Sketch of overall structure



Portal for travelling nurses

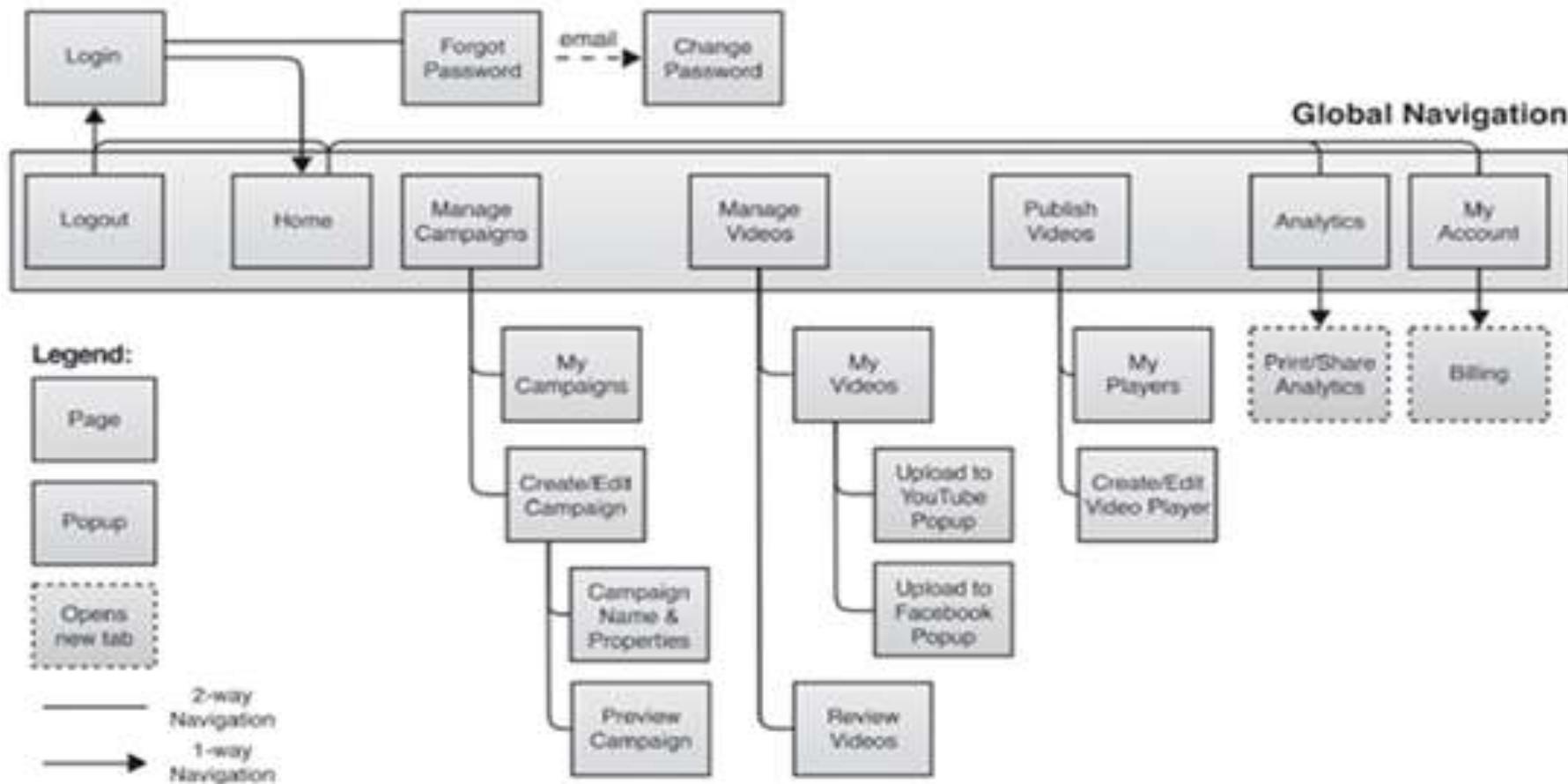
- Show different areas using rectangles
- This is an iterative process

# Example: Scenario: Searching & selecting products to buy





# Example: Navigation





# Example: Screen design

**Calculation**

Period  Scenario  Year

Run All Rules

Specify Rule Set Range

Select First Rule set

Select Last Rule set

Stop After Rule

Rule Set Name

Rule Name

Run a single Rule from a RuleSet

Select RuleSet

Select Rule

**Notification**

Allocation Rule2 is P 58% complete

Today at 11:30 AM: Database Deploy C

Today at 10:54 AM: Allocation Rule1 Cor



# Example: Screen design

## Calculation

Select the required POV and click on the 'Refresh' button.

