Software product management

Introduction

BITS Pilani

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Contents

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

- About this course

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Software products scenario

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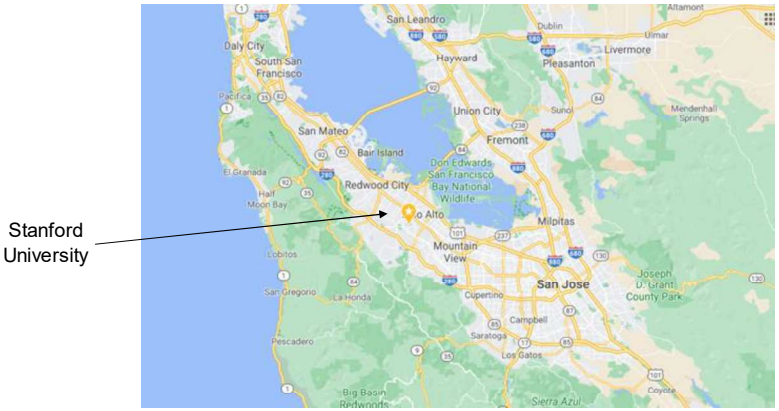
Software product revolution started in Silicon valley



Silicon valley

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

How Silicon Valley became successful?

- 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

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

Unicorns by industry

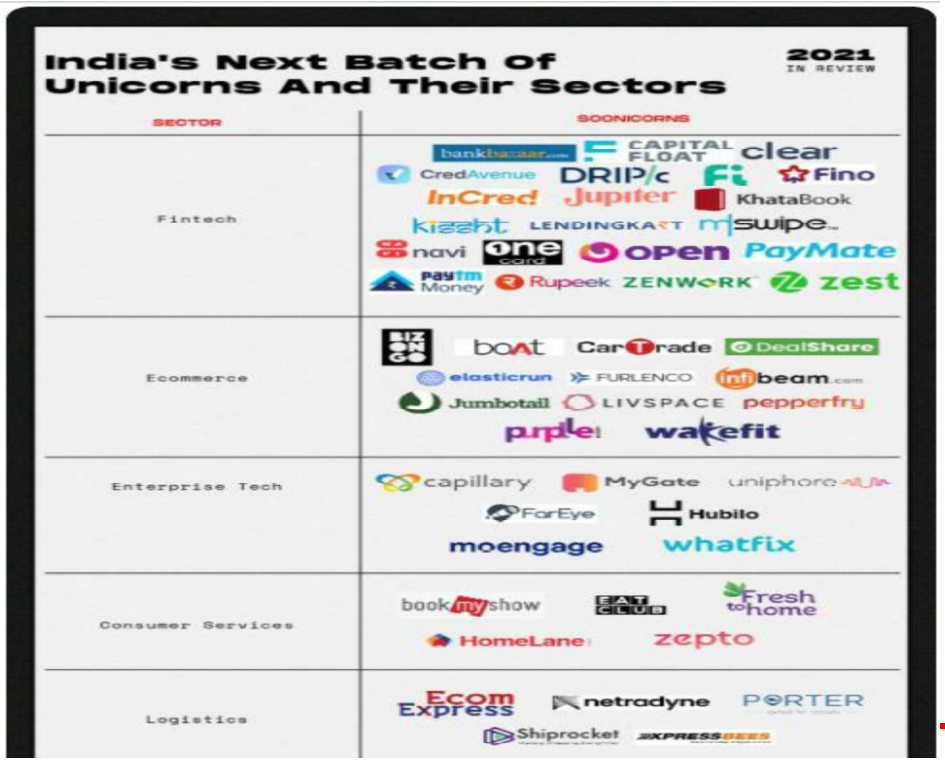
Industry	# of Unicorns
Fintech	80+
Internet software & services	70+
E-commerce & direct-to-consumer	70+
Artificial intelligence	50+
Mobile & telecommunications	35+
Health	35+

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

Growth of start-ups in India

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**

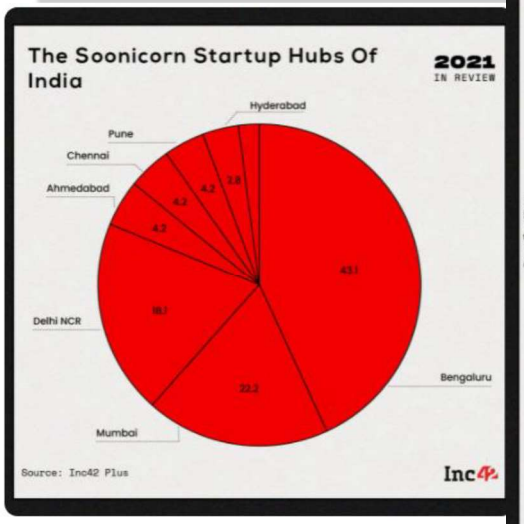
KPMG report: https://home.kpmg/in/en/home/insights/2019/01/startup-landscape-ecosystem-growing-mature.html

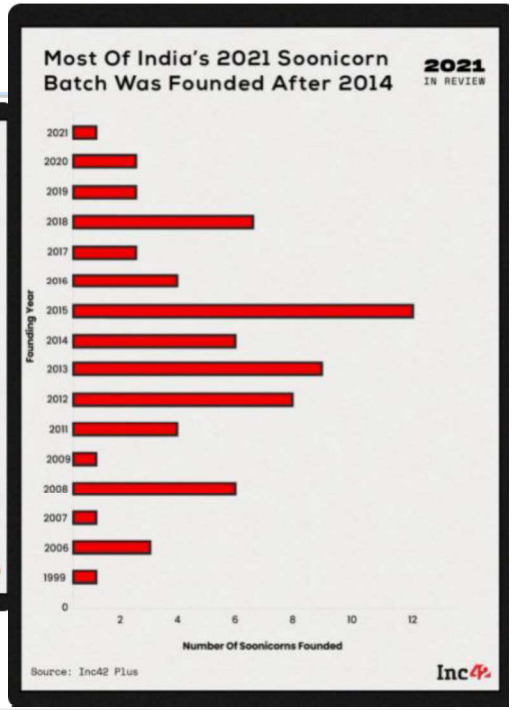


Upcoming unicorns start-ups in India

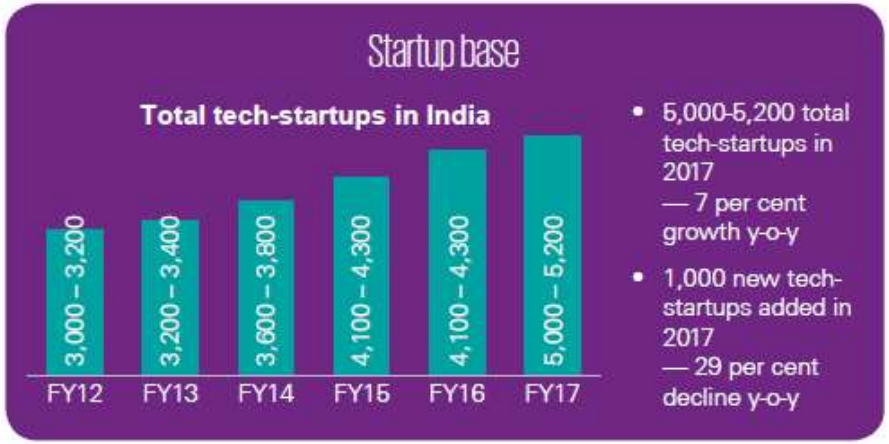
- India has 73 potential unicorns in 2021, up from 52 soonicorns in 2020, with Bengaluru leading the list followed by Mumbai and Delhi-NCR
- The emergence of new models in fintech, consumer services and ecommerce has revitalised funding in these sectors
- As startups raise capital at high valuations, 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/



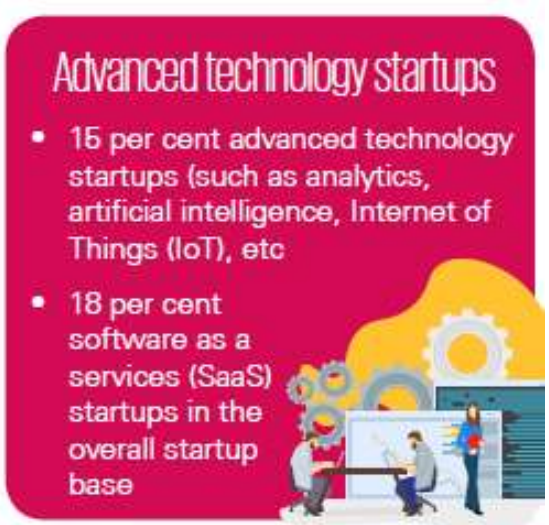


Tech start-ups growth in India



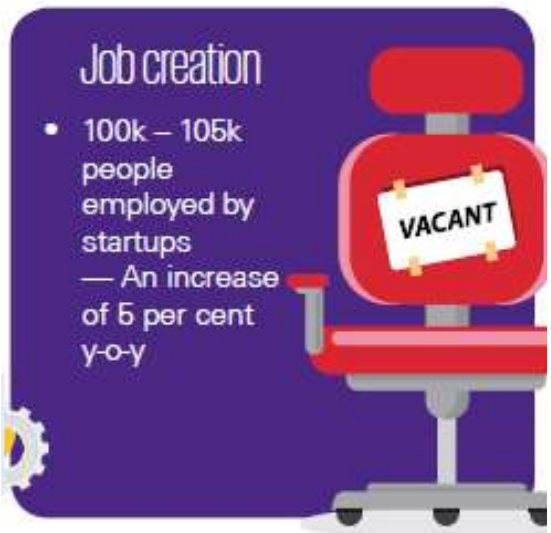
KPMG report: https://home.kpmg/in/en/home/insights/2019/01/startup-landscape-ecosystem-growing-mature.html

Tech start-ups – Advanced technology (India)



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

Tech start-ups – job creation (India)



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

What is spurring product industry?

- 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

- 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 (Roclwell Collin avionics)
- Any other?

Industry segments

- 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

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

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

Product platform

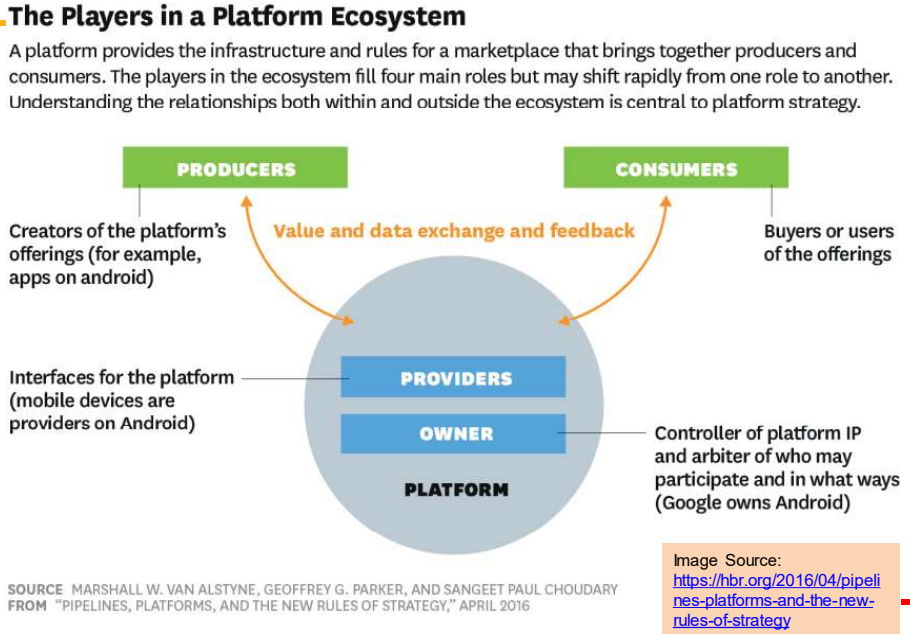


Image Source: https://hbr.org/2016/04/pipelines-platforms-and-the-new-rules-of-strategy

Product family

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

Product line

Product line: Rockwell Collins Avionics systems for different helicopters

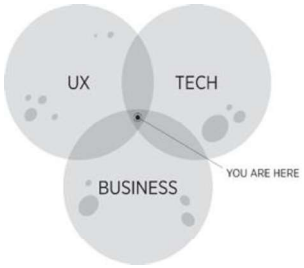
- a collection of similar software systems from a shared set of software assets using a common means of production.

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

- 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

Ref: Product Plan.com

About the course

Hope you have handout.

Sharing thoughts

Name one product company you admire.

What is the reason you admire this company?

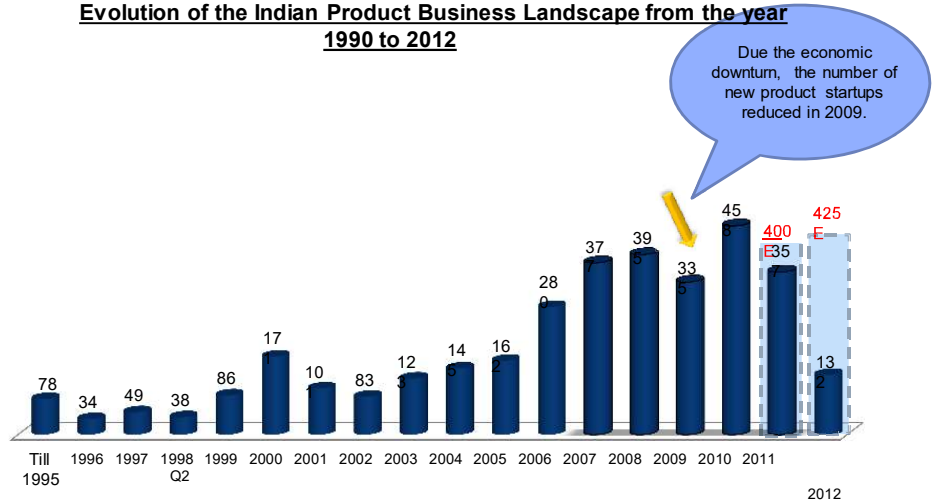
Examples of Products

- 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

Appendix

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

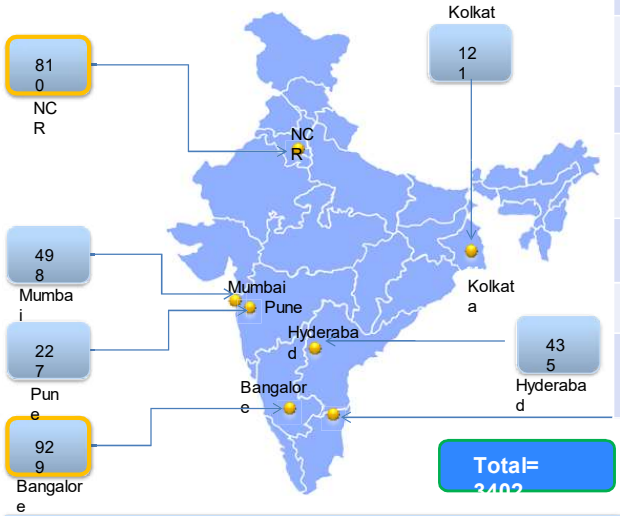


Total= 3402

Note: Only companies with visibility/beta product , live in the market have been considered in the database.; E - Estimated Source: Zinnov Analysis

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

Product companies split across regions

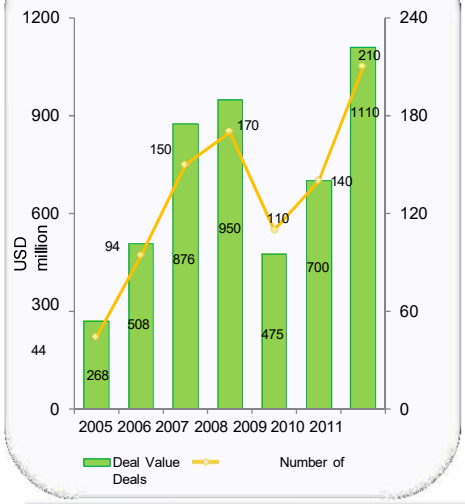


Region	Cities
Bangalore	Bangalore, Mysore, Belgaum, Gulbarga, Hubli
Hyderabad	Hyderabad, Secundrabad,Vishakhapatnu m,Vijayawada
Pune	Pune
Chennai	Chennai, Calicut, **Trivandrum**, Madurai, **Coimbatore, Cochin**, Vellore
Mumbai	Mumbai, Goa, **Ahmedabad**, Vadodara, etc.
NCR	Delhi, Gurgaon, Noida, **Chandigarh**, Mohali
Kolkata	Kolkata, Patna, Bhubaneswar