Period  Scenario  Year  Version  Refresh 

### Calculation Parameters

Job Comment

### Processing Range

Run All Rules

Specify Rule Set Range

Select First Rule set

Select Last Rule set

Stop After Rule

Rule Set Name

Rule Name

Run a single Rule from a RuleSet

RuleSet Name

Rule Name



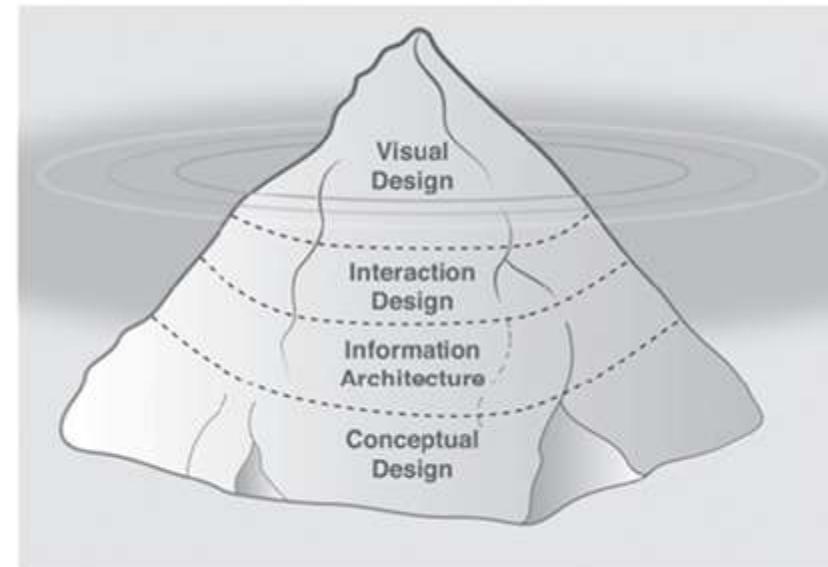
# Ideal sequence for design



Sketch => Wireframe => Lo-fi Prototype => Hi-fi Prototype => Code

# Different aspects of creating UX

- Conceptual design
- Information architecture
- Interaction design
- Visual design



# Conceptual design

---

Should resonate with how the users think (Mental model)

Examples:

- Quicken used checkbook as a metaphor, which customers found very intuitive.
- Uber's conceptual design was to show users the location of nearby cars in real time:
- Tally: User's language not Accountant's language
- MakeMyTrip: Steps to book ticket match users expectations

Need to understand users and their goals (personas)

- How tech savvy is the customer?
  - What is the age?
  - What is the environment in which he will be using the product (in a car while driving, in a noisy factory)
-

# Exercise: Conceptual design



- Comment on the conceptual design of the “Funds transfer” feature of your bank’s online banking software



# Information architecture

- Deals with how you organize information on the screen
- Findability is a key measure
- Organize features, label them in a way that is easy to understand
- Organize in sections and screens within sections (Site map)
- Global navigation pattern

# Information architecture: Example of bad design



How you like this screen design?

Form Title - (appears above URL in most browsers and is used by WWW search)	Background Color:	
Q&D Software Development Order Desk	FFF8B0	
Form Heading - (appears at top of Web page in bold type)	Text Color:	
Q&D Software Development Order Desk	<input checked="" type="checkbox"/> Center	000080
E-Mail responses to (will not appear on	Alternate (for mailto forms only)	Background Graphic:
dversch@q-d.com		<input type="checkbox"/>
Text to appear in Submit button	Text to appear in Reset button	<input type="radio"/> Mailto
Send Order	Clear Form	<input checked="" type="radio"/> CGI
Scrolling Status Bar Message (max length = 200 characters)		
***WebMania 1.5b with Image Map Wizard is here!!***		
<a href="#">&lt;&lt; Prey Tab</a>	<a href="#">Next Tab &gt;&gt;</a>	



# Exercise: Info architecture

---



Comment on the “Findability” aspect of your bank’s online banking software

How easy or difficult it is to find the following features:

- a) Order cheque book
  - b) Block debit card
  - c) Access Form 16
-



# Interaction design

Deals with:

- What actions can the user take at each step, and how will the product respond?
- How will the user interact: click, hover, drag, type, tap, swipe, etc.
- What navigations needs to be provided?
- Depicting the state, such as - Product selected, checkout, payment
- How does the product provide feedback?
  - Error messages,
  - confirmation,
  - acknowledgement for pressing a button,
  - wait indicators (hour glass),
  - progress bar,
  - 'you are here' indicator in a multi step process
- **Which product you have used that gives good feedback?**

# Customer journey mapping (different touch points)



A **customer journey** is the end-to-end process that a customer goes through in order to complete a task over time

Customers interact with an application using multiple devices – laptop, smart phone, kiosk – and in multiple ways – email, browser, sms. (touch points)

Example: Airline travel

- Book ticket using laptop
- On day of journey, the airline sends me a notification to check in
- I show my phone boarding pass at gate
- I print boarding pass on kiosk
- If there's a flight delay, I'm updated immediately by text message or email.

# Exercise: Customer journey mapping

---



Can you give example of customer journey mapping for  
Customer complaint of lost credit card?

---

# Visual design (Graphic design)

---



Deals with:

- Colour (highlight, borders, title)
  - Hierarchies (Heading, sections, ...)
  - Brand personality (Company logo)
  - Fonts
  - Images (AirBnB)
  - Icons (Save, Edit, ...)
  - Style guide for consistent design
-



# Visual design: Hierarchy

(A)

## Create a Clear Visual Hierarchy

Organize and prioritize the contents of a page by using size, prominence, and content relationships. Let's look at these relationships more closely. The more important a headline is, the larger its font size should be. Big bold headlines help to grab the user's attention as they scan the Web page. The more important the headline or content, the higher up the page it should be placed. The most important or popular content should always be positioned prominently near the top of the page, so users can view it without having to scroll too far. Group similar content types by displaying the content in a similar visual style, or in a clearly defined area.

(B)

## Create a Clear Visual Hierarchy

**Organize and prioritize the contents of a page by using size, prominence, and content relationships.**

Let's look at these relationships more closely:

- **Size.** The more important a headline is, the larger its font size should be. Big bold headlines help to grab the user's attention as they scan the Web page.
- **Prominence.** The more important the headline or content, the higher up the page it should be placed. The most important or popular content should always be positioned prominently near the top of the page, so users can view it without having to scroll too far.
- **Content Relationships.** Group similar content types by displaying the content in a similar visual style, or in a clearly defined area.

# Evaluating design: Nielsen's heuristics



- Simple & Natural dialogue – minimize concepts, match user's mental model
- Speak user's language – avoid codes such as 44 for UK, 1 for US, avoid technical terms such as memory overflow
- Minimize user memory load - Use menus and drop downs
- Consistency – Example menu items across Word, Excel, Powerpoint
- Feedback – Confirmation of action, Progress indicator
- User control & freedom – Example Home, Back, Undo, Redo
- Clearly marked exits – Cancel, Logout
- Shortcuts – Ex. Word shows last files opened, prefill preferences, default values
- Good error messages – Precise and helpful: Can not open file Chapter 5 because it is not on disk". It is possible that the file has been moved to new directory or might have been renamed"
- Prevent errors – Example Drop down values, Calendar to select date, Describe the format ex. dd-mmm-yyyy 2-Oct-2048, Make primary action prominent
- Help & Documentation – Task oriented search





# Summary

We looked at:

- 5 dimensions of Usability: Learnability, Efficiency, Memorability, errors & Satisfaction
- 4 aspects of design: Conceptual, Information architecture, Interaction design, Visual design
- Evaluation heuristics of Nielsen

# Question

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What are the key learnings from this session?