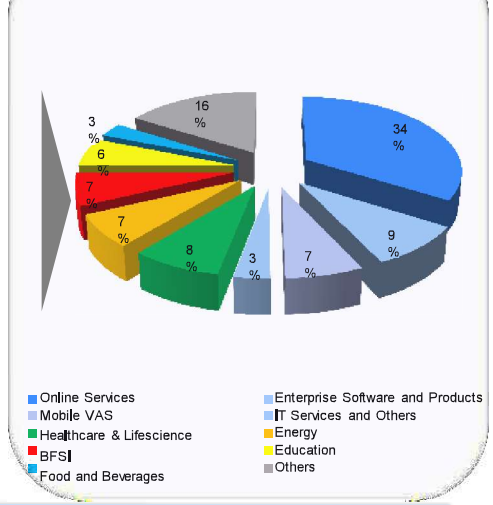
Note: The cities marked in **bold** are emerging Tier-II cities for product startups

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)



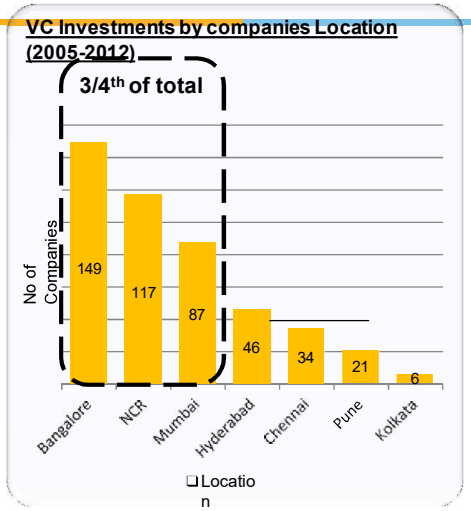
VC Investments by Industry Value – 2012



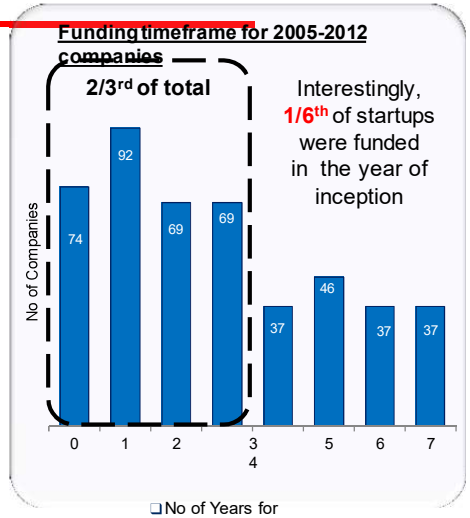
Source: Venture Intelligence; Zinnov Analysis

Overall 58 % of the funded companies from 2005 till today are from Bangalore and NCR

VC Investments by companies Location (2005-2012)



Funding timeframe for 2005-2012 companies

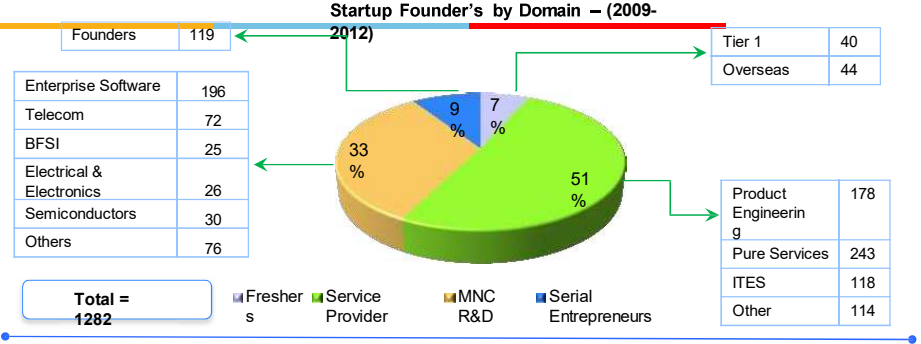


- **Overall funded companies from (2005-2012) are around 446 (i.e. 19 % of 2407 startups)**
- **Around 66% of the companies obtained funding within 3 years of inception**
- **69% of the companies which obtained funding during (2005-2012) are from Digital and Software**

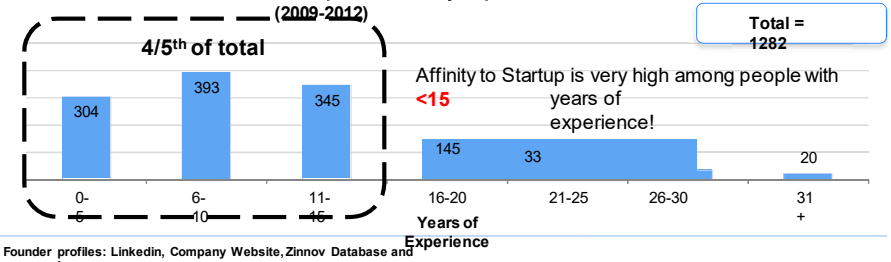
Source of Funding: VCCircle, Crunchbase, Company Website, Zinnov Database and Secondary research.

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)



Source of Founder profiles: Linkedin, Company Website, Zinnov Database and Secondary research.

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

A product organization goes through the following stages:

- Startup
- Growth stage
- Enterprise

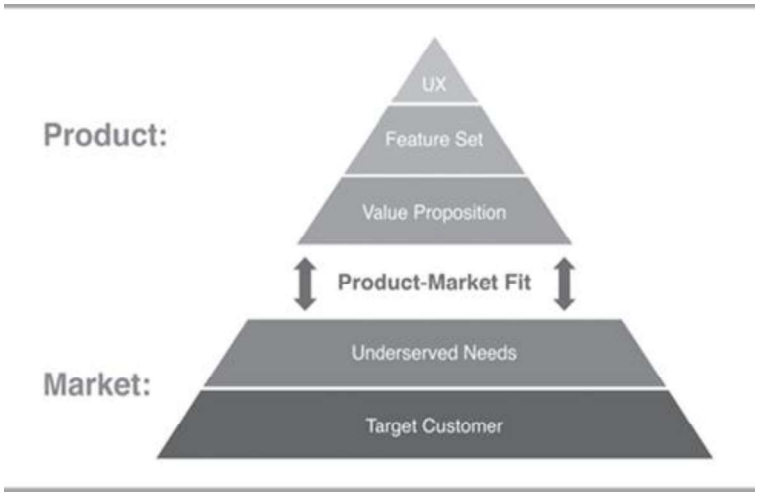
Let us see what are the characteristics of each stage…

Startup stage

- 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

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

- 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

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
• DVD movie sales • DVD rentals • Online booking of DVD, delivered via Post • Streaming video • In house production of serials and movies • Movie / Serial Award function (akin to Oscar)	• Books • Electronics, Others • Recommendation feature • Amazon Prime • Alexa • Kindle • AWS • Firestick • Amazon Pay	• Wall & messaging • News Feed - streams friend's activity • Sell stuff to other Facebookers • Tagging and attachments • 'Like' button • Timeline feature • Buys Instagram, WhatsApp

Why products fail?

- 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

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 techically feasible to build
- Viability - Will be business be viable, can we break even

Tackle risks early - Example

Bounce, AirBnB, Slack

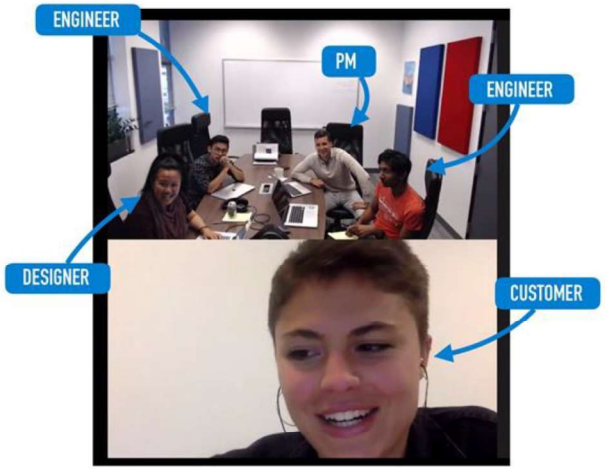
- Bounce spotted an opportunity in Bangalore: Provide scooter to reach the nearest metro station
- Bounce experimented their concept with a few scooters to determine value. Once the demand / value was established, they expanded
- AirBnB rented their house to test value. A conference was being held in 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

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

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

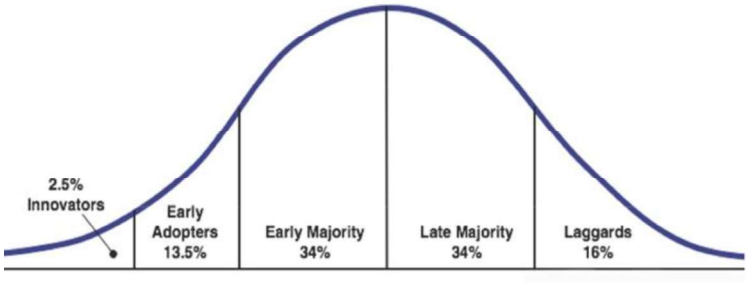
- Development team relies on product management to define a plan and write user stories, requirements, and acceptance
- Marketing team relies on Product management for product information, value proposition definitions. They collaborate to define product position, launch product, define Go-to-market 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…

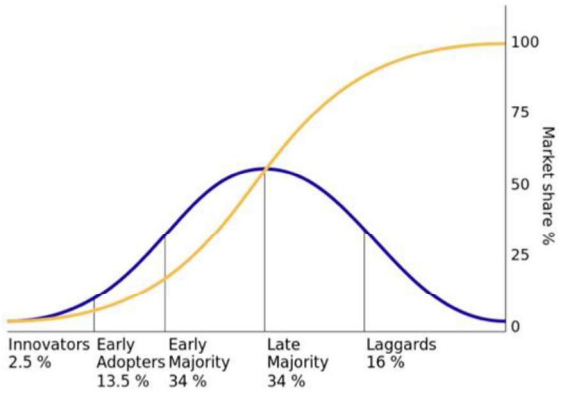
Example:

- 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/

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

- 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 funcding
- Align & focus the organization

Journey of some product companies: Exercise

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/

Appendix

Contents

Principles of product management

- 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.

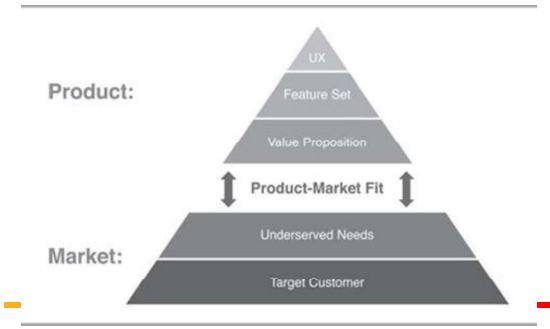
- Have you experienced any of these principles?

Different aspects of a product

- 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

- 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)

- 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

- 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?

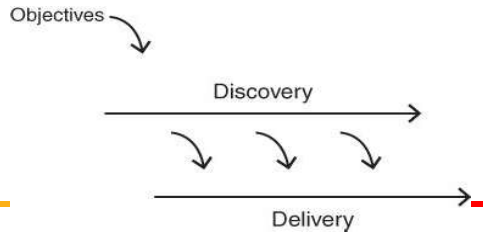
Rivigo story

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: DataXtream 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…

- 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

Software product management

Product process: Identify opportunity

BITS Pilani

Nandagopal Govindan

Contents

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

Customer interviews
Root cause analysis

Agile
Continuous integration

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

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

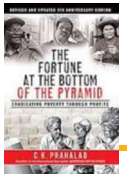
- Oyo: Economy hotels were not clean, lacked basic amenities, etc.
- Sketch: Observed that Photoshop was not easy to use
- Slack: Collaboration between teams was clumsy
- Spotify: People wanted to listen to music legally when illegal music sharing sites were banned

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)

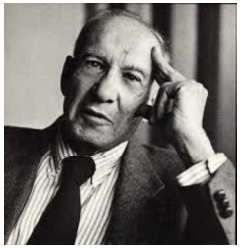
- Grameen Bank: Mohammad Yunus helped poor to stand on their own legs through micro-businesses
- Aravind Eye Hospitals: Free eye surgery for poor, funded by rich patients, developing low cost intraocular lenses
- Narayana Hrudalaya: Dr Devi Shetty offeres low-priced heart surgeries by employing efficient 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

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

Qalara

Sources of Innovation: Peter Drucker



Father of management
&
A Social scientist

Discipline of
ovation - Druc

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

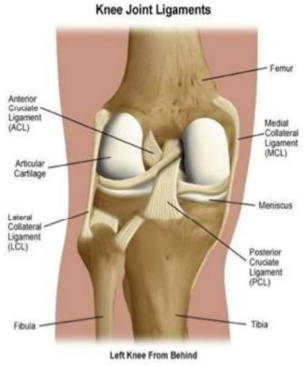
- Unexpected occurrence
- Incongruities (incompatibilities)
- Process needs
- Industry & market changes
- Demographic changes
- Change in perception
- New knowledge

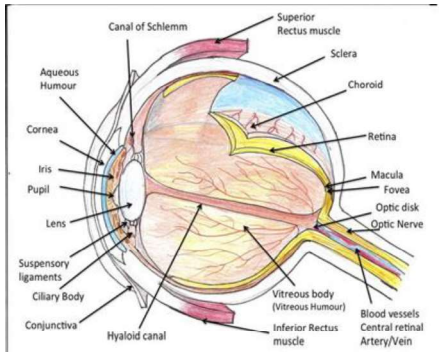
Sources of innovation: Peter Drucker

- 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

- 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)

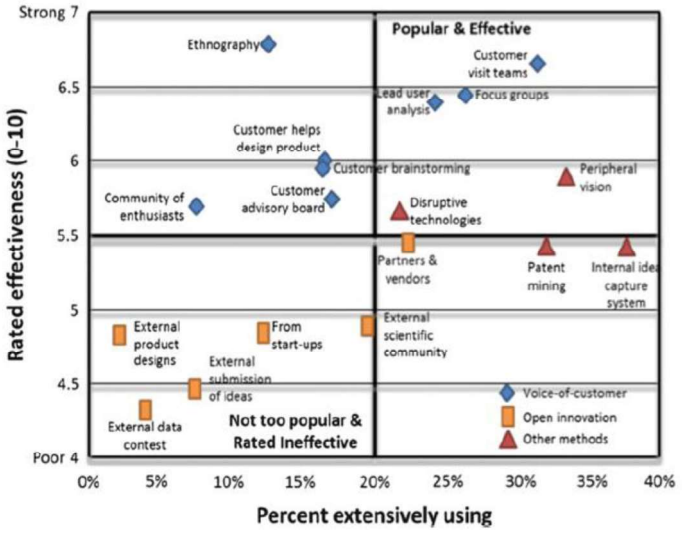


Fig. 5.5 The effectiveness vs. popularity of ideation techniques [CooEdg09]. Used with permission

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?

)BS 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

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

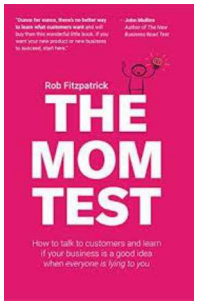
Product	Pain point	How does it solve	Benefit / Value prop.	Differentiation from competition
Rivigo				
OYO				
Postman				

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: 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 were 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 your 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

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 Moble 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 have afford to have a login feature, where the user logins 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

Experience sharing…

- 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

How did you address the risks in your product solution?

Appendix

Contents

Introduction

- 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 Ostervald

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?
	Key resources		**Channels**	
	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?	

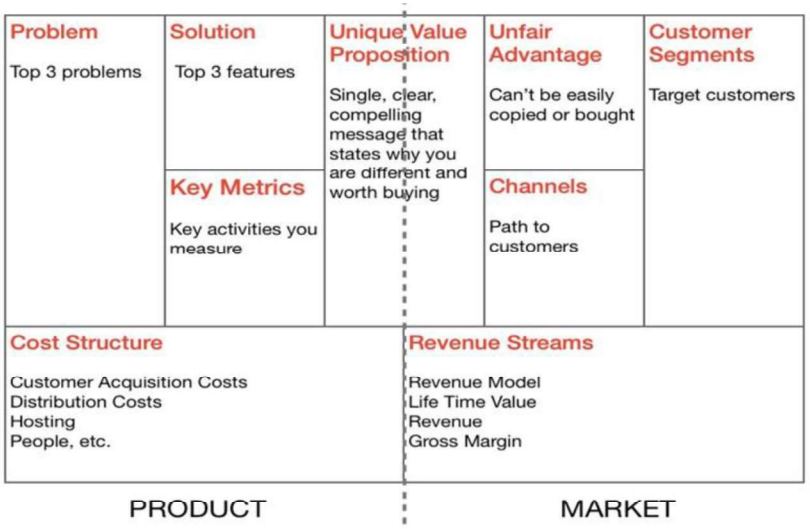
Cost structure	Revenue streams
What are the most important costs inherent to our business model? Which key resources are most expensive? Which key activities are most expensive?	For what value are our customers really willing to pay? For what do they currently pay? What is the revenue model? What are the pricing tactics?

Ref: www.businessmodelgeneration.com/canvas

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

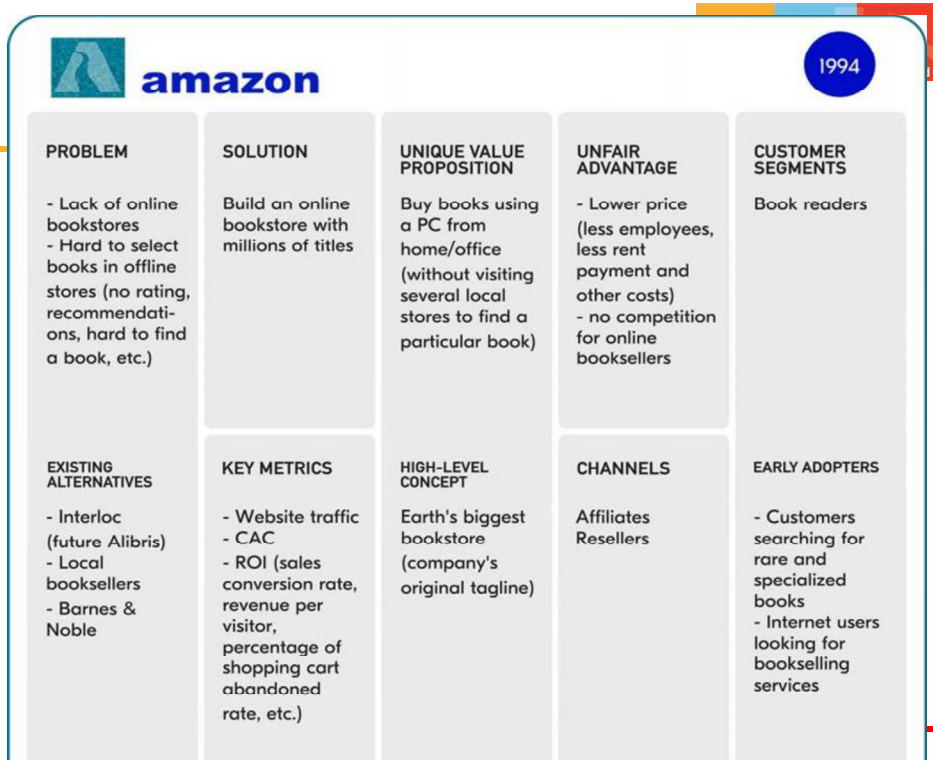
Lean canvas



Ref medium.com

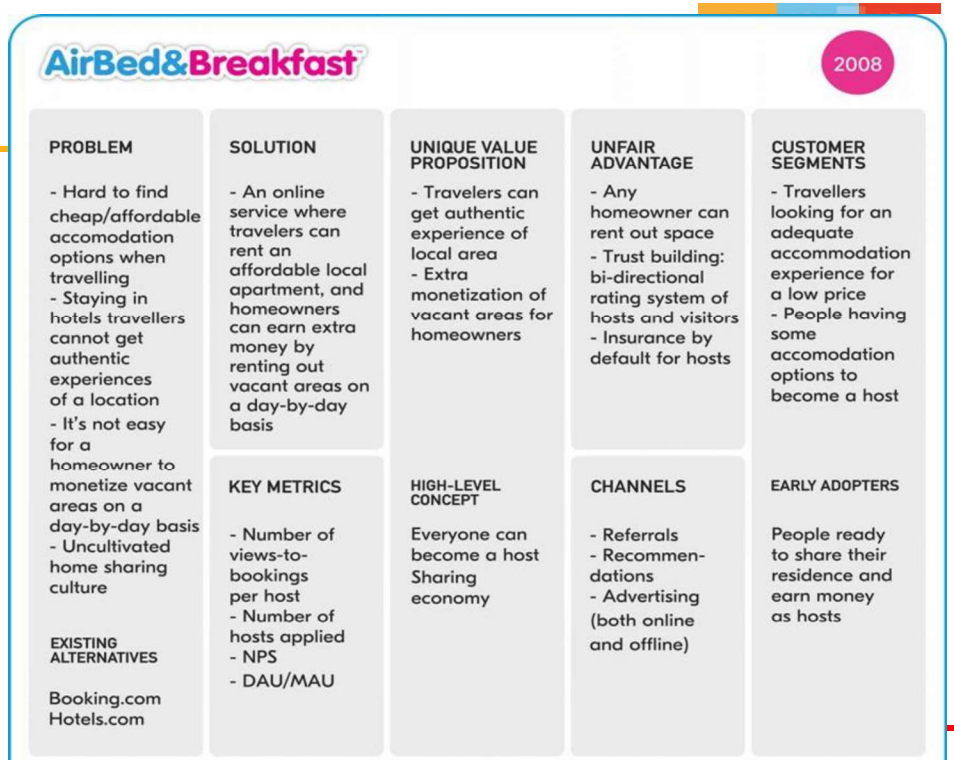
Some explanations

- 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

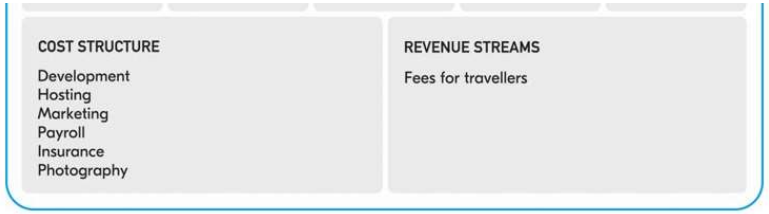


Amazon Lean Canvas…

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



AirBnB Lean Canvas…



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

Exercise

Create a Lean Canvas for

1. Rivigo
2. Qalara

Solution

Appendix

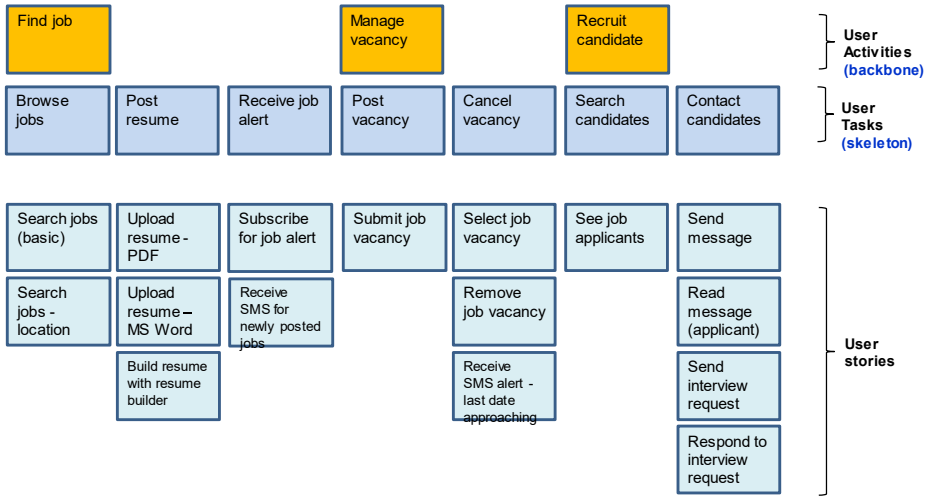
Contents

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

Introduction

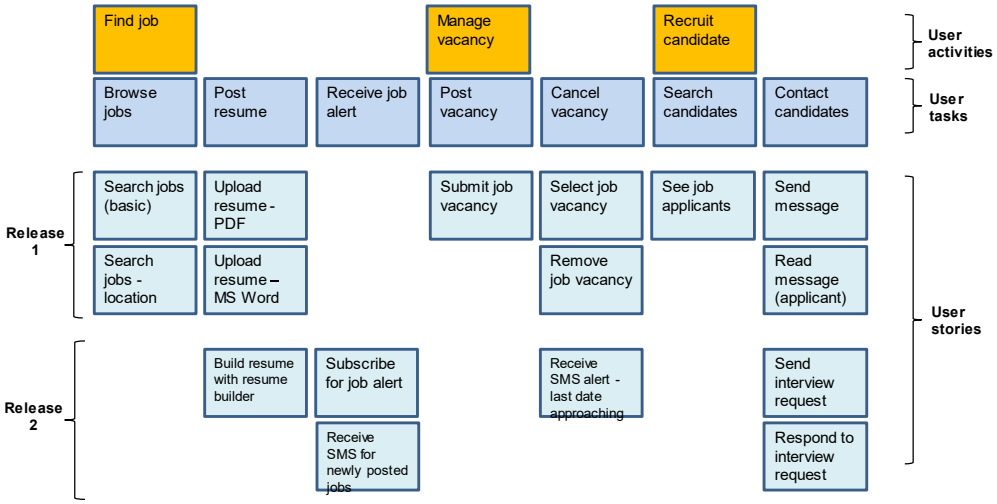
- Once we have understood the need and we have assessed the need by interacting with customers & users, we need to capture all the requirements / features / functionality
- Story map is an effective tool to capture the features
- Invented by Jeff Patton

Story map: Job portal



https://www.visual-paradigm.com/guide/agile-software-development/what-is-user-story-mapping/

Story map: Job portal



https://www.visual-paradigm.com/guide/agile-software-development/what-is-user-story-mapping/

About Story map

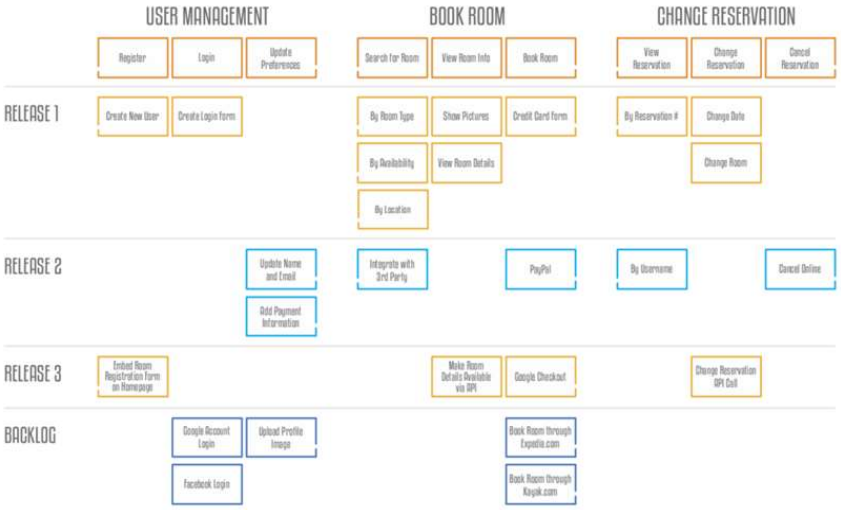
- Story map
  - Uses top down
  - Helps organize features based on importance
  - Helps plan releases

Exercise

Create story map for:

- Hotel booking software

Solution



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
• 2 Ghz CPU • 4 MB RAM • 1 TB Disk	• OS pre-loaded • Anti-virus • Finger print scanner • Touch screen • Dolby sound • Log battery life • Light weight	• Green PC (low power consumption) • Spill proof (water proof) key board • 4G card for internet

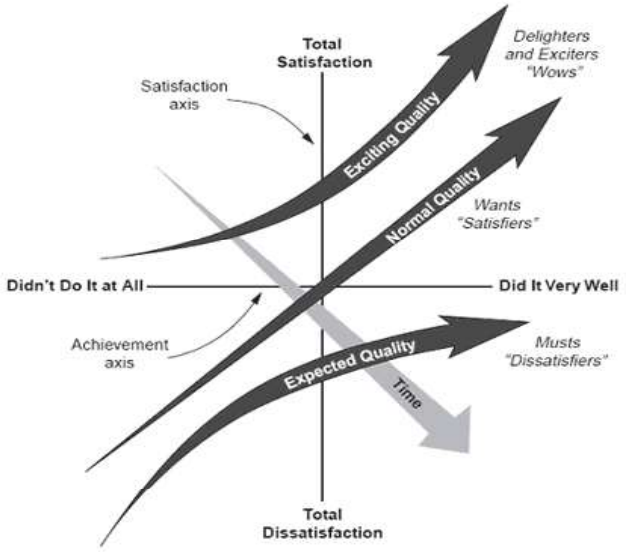
Classification of features: Job portal software

Must have	Wants	Delighters
• Post vacancy • Apply • View applicants	• Get job alert • Hot job indicator	• Resume builder • Good Interview videos • Tips to negotiate salary • Psychometric test

Classification of features: Job portal software

Must have	Wants	Delighters
• Post vacancy • Apply • View applicants	• Get job alert • Hot job indicator	• Resume builder • Good Interview videos • Tips to negotiate salary • Psychometric test

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
• Post vacancy • Apply • View applicants	• Get job alert • Hot job indicator	• Resume builder • Good Interview videos • Tips to negotiate salary • Psychometric test

Exercise

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

- Online banking
- Airline reservation
- eCommerce

Appendix

Story map: Email system

https://medium.com/@mal.sanders/top-5-takeaways-from-user-story-mapping-by-jeff-patton-f8c80cf73750

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

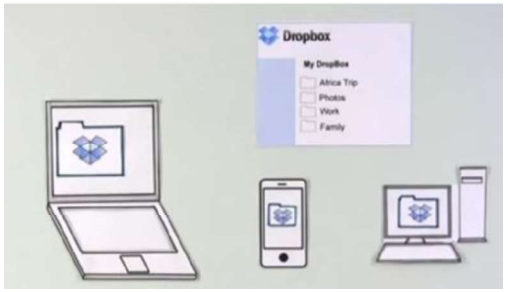
- Facebook used a simple platform that connected students from the same classes by allowing them to post messages to shared boards.
- By introducing Facebook to a super-narrow segment of the market, Zuckerberg managed to validate his idea

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.

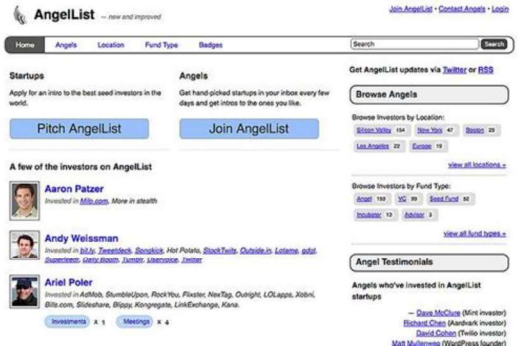
Dropbox MVP

- Dropbox used a video to test hypothesis
- https://www.youtube.com/watch?v=xy9nSnaIvPc&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.

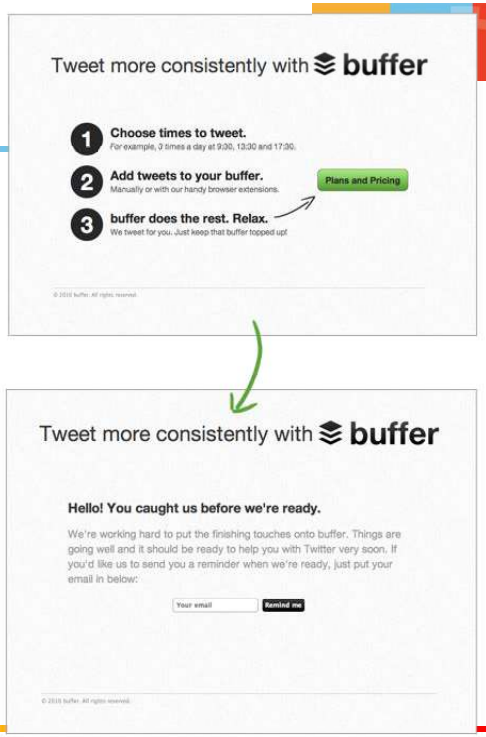


'Buffer' MVP

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



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.

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
Concierage	: 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 hot high and when experiencing the product is important to get a feel
Concierage - 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 (Concierage)	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

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.

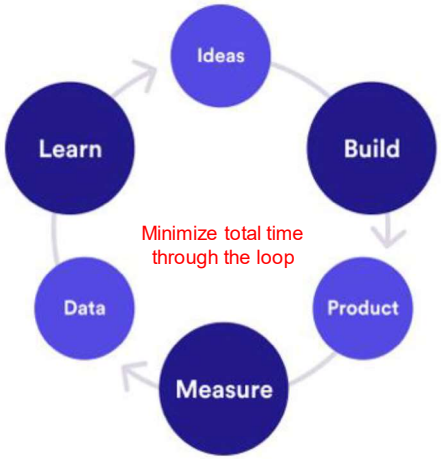
- Real growth should be measured by the growth in value to customers

  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



Agile
Continuous integration

- # 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

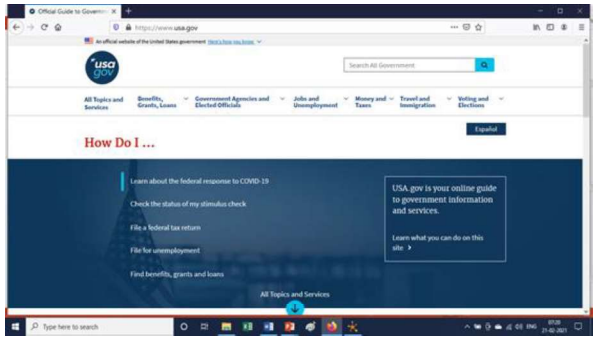
Metrics should be actionable, accessible, auditable

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 LoI (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

1st MVP took 8 months
2nd 4
3rd 3
4th 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

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

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

Contents

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

Introduction

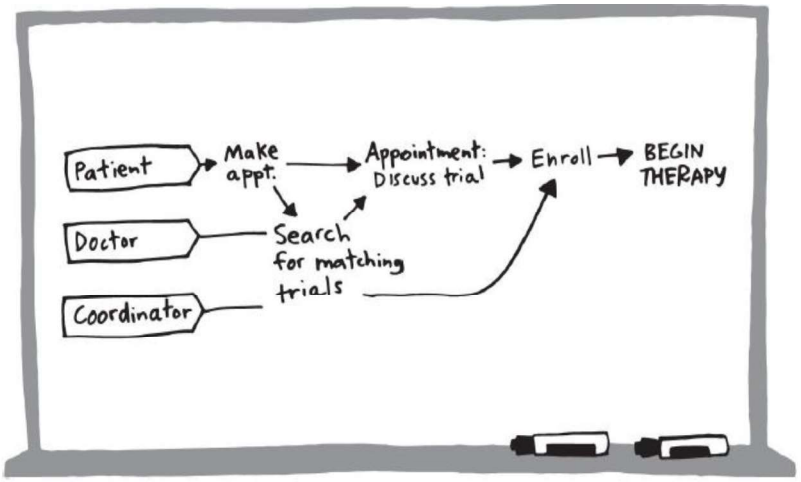
- Quick solutioning & testing its effectiveness is important
- Sprint is technique developed by Jake Knapp who used this technique in Google
- He found 'Sprint' more effective than brainstorming to find solutions to problems, irrespective of the product – software, robot, healthcare
- In brainstorming, 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



Flatiron Health's clinical trial enrollment map.

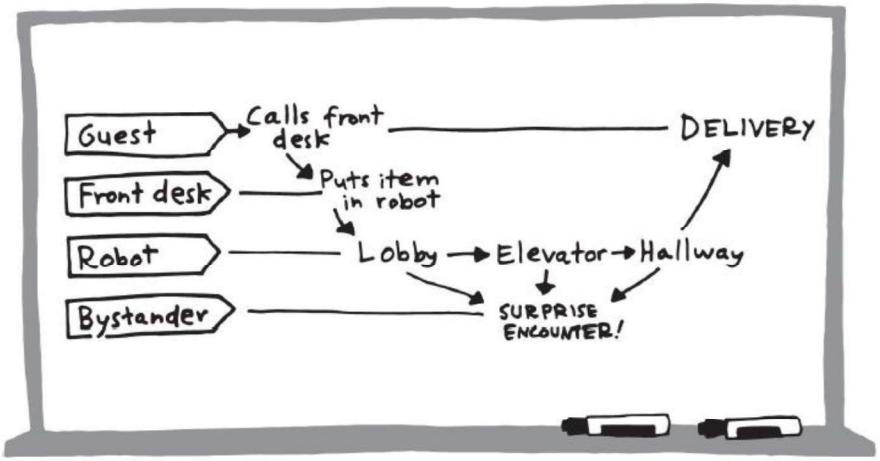
Process for enrolling patients for drug trials

Flatiron

- Flatiron is a heath 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 trails 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.

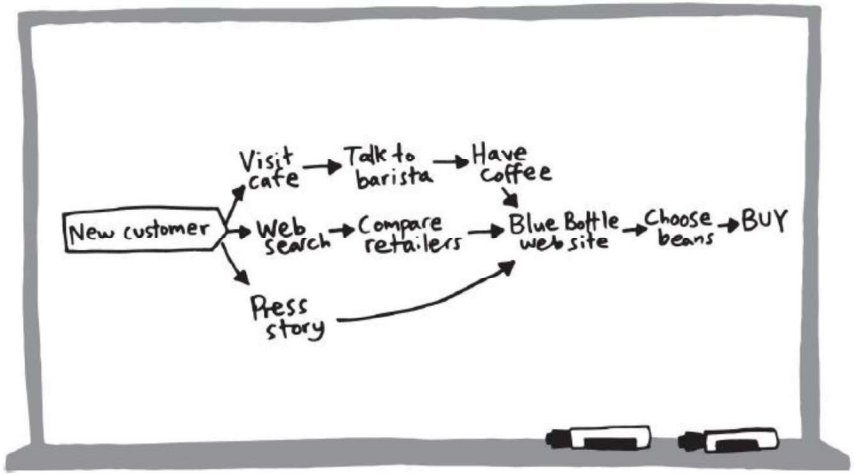
Map for Robot server in hotel

Picture of robot



Savioke's robot delivery map.

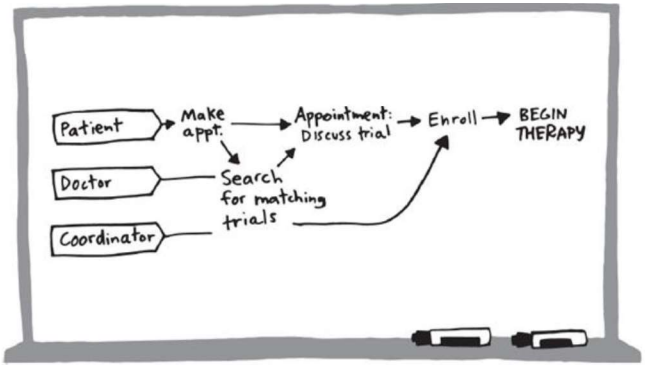
Map: Online coffee sales



Blue Bottle Coffee's online sales map.

Map: Identify the key challenges to be addressed

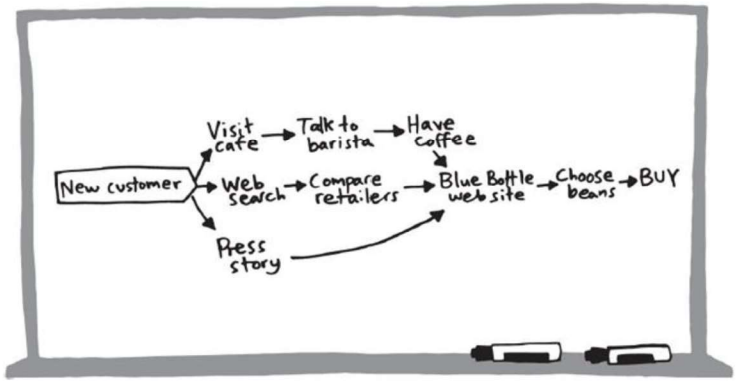
HMW: How may we?



Flatiron Health's clinical trial enrollment map.

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?

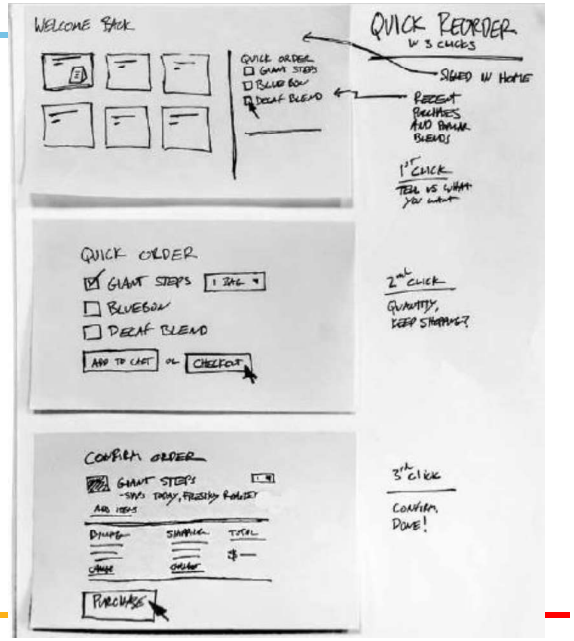
Sketch the solution

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

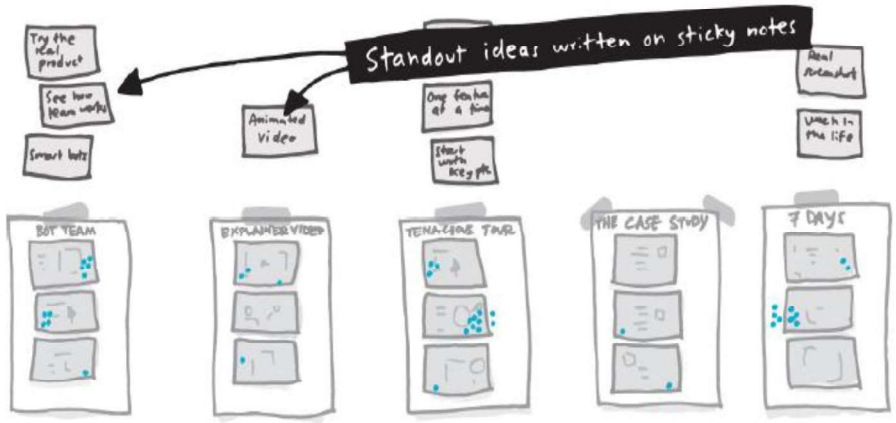
Step 1

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 toimprove

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

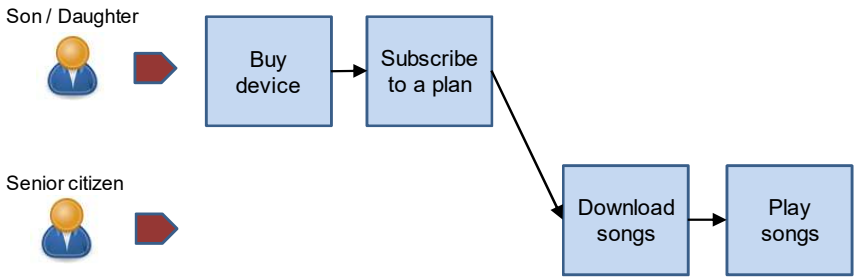
Product: Digital music player device for senior citizens

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/1PX7yRRSwWluzKA5pFy7kc3P861kdWhOQl8DBW8Nu0ew/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

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

Appendix

Contents

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

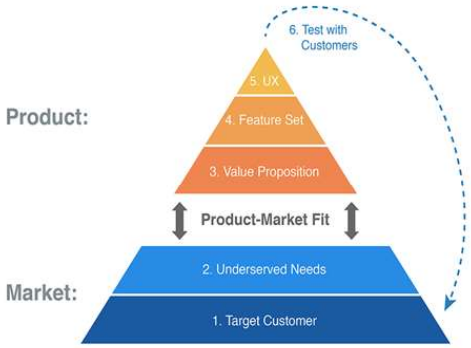
Introduction

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:

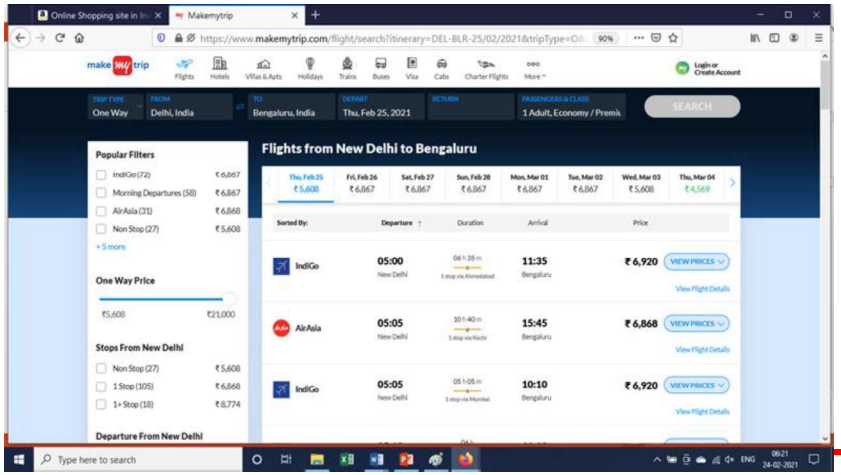
- Learnability: How quickly can you learn to use these - washing machine, Gmail, online banking
- Efficiency: How efficiently can you accomplish your task using these – MS Word, 50 process templates to choose from in Kissflow
- Memorability: How long does it take to use these when you return again to 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

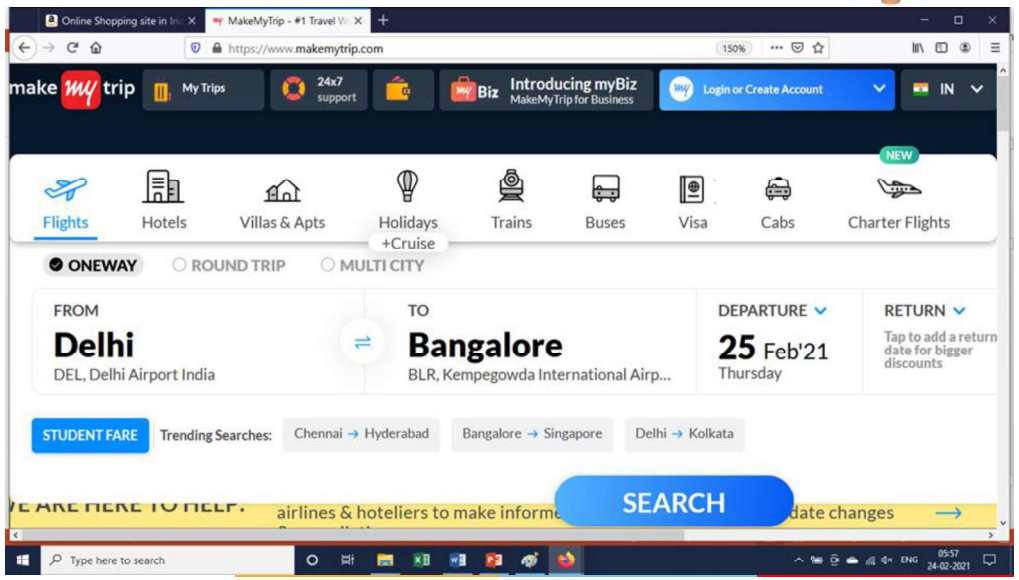
Comment on the "Efficiency" dimension of booking an flight ticket in MakeMyTrip.com



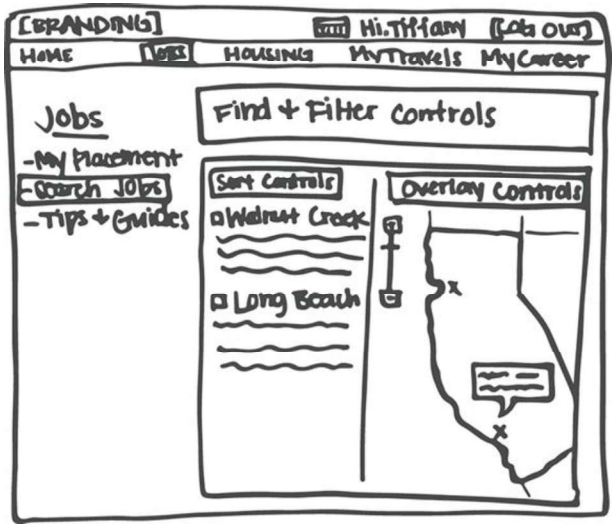
Basic steps

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

Example: Overall structure



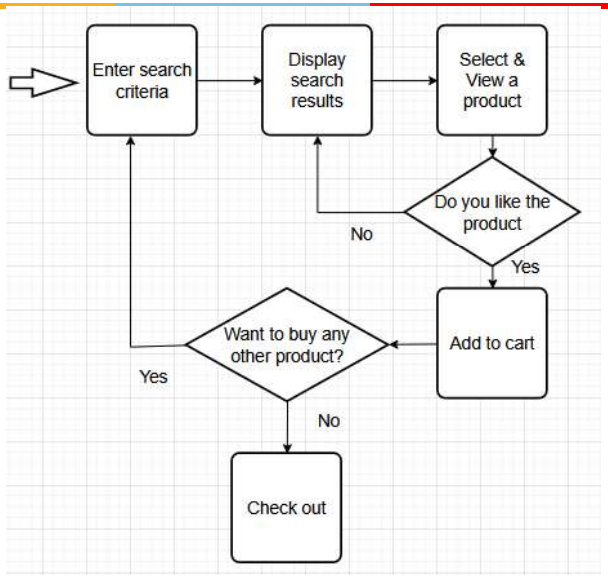
Example: Sketch of overall structure



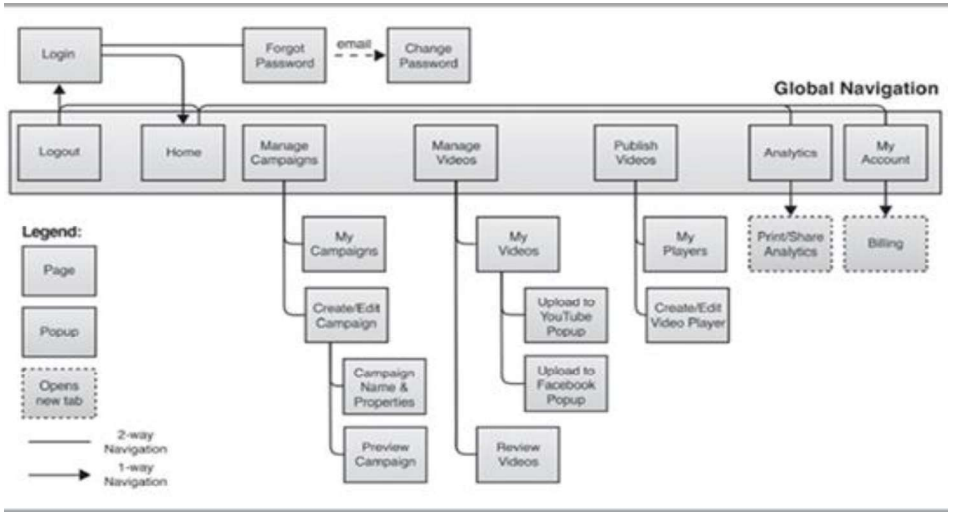
Portal for travelling nurses

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

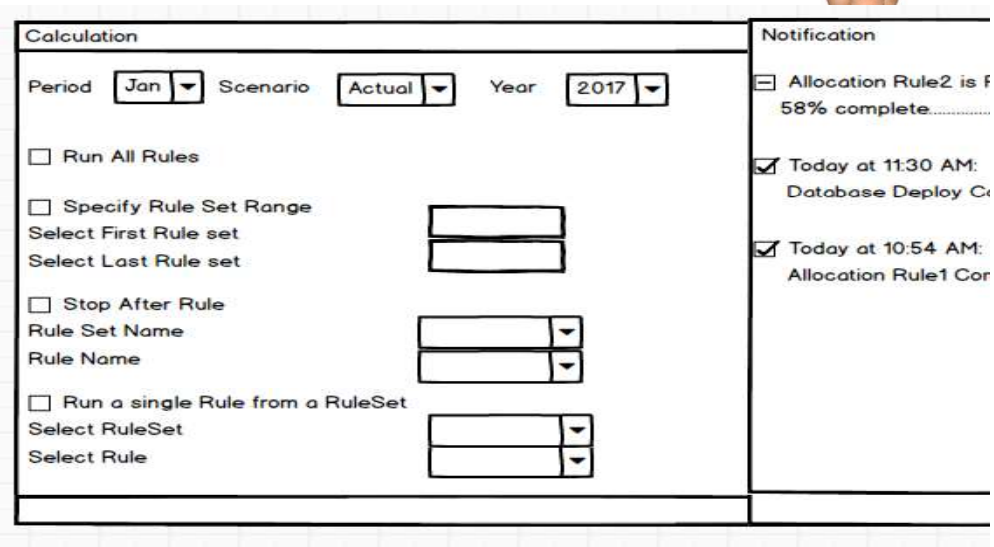
Example: Scenario: Searching & selecting products to buy



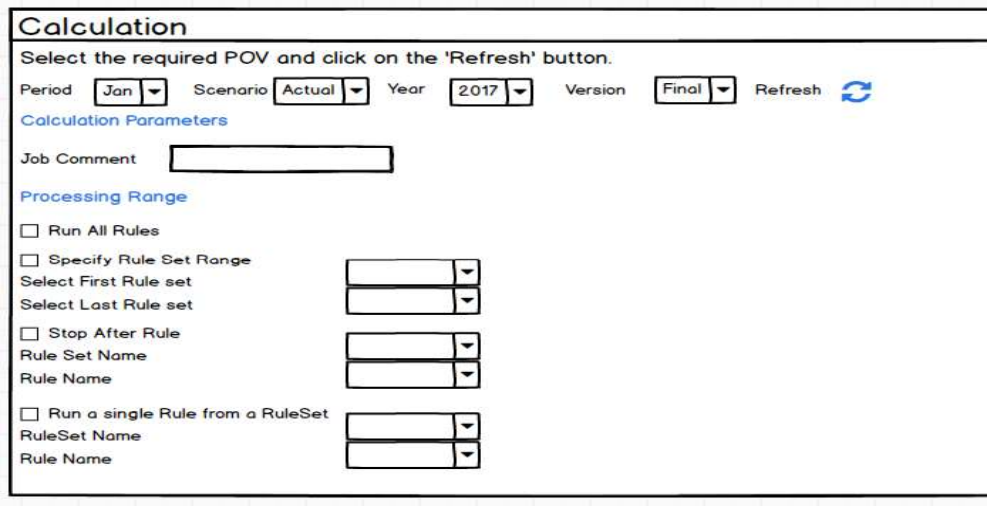
Example: Navigation



Example: Screen design



Example: Screen design

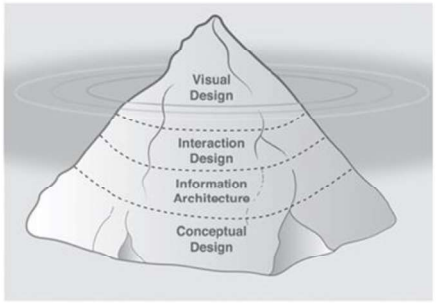


Ideal sequence for design

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

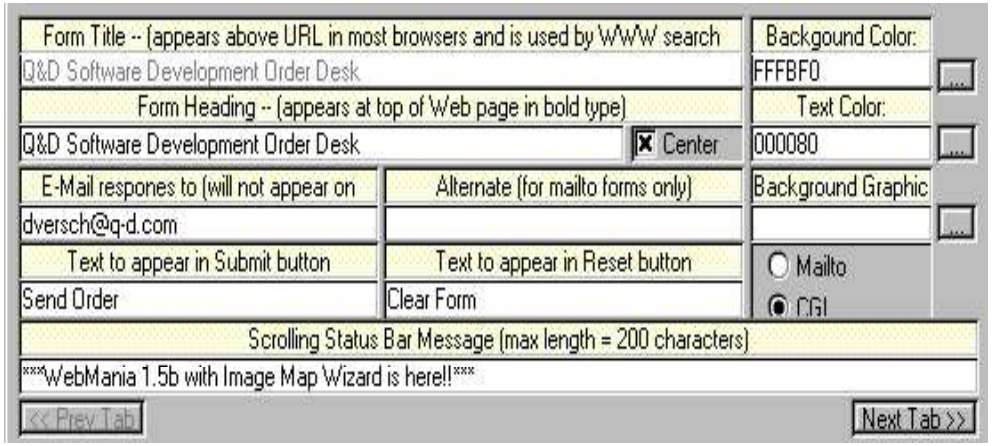
- Comment on the conceptual design of the "Funds transfer" feature of your bank's online banking software

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?



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

Revised & Excellent: https://www.nngroup.com/articles/ten-usability-heuristics/

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

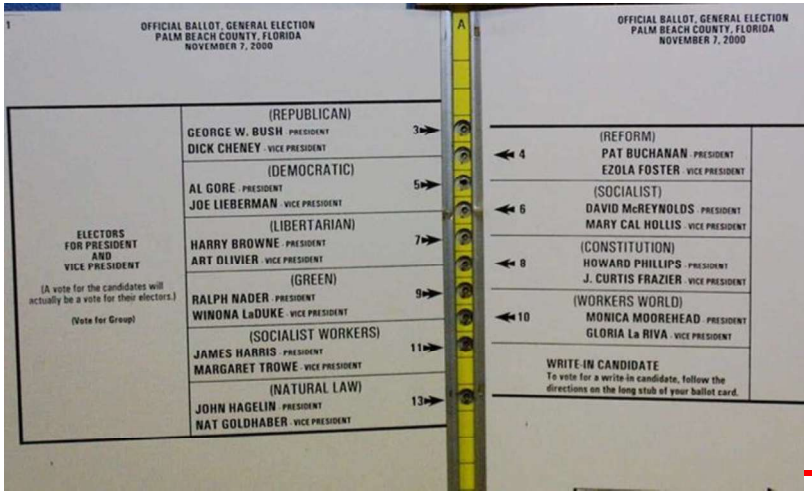
Question

What are the key learnings from this session?

Appendix

Information architecture: Example of poor organization

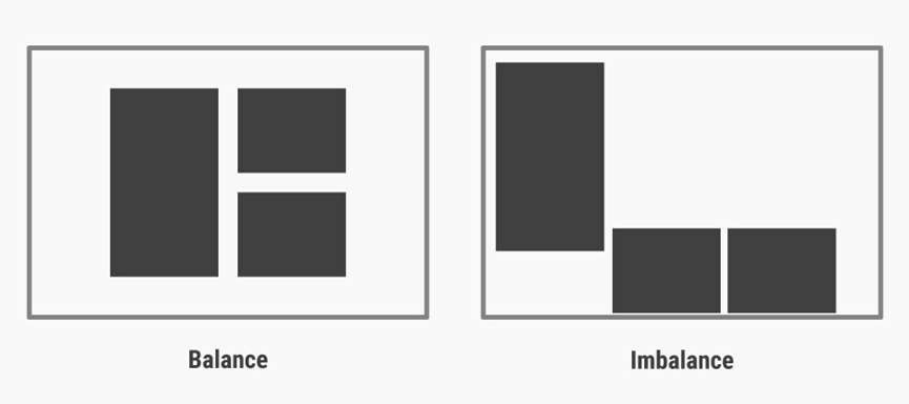
Al Gore from the Democratic Party, lost many thousands of votes, which instead went to the Reform Party.



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



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

Contents

- Introduction
- Steps in Design thinking
- Examples
- Case study

Introduction

- Design thinking is a human-centered approach to innovation—anchored in understanding customer's needs
- Design thinking believes that Innovation is powered by a thorough understanding, through direct observation, of what people want and need in their lives

5 steps of Design Thinking

- **Empathize:** Understanding the user and the problems they face through conducting user interviews, creating empathy maps, and listening to user stories.
- **Define:** Organizing and analyzing the research information to produce a concise problem statement and possible solution or hypothesis.
- **Ideate:** The brainstorming phase. Designers think of a wide variety of possible solutions and evaluate each one.
- **Prototype:** Turning ideas into a physical representation of the product that will solve the user's needs, slowly adding greater detail and complexity as designers move between testing and iteration.
- **Test:** Putting the prototype in the hands of the user and determining whether the product has solved the problem at hand and reduced friction or frustration.

Example of design thinking at Kaiser hospital

Problem statement

- At Kaiser hospitals, nurses routinely spent the first 45 minutes of each shift at the nurses' station, debriefing the departing shift about the status of patients
- Nurses often failed to learn some of the things that mattered most to patients, such as how they had fared during the previous shift, which family members were with them, and whether or not certain tests or therapies had been administered.
- For many patients, each shift change felt like a hole in their care.

Example of design thinking at Kaiser hospital

Solution

- The design that emerged for shift changes had nurses passing on information in front of the patient rather than at the nurses' station.
- In only a week the team built a working prototype that included new procedures and some simple software with which nurses could call up previous shift-change notes and add new ones.
- They could input patient information throughout a shift rather than scrambling at the end to pass it on.
- The software collated the data in a simple format customized for each nurse at the start of a shift.
- The result was both higher-quality knowledge transfer and reduced prep time, permitting much earlier and better-informed contact with patients.

Example of design thinking at Kaiser hospital

Method

- The core project team included a strategist (formerly a nurse), an organizational-development specialist, a technology expert, a process designer, a union representative, and designers from IDEO.
- This group worked with innovation teams of frontline practitioners in each of the four hospitals
- Close observation, combined with brainstorming and rapid prototyping, produced new procedures and software that radically streamlined information exchange between shifts.

Case study: ANA Tomo

A travel companion for the elderly to navigate through the airport

Case study: ANA Tomo

Challenge

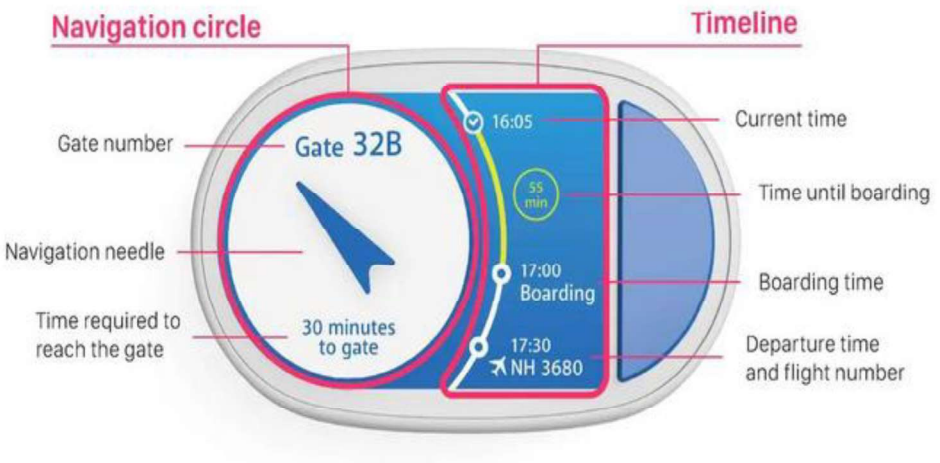
- ANA is Japan's biggest airline.
- Has a large pool of businessmen customers
- ANA seeks to adjust to Japan's upcoming demographic circumstances: the aging society.
- ANA wants to cherish the retired businessmen who accompanied ANA throughout their careers

Case study: ANA Tomo

Solution

- ANA Tomo, best travel companion.
- ANA Tomo is a portable connected object designed with the active retiree in mind.
- It serves ANA elder passengers with live navigation to their boarding gate at the airport.
- ANA Tomo also gives passengers relevant, informative cues, ensuring ANA is by its customers' side throughout their journey.

Case study: ANA Tomo



Case study: ANA Tomo

Impact

- Easily understood by all passengers, ANA Tomo allows them to enjoy their time at the airport while approaching their gate at their own pace, stress free
- ANA can find passengers in case they are lost, speeding up the boarding process.
- Currently the device is being designed for the duration of one's stay in the airport, but future expansions can include the duration of the flight and even the duration of one's travel. ANA Tomo can easily become the future air ticket.

Ref: https://sugar-network.org/
https://www.me310kyoto.org/anatomo

Case study: UberEats

UberEats:

What are the key learnings from the UberEats example?

Key takeaways from the 5 examples:

- Whether it's a new app, a community service, or a physical product, the best thing you can do to innovate successfully is keep your user in mind at every step in the design process. It can be tempting to create a flashy, high-tech product.
- Instead, focus on what your users are asking for.
- It's easy for designers to become disconnected from their user. Don't be afraid to take risks and immerse yourself in the lives of the people who will actually interact with your product. Then implement their feedback and test your results. Eventually you'll land on that final iteration with the potential to change the world around you.

https://careerfoundry.com/en/blog/ux-design/design-thinking-examples/

Homework case studies

What are the ley learnings from these case studies in the area of understanding customer needs, ideation, prototyping, iteration?

Case studies from IDEO company

Appendix

Agenda

- Agile framework
- Sprint phases
- Agile team structure
- Product Release plan
- Estimation
- Sprint planning
- Progress tracking
- Challenges in Agile
- Case study

- Ref: “Agile for Dummies” by Mark Clayton

Introduction

- Traditional software development methods such as Waterfall model have a major drawback – late detection of defects

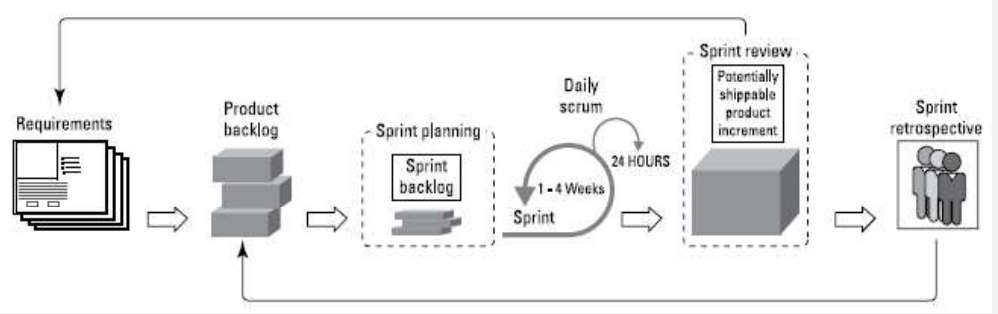
- Agile breaks the development into short-duration iterations, enabling early detection of errors

- Benefits
  - Improved quality due to quicker feedback
  - Focus on business value by implementing features of greater value first
  - Transparency of progress

Agile manifesto (Agile values)

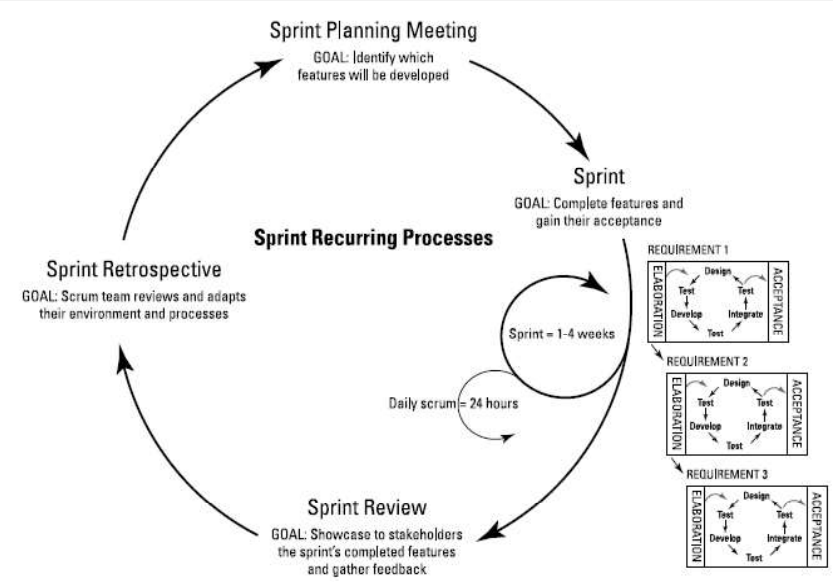
- Individuals & interactions over process & tools
- Working software over comprehensive documentation
- Customer collaboration over contract negotiation
- Responding to change over following a plan

Agile framework

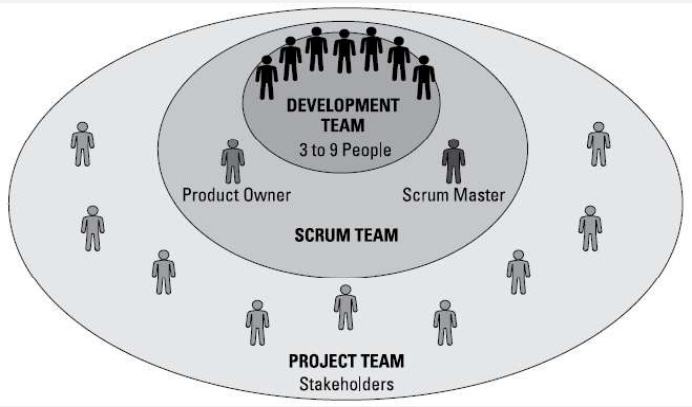


Source: "Agile for Dummies" by Mark Clayton

Sprint phases: Planning, Execution, Review & Retrospective



Agile team



Agile team: Roles and responsibilities

Product owner:

- Expert in customer business need
- Prioritizes requirements
- Does acceptance

Scrum master / Agile coach

- Expert in Agile process
- Communicate with stakeholders
- Clears roadblocks

Development team

- Multi-skilled – set up environment, automate builds, continuous integration, refactoring

Experience sharing…

Did you have any other roles?

Product Roadmap

Steps:

1. Identify stakeholders.
2. Establish product requirements and add them to the roadmap.
3. Prioritize requirements based on values, risks, and dependencies.
4. Estimate the development effort at a high level
5. Determine high-level time frames for releasing groups of functionality to the customer

Requirements, User stories, Release plan

Home loan application

Features –>	Apply	Evaluate	Approve	Pay EMI	Close loan
Release 1	Apply for loan - Single applicant	Check credit history	Verify repayment capacity	Pay EMI - Normal	Close after paying all EMIs
		Determine ability to pay			
		Calculate max loan			
Release 2	Apply for loan - Husband & wife jointly			Pay EMI - after skipping one	
Release 3	Apply for loan - Multiple people				Close by paying remaining amount (Foreclosure)

User stories

Product features, Priority, Estimation, Release plan

ID	Story	Estimation	Priority	
7	As an unauthorized User I want to create a new account	3	1	
1	As an unauthorized User I want to login	1	2	
10	As an authorized User I want to logout	1	3	
9	Create script to purge database	1	4	
2	As an authorized User I want to see the list of items so that I can select one	2	5	*Release*
4	As an authorized User I want to add a new item so that it appears in the list	5	6	
3	As an authorized User I want to delete the selected item	2	7	*Release*
5	As an authorized User I want to edit the selected item	5	8	*Release*
6	As an authorized User I want to set a reminder for a selected item so that I am reminded when item is due	8	9	*Release*
8	As an administrator I want to see the list of accounts on login	2	10	
Total		**30**		

Velocity: 3 Points / Sprint **Sprint length 2 weeks**

Source: https://www.scrum-institute.org/Release_Planning.php

Estimation techniques

- Estimation Poker
- Affinity based estimating

Estimation poker

Poker cards
Numbers represent relative effort of user stories

Steps:

1. Provide a deck of estimation poker cards.
2. The team agrees on one user story that would be a 5.
3. The product owner reads a high-priority user story
4. Each player selects a card representing the effort involved
5. If the players have different story points: discuss assumptions, re-evaluate. If members differ, breakdown the story

Estimation Poker

- A typical deck has cards has Fibonacci sequence 1, 2, 3, 5, 8, 13
- The reason for using the Fibonacci sequence instead of simply doubling each subsequent value is because estimating a task as exactly double the effort as another task is misleadingly precise
- Very high numbers are not used in the deck, since it is difficult to accurately estimate a large effort
- If the effort can not be estimated, the user story is broken down

Example of Poker estimation

ID	Story	Estimation	Priority	
7	As an unauthorized User I want to create a new account	3	1	
1	As an unauthorized User I want to login	1	2	
10	As an authorized User I want to logout	1	3	
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2	As an authorized User I want to see the list of items so that I can select one	2	5	*Release*
4	As an authorized User I want to add a new item so that it appears in the list	5	6	
3	As an authorized User I want to delete the selected item	2	7	*Release*
5	As an authorized User I want to edit the selected item	5	8	*Release*
6	As an authorized User I want to set a reminder for a selected item so that I am reminded when item is due	8	9	*Release*
8	As an administrator I want to see the list of accounts on login	2	10	
Total		**30**		

Velocity: 3 Points / Sprint **Sprint length 2 weeks**

Source: https://www.scrum-institute.org/Release_Planning.php

Exercise

Hotel Room Reservation Mobile app

Business travellers on the move, find it hard to make hotel reservation since they need to open their laptop and make reservations. It would be really convenient if a user friendly mobile app is made available by the hotel.

The UI of this mobile app should be extremely easy to use. It should support functions to Check availability of room, know the price of rooms, make a booking, etc. After their stay, the app should allow the user to provide their feedback.

Exercise

User stories

- Room booking
- Feedback
- Messages from hotel
- Look at booking history
- Check loyalty points
- Cancel booking
- Request for information
- Register
- Login
- Logout

Exercise

Prioritize user stories

- Room booking
- Feedback
- View messages from hotel
- Look at booking history
- Check loyalty points
- Cancel booking
- Request for information
- Register
- Login
- Logout

Exercise

Prioritized user stories

- Register
- Login
- Logout
- Room booking
- Cancel booking
- Look at booking history
- View messages from hotel
- Feedback
- Check loyalty points
- Request for information

Exercise

Create a release plan (Group user stories into releases)

Release 1
- Register
- Login
- Logout
- Room booking
- Cancel booking

Release 2
- Look at booking history
- Messages from hotel

Release 3
- Feedback
- Check loyalty points
- Request for information

Exercise

Estimate the following user stories:

1. Register
2. Login
3. Logout
4. Room booking
5. Cancel booking

Estimation

Feature	User story	Story point (Relative estimate)
Register	Enter user id and password: System registers the user	2
Login	Enter user id and password: System displays main page	2
Logout	System displays Login page	1
Room booking	Specify 'from' date & 'to' date: System displays rooms available and their price	3
	Pick a room category to book: System asks user to enter credit card #	1
	Enter credit card # and CVV: System makes the reservation and returns confirmation #	8
Cancel booking	System displays active bookings	2
	Select one of the bookings: System cancels the booking and credits money to your credit card account	8

Experience sharing…

Did you use this method?

If not, what method did you use?

T-Shirt sizing: Small, Medium, Large, Extra large is another way of categorizing the stories. Each size has an effort associated with it.

Affinity estimation

- Used when user stories are many, say 500+
- When you have a large number of user stories, many of them are probably similar and would require a similar amount of effort
- You quickly categorize your user stories and then apply estimates to these categories of stories

Sprint planning

- Set a goal for the Sprint
- Select User stories to be developed in the Sprint
- Identify the tasks for each user story – design, develop, code analysis, security hole check, test
- Estimate effort for each task
- Assign a person responsible for each task

Sprint planning

Sprint goal: Demonstrate the ability of a mobile banking customer to log in and view account balances and pending and prior transactions.

ID	Task	Story Points	Responsible	M 4 (Start w/ sprint planning)	Tu 5	W 6	
125	**View account balance**	**8**	**Developer name**	**8**	**8**	**8**	
	Write automated unit test and develop API		Suraj	6	6	6	
	Implement UI		Nancy	3	3	3	
	Write automated functional test		Kavita	3	3	3	
	Write automated integration test		Paul	4	4	4	
	Write automated regression test		Liam	2	2	2	
	Conduct peer review			1	1	1	
	Update wiki			1	1	1	
	Promote to QA environment			1	1	1	
0059	**View pending transactions**	**5**	**Developer name**	**5**	**5**	**5**	
	Write automated unit test			5	5	5	
	Implement UI			2	2	2	
	Write automated functional test			4	4	4	
	Write automated integration test			5	5	5	

Sprint 1 plan for Hotel room reservation mobile app

ID	Task	Story point	Reponsible	Effort (Hrs)	Mon	Tue	Wed	Thur	Fri
1	**Register**	2	Akshay	40					
	Design UI			4	4				
	Get UI feedback			2	2				
	Implement front end			8	2	6			
	Design back end			8		2	6		
	Implement back end			8			2	6	
	Peer review			4				2	2
	Make changes			4					4
	Test			2					2
2	**Login**	2	Veena	40					
	Design UI			4	4				
	Get UI feedback			2	2				
	Implement front end			8	2	6			
	Design back end			8		2	6		
	Implement back end			8			2	6	
	Peer review			4				2	2
	Make changes			4					4
	Test			2					2
3	**Log out**	1	Tom	20					
	Design UI			2	2				
	Get UI feedback			1	1				
	Implement front end			4	4				
	Design back end			4		4			
	Implement back end			4		4			
	Peer review			2			2		
	Make changes			2			2		
	Test			1			1		
4	**Training**		Tom						
	Train new employees			20				8	8
	Total for Sprint				23	24	21	24	24

Sprint execution

Daily scrum meeting

- What was completed yesterday
- What challenges were faced
- What is the plan for the day

- Once a week, a big picture view of the product, its goals, etc.

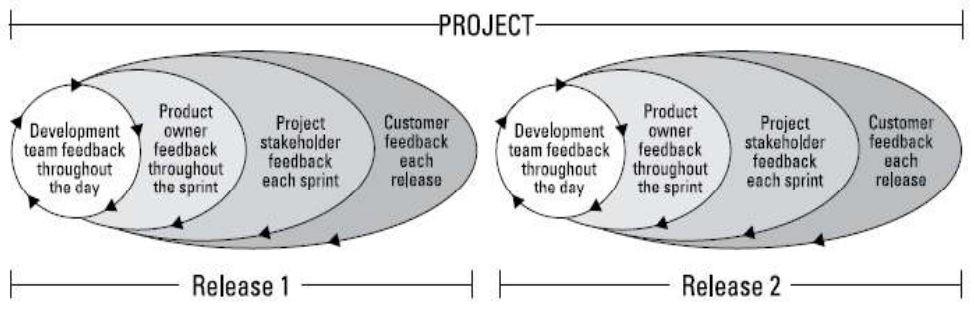
Burndown chart

JIRA provides this insight

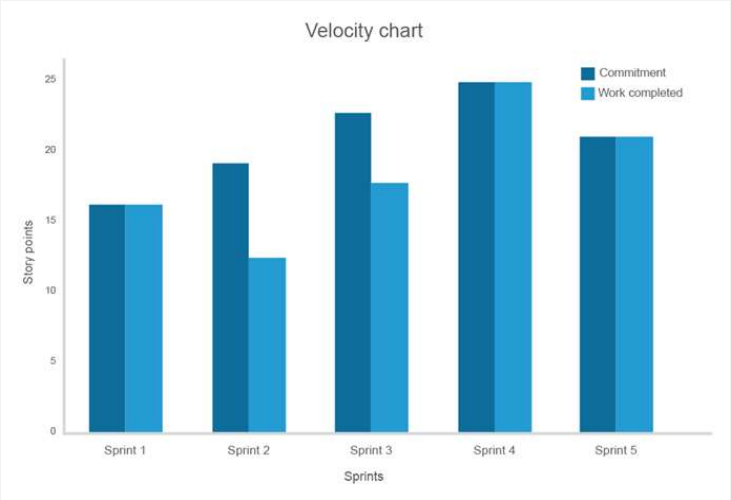
Experience sharing…

How did you track progress in your project?

Feedback cycles



Velocity



# of story points completed per Sprint

Source: https://www.altexsoft.com/blog/business/25-scrum-process-best-practices-that-set-your-agile-workflow-for-efficiency/

Challenges

- Lack of skilled product owners from business side
- It is difficult to quote fixed price and time due to changing requirements, dependency on client in each sprint
- Architectural changes and rework due to new requirements

Case study: Pharma company Inventory management

Table 4 – Project XYZ Product Backlog.

Product Backlog – XYZ Project					
ID	User Case	Relevance	Estim.	How to Demonstrate	Remarks
1	Know the expiration date of the medicine batches in stock	200	5	Create specific screen for in stock materials, by batch expiration date.	Use, if possible, view by the inquire screen of current inventory, through customizing.
2	Correct inconsitencies in the expiration dates of the medicine batches in stock	180	3	Create manual update mechanism, with function segregation, to update inconsistente dates. Additionally, the possibility to black manual batch entry, at the end of the production line.	Review access profiles and add new functionality, only for Quality Manager.
3	Do not allow expiration date changes for medicine transferred among warehouses	160	2	Keep, during material transfer, expiration date of the original batch.	Review stock transfer transactions, and check associated profiles.
4	Validate the expiration date of medicine batches in stock	140	5	Complementary to ID #2. There must be a process of "auditing" of in stock materials, with a record of changes in the validity of the materials dates.	New program to be created, with restricted and controlled access execution.
5	Enable full inquire of	120	5	Develop new query	Verify users who will

Results

5 sprints, 100 days (about 4 months). However, results used after the first month

Table 5 – Project's main results.

Consideration	Explanation	Participant's Quote
Project Team	In the team's point of view, the fact that the results are being frequently delivered was motivating, providing greater satisfaction in seeing what was done and deployed. In addition, another important factor was the constant and real-time communication, which made a pleasant work environment (even in the early stages of the project).	According to the developer, "seeing what was done delivered generates greater satisfaction. In addition, constant communication and in real-time makes the working environment more pleasant."
Results (Deliverables)	With the project, the project team reported that changes in the scope were quickly addressed. For example, in agile management, customer reviews were made at the end of each Sprint, and any customer requirement non-compliance could be immediately addressed, not waiting until the end of the project, as it often hapens in traditional approach.	In the Scrum Master view, "any change in the project scope is quickly addressed, and I consider this as a strength of the agile."
Customer	From the customers' point of view, they already receive something to use at the end of the first month. In addition, the Scrum approach helps to	As a customer mentioned, "within a month, you already have something and can start

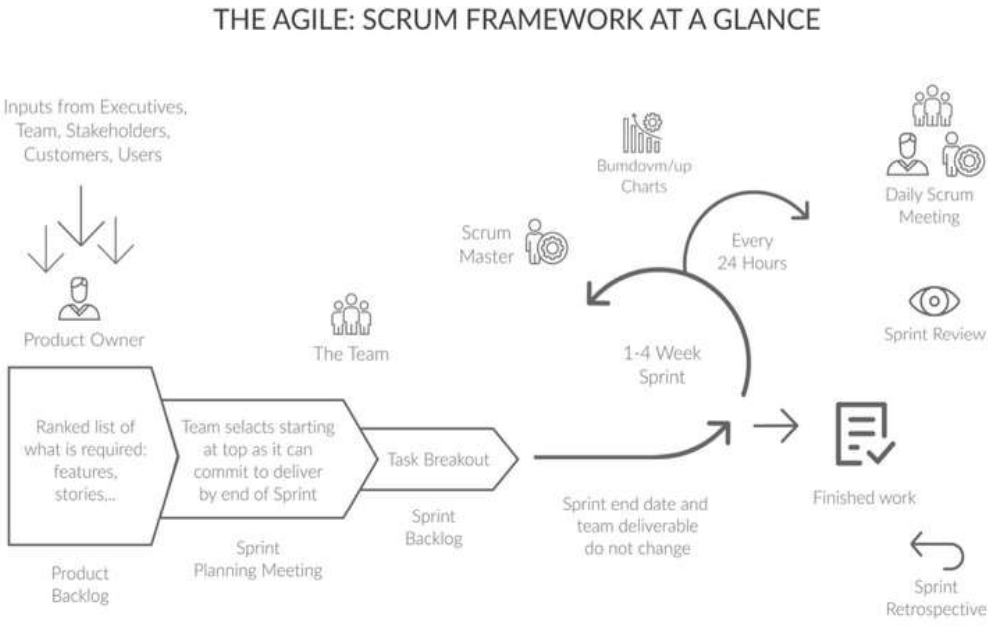
Experience sharing…

What benefit did you get from Agile method?

What challenges did you face?

How did the customer / end user feel?

Appendix



https://www.altexsoft.com/whitepapers/agile-project-management-best-practices-and-methodologies/

Requirements, User stories, Release plan

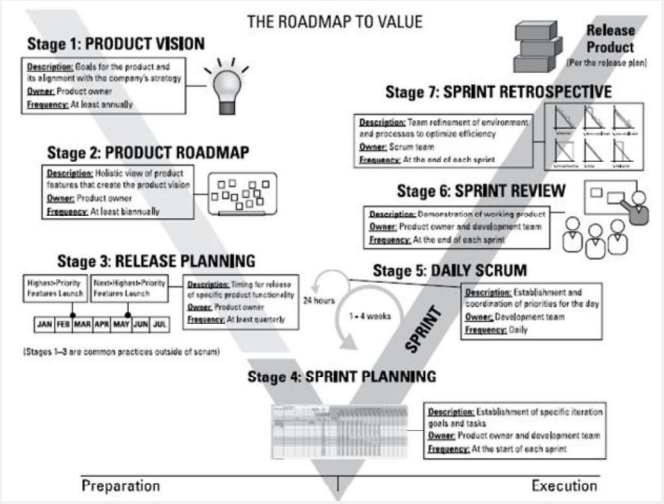
Home loan application

Features –>	Apply	Evaluate	Approve	Pay EMI	Close loan
Release 1	Apply for loan - Single applicant	Check credit history	Verify repayment capacity	Pay EMI - Normal	Close after paying all EMIs
		Determine ability to pay			
		Calculate max loan			
Release 2	Apply for loan - Husband & wife jointly			Pay EMI - after skipping one	
Release 3	Apply for loan - Multiple people				Close by paying remaining amount (Foreclosure)

User stories

Source: https://in.pinterest.com/pin/127086020711755414/?lp=true

Roadmap to value



Product vision

Vision Statement for Product

For _____ (target customer)
who _____ (needs)
the _____ (product name)
is a _____ (product category)
that _____ (product benefit, reason to buy)
Unlike _____ (competitors)
our product _____ (differentiation/value proposition)

Product vision: Example

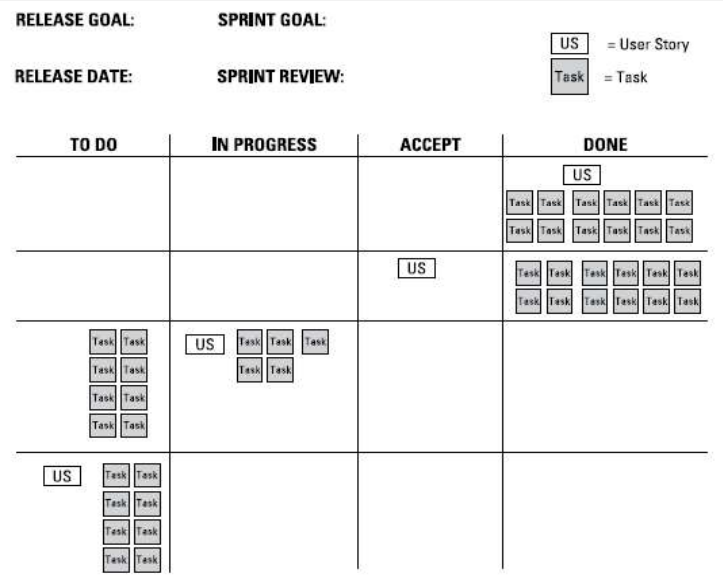
For Progressive Bank customers
who want access to banking capability while on the go,
the MyProgressive
is a mobile application
that allows secure, on-demand banking, 24 hours a day.

Unlike online banking from your home or office computer,
our product allows users immediate access,
which supports our strategy to provide quick, convenient banking services, anytime, anywhere.

Difference between Agile and Scaled Agile

- Agile projects are small 3-9 members
- Scaled Agile projects have multiple Agile teams.
- Coordinating different Agile teams requires additional techniques

Visual progress tracking (Kanban)



Visual progress tracking (Kanban)

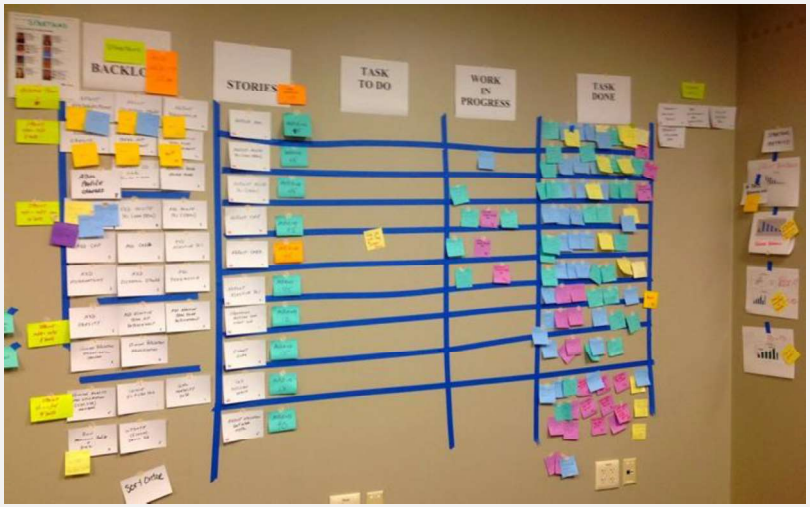


Image source: medium.com/@sashabondareva

Software Project Management

Engineering best practices

BITS Pilani

Nandagopal Govindan

Agenda

- Continuous integration
- Single code base
- Product configuration capability
- API for integration
- Component based design
- Prove value, scale later
- Platform as a product

Continuous integration (CI)

- CI is a practice where developers integrate code into a shared repository frequently
- Each integration is verified by an automated build and automated tests.
- Key benefit is detecting errors quickly and locate them more easily.

Experience sharing: What benefits have you experienced using CI / CD?

Single code case

- Maintaining multiple versions of the software is challenging
- Build a core product with common features needed by target customers
- Maintain a single code base used by all customers

- Sometimes branching strategy is used to cater to different customers, one branch for one customer. But all branches have a common main trunk.

Product configuration capability

Products need customization.

Provide for

- Choice of modules (SAP)
- Configurable work flows (SaleForce)
- Configurable fields (SAP)
- Configurable rules (Navitair airline reservation)
- Configurable UI (look & feel) (Yahoo! Mail)
- Choice of language
- Configurable error messages

- Anything else?

API for integration

APIs to allow external systems to inter-operate with our product

Examples

- Facebook,
- SAP,
- Open API of banks,
- Google Maps,
- Git

Any other example?

Component based design

- Well decomposed system make a system easy to understand, build and maintain
- Web services & Micro-services are examples of components
- Components promote re-use
- They help in easier scaling & fault detection

Prove value of product, Scale later

Do not design for scale from day 1, because we do not know if the product is useful enough

Example: Zendrive

- Zendrive provides insight into driving behaviour such as how does the driver apply brake – sudden or smooth, how safe does the driver turns the vehicle – does he slow down enough before turning, etc.
- It captures data from driver's mobile phone, sends it to the server for analysis.
- Once the product value was proven, they started optimizing the product by aggregating and summarizing data on the phone and sending only summarized data to server, to reduce data transfer time and reduce processing load on central server.

Any other example?

Be open to re-architect

As business grows & expectations change, it may be necessary to re-architect the product

Example

- Amazon: Monolithic software to Micro services based software (2-pizza teams)
- Adobe Creative Suite: Desktop to Cloud
- Oracle apps: On-premise to Cloud
- Any other?

Platform as a product

- Where appropriate, build a platform
- Platform provides a base for building new services (eg Maruti Alto platform)

Example:

- Apple, Android, Firefox browser,
- AWS, Azure (databases, messaging, serverless, monitoring, etc.)
- Eclipse,
- MakeMyTrip,
- Uber,
- AirBnB (During Covid they offered adventure experiences in virtual mode)

Case study: Visio graphics-charting software (sloanreview.mit.edu)

- Scores of plug-in modules are available for Visio software that contain all types of industry- biotechnology, petroleum engineering, insurance accident reporting, and process reengineering
- Domain experts can add-in shapes (Smart shapes) and programs (charting scripts)
- These shapes carry a certain “intelligence” - automatically adjust connections between different shapes when they are moved or resized
- Major components of the platform are:
  - Core graphics engine
  - SmartShape management subsystem for incorporating and then manipulating graphic objects
  - An API that provides a standard scripting language so developers can create and integrate their own plug-in programs into Visio

Appendix

Contents

- User behaviour analytics
- Business analytics
- Financial analytics
- Performance
- Operational costs
- Go-to-market costs
- Sentiment analysis

- A/B testing

- Case study: Improving business through metrics

Introduction

Product teams use analytics to:

- Understand users & then target the right user segments
- Understand customer behaviour and improve UX
- Measure product adoption & increase value
- Measure effectiveness of marketing campaigns

Types of analytics

- User behaviour analytics (click paths, engagement)
- Business analytics (active users, conversion rate, lifetime value, retention)
- Financial analytics (Average selling price, billings)
- Performance (load time, uptime)
- Operational costs (storage, hosting)
- Go-to-market costs (acquisition costs, cost of sales, programs)
- Sentiment (NPS, customer satisfaction, surveys)

Source: "Inspired" Chapter 54)

User behaviour analytics

- Which features are most popular & which are least
- What friction points or issues users are running into
- How engaged users are (How often & how long)
- The type of users – heavy users, occasional users, freeloaders
- What a user workflow looks like

Sample User journey metrics

Source: "Product Analytics for Dummies"

User behaviour analytics

How can we make use of these insights?

- Which features are most popular & which are least?
- What friction points or issues users are running into?
- How engaged users are (How often & how long)?
- Who are our heavy users, occasional users, freeloaders?
- What a user workflow looks like for a given task?

Experience sharing

How did you improve your product based on user behavior analytics?

Business analytics

Dave McClure's AARRR framework

Dave McClure's AARRR framework

- **Acquisition:** How many prospects (new visitors) are our visiting to our website – due to ads, due to Google search, others?
- **Activation / Conversion:** What percentage of prospects that come to our website sign up as customers?
- **Retention:** What percentage of our customers remain active over time?
- **Revenue:** How much money does each customer generate?
- **Referral**: How many customers refer our product to their friends?

Dave McClure's AARRR framework

How does this data help us?

- **Acquisition:** How many prospects (new visitors) are our visiting to our website – due to ads, due to Google search, others?
- **Activation / Conversion:** What percentage of prospects that come to our website sign up as customers?
- **Retention:** What percentage of our customers remain active over time?
- **Revenue:** How much money does each customer generate?
- **Referral**: How many customers refer our product to their friends?

Order of optimization

Which metric should we try to improve first & why?

- Acquisition
- Conversion
- Retention
- Revenue
- Referral

Recommended Order of optimization

1. Retention
2. Conversion
3. Acquisition

Why?

- If we are unable to retain, it implies lack of value

Case study: Intuit
(Improving conversion)

- Launched a new web product,
- Wanted to track and improve the product and business
- Customers were coming but had a conversion problem: the percentage of prospects signing up was lower than we had expected it to be.

Source: Book: Lean Product Playbook

Case study: Intuit…

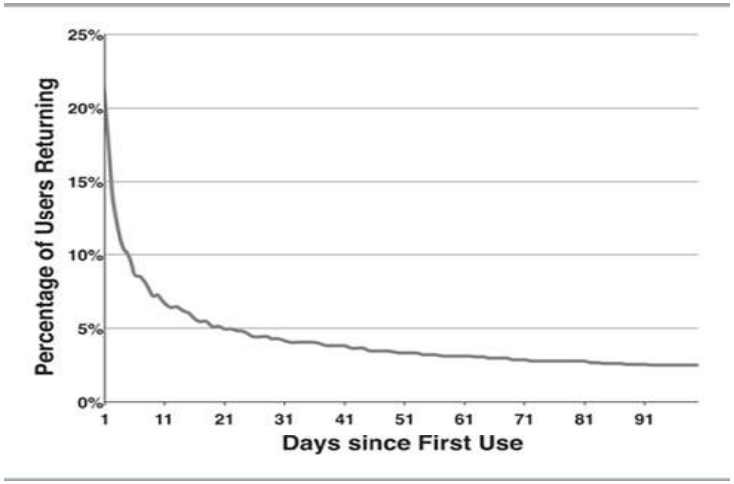
Did analysis & improvements:

- Sign-up process that long.
- Many prospects were dropping off at different points in the sign-up process.
- Conducted usability testing with users - Discovered several UX design issues.
- Quickly made UX design improvements.

Result: 40 percent improvement in our conversion rate

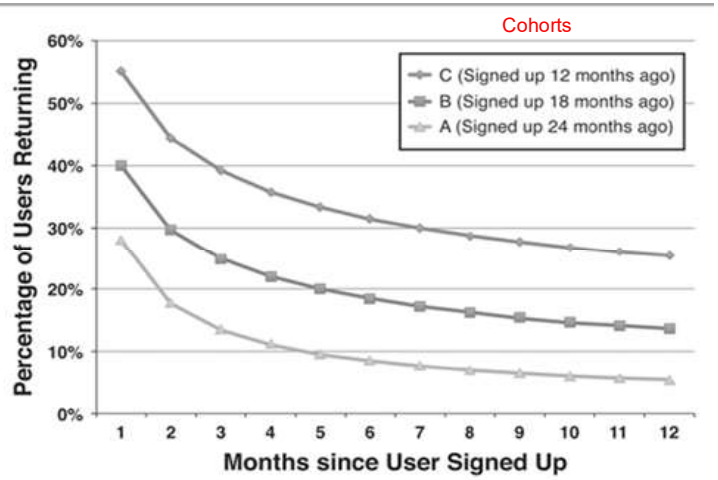
Source: Book: Lean Product Playbook

Measuring retention rate



Source: Book: Lean Product Playbook

Measuring improvement in retention rate



Retention rate of different cohorts, as the product-market fit is improved

Source: Book: Lean Product Playbook

Revenue related metrics

- Average revenue per user: ARPU
  - Example: Amazon, Ola, RazorPay, Slack, Zoom
- Customer Life Time Value = ARPU * Avg. Customer life time (in months or years) * Gross margin

How does this help us in pricing the product?

Sentiment analysis: Net Promoter Score (NPS)

- "How likely are you to recommend the product to your friend?"
  - 9 or 10 are called promoters
  - 7 or 8 are called passives
  - 0 through 6 are called detractors
- NPS = % of promoters - % of detractors
- NPS should increase as you improve product-market fit.
- Include in your survey an open-ended question asking customers *why* they gave the score they did

Experience sharing…

How did you improve your product based on NPS?

A/B testing

- Used when the fear of negative impact of the change is high
- A/B testing can be used to test
  - A change in UI
  - A change in recommendation algorithm
  - New feature
  - Any other?

A/B Testing: Example

- Let us say you have a landing page.
- You see from your analytics that your conversion rate is only 5 percent, much lower than you think it should or could be;
- So you design a new, improved version of the landing page.
- Now you allow a small % of users to see the new landing page and see if the conversion rate improves or not

Concept of statistical significance

- Let us say the conversion rate increased from 5% to 6%
- Is this finding reliable?
- If our sample size is small, it is not very reliable
- If our sample size is large, the finding is more reliable (statistically significant)
- There are tools & formulas to help us determine whether the change is significant or not.

A/B Testing in Netflix

Chief Product Officer Neil Hunt says “We use A/B testing for almost everything”

Examples

- Test out different user interface variations
- Test recommendation algorithms
- Test button placements and sizes

He says “We realize that most of the time, we don't know up-front what customers want. The feedback from testing quickly sets us straight, and helps make sure that our efforts are really focused at optimizing the things that make a difference in the customer experience.”

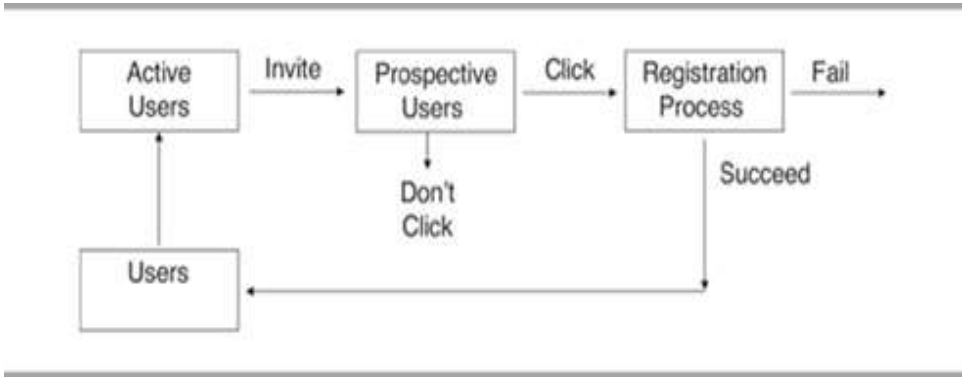
Experience sharing…

For what purpose did you use A/B testing in your product?

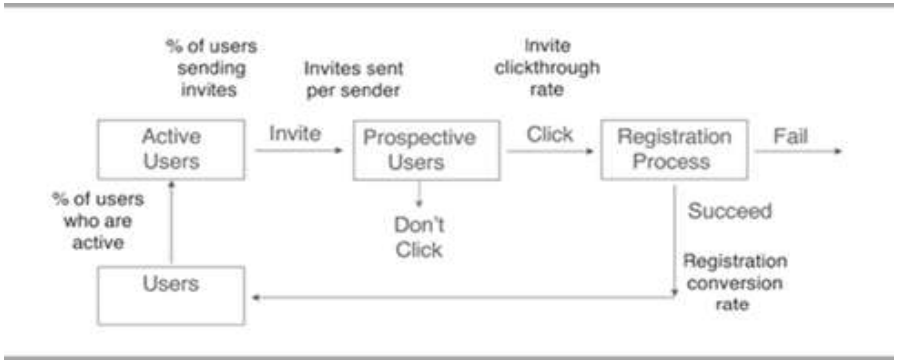
Case study: Friendster's viral loop

Improving revenue by choosing right metrics to improve

Friendster Viral Loop



Friendster Viral Loop Metrics

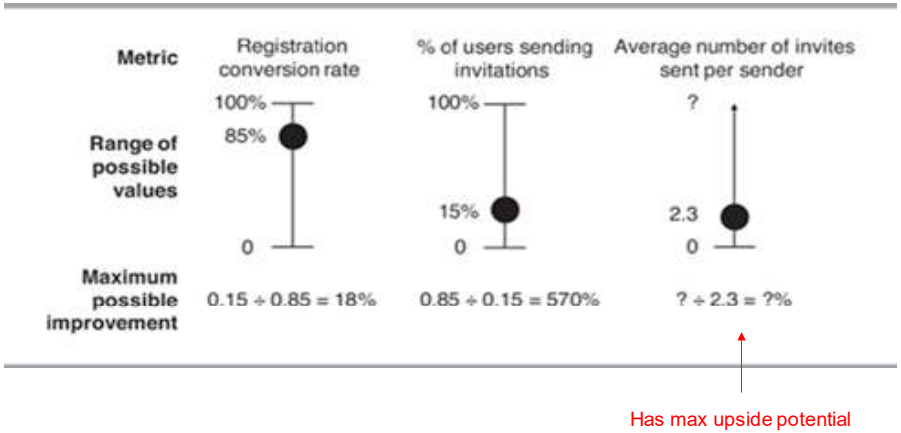


Baseline metrics

- Percentage of users sending invites = 15 percent
- Average number of invites sent per sender = 2.3
- Registration conversion rate = 85 percent

Which metric should we try to improve?

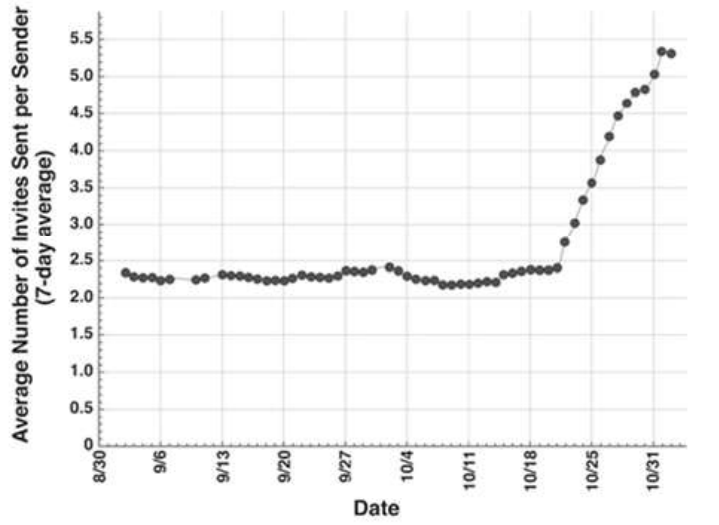
The Upside Potential of a Metric



Action to improve

- Each user has on an average 100-200 friends. Going from 2.3 to 100 will be a significant improvement.
- So we introduced a feature to import address book from Gmail or Yahoo mail and allow user to select the friends they want to send invite to
- This changed the avg invites from 2.3 to 5

Outcome



Exercise

Appendix

Software Product Management

Ongoing product management

BITS Pilani

Nandagopal Govindan

Contents

Introduction

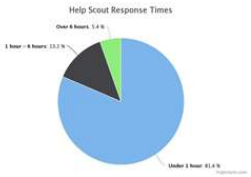
- A new set of activities begin after product release
- Some examples:
  - Resolving customer issues
  - Improving the product – UX, performance, bug fixes, security fix
  - Keep adding value with relevant features – whole product
  - Adapt to changes in user needs, technology, competition
  - Leverage the product – Open source, product line, cater to new segments

Customer support

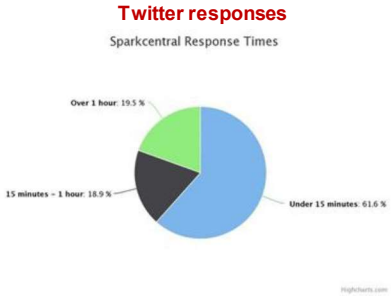
- Quick and effective customer service is paramount. How?
- Make the product so simple to use and so high in quality that support is a non-issue
- Support team should be sufficiently staffed & knowledgeable
- Recruit people who have a high degree of empathy who feel the pain of the customer
- Empower staff to take decisions, example to give refunds where genuine
- Examples of excellence in customer support
  - IBM delivery a small part flying its engineer to customer site,
  - Buffer Inc. provides superior customer support which helps market itself
  - Do you have any examples of great customer service?

Measuring customer service at Buffer Inc.

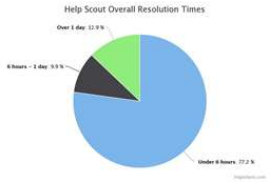
Email responses



Twitter responses



Resolution time



https://buffer.com/resources/june-happiness-report-self-select-urgency/

Support channels

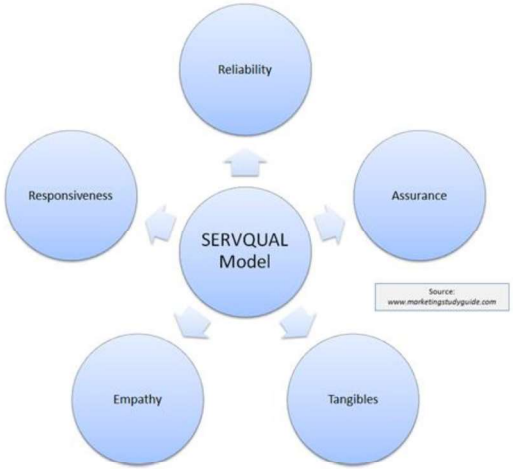
- Several support channels can be used:
  - Email, Twitter, Facebook, Phone, Remote desktop, FAQ, Ticketing system, Bot
  - What channels of support exist in your organization?
- High touch vs low touch:
  - High touch service involves human interaction as against automated systems (IVR), FAQ, etc.
  - Mission critical products such as SAP, Navitaire, Shopify, etc. need high touch support
- Choose the right channel
  - Wistia: How did it optimize support?
  - StudioPress: How did it provide support?

Exceptional service

Service Quality

- Ensure quality of service using concepts of SERVQUAL

What are the characteristics of a service quality (SERVQUAL)?



Which service quality characteristic is most important in your project?

Service Quality

- **Reliability** is the firm's ability to perform the promised service accurately and dependably
- **Responsiveness** is the firm's willingness to help customer and provide prompt service
- **Assurance** is knowledge and courtesy of employees and their ability to inspire trust and confidence
- **Empathy** is caring and individualized attention paid to customers
- **Tangibles** refers to physical facilities, equipment and appearance of personnel

Exercise: SERVQUAL

Which service quality are we referring to in the scenario described below:

•The hotel room has pleasing colours
- Tangibles

•When a problem is fixed, another appears
- Reliability

•When the network fails, it is fixed in 1 hour
- Responsiveness

•The engineer is able to clear all doubts of customer satisfactorily
- Assurance

•The engineer understands the urgency and goes the extra mile to help
- Empathy

Product improvements & enhancements

- Improve the product based on customer feedback
- Example
  - Slack: Integrations with email, channels / group chats
  - Postman: Documenting APIs, Mocking APIs for front end development)
  - Any other?
- Case study in product improvement: How to listen to customers and analyse them before implementing: Interview with Jim Lynch, Salesforce. What can we learn from this case study?


Jim Lynch interview

Experience sharing…

How are customer suggestions analyzed and acted upon in your organization