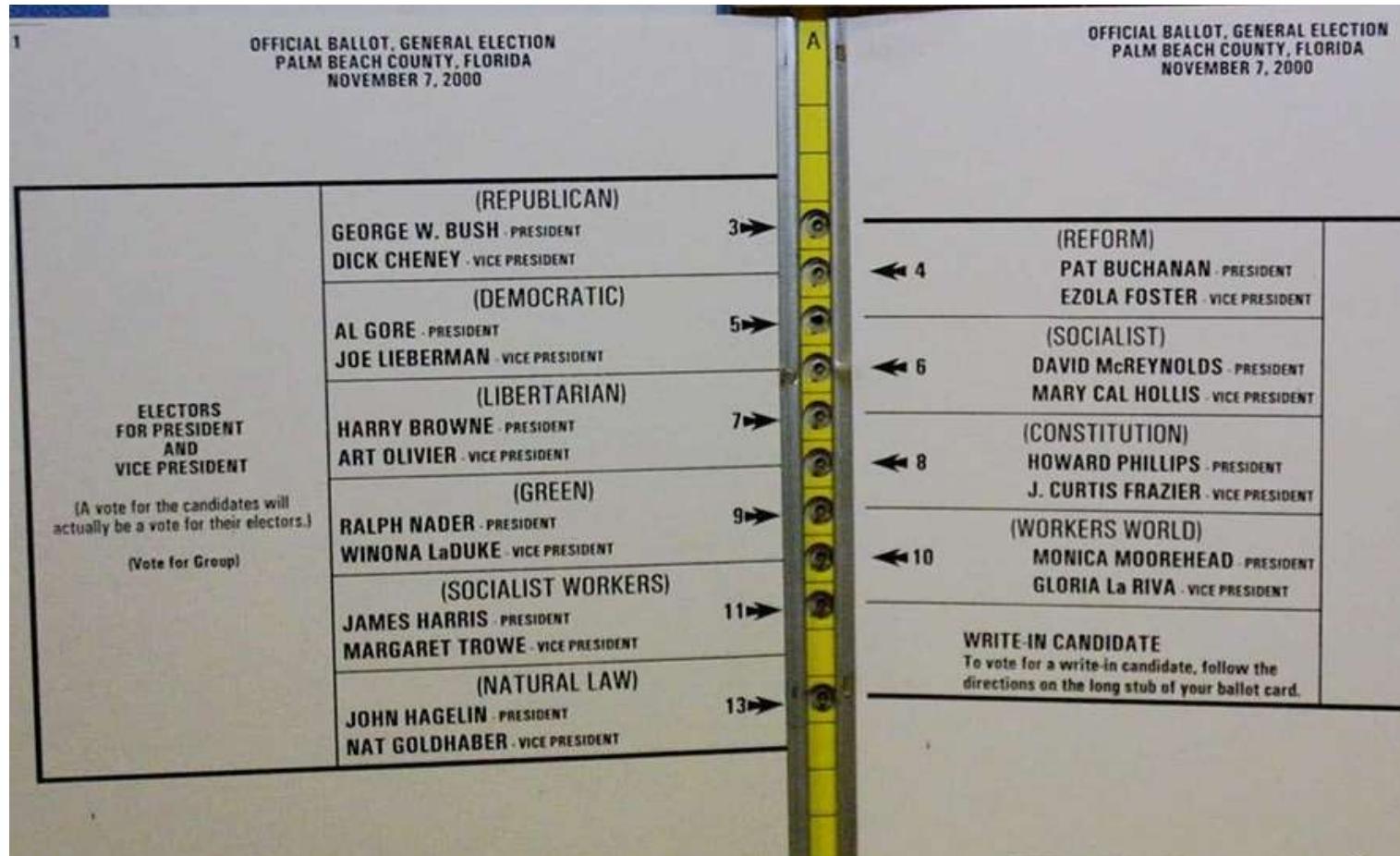


# Appendix

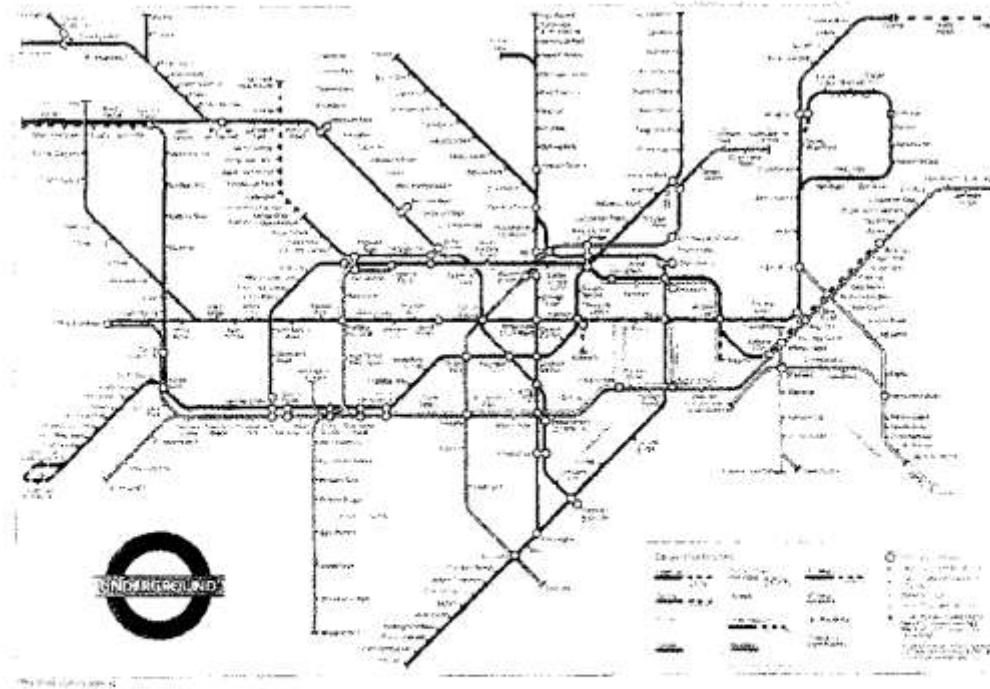
# Information architecture: Example of poor organization



Al Gore from the Democratic Party, lost many thousands of votes, which instead went to the Reform Party.



# Elegance & Simplicity



**20:** The network diagram for the London Underground reflects a problem-oriented refinement of the area's physical geography. By radically compressing the distances between outlying stations, this diagram became the first "fisheye" view. Design by Henry C. Beck, 1935. (See also color plate 2).

# Balance



Balance



Imbalance

Source: <https://www.interaction-design.org/literature/topics/visual-design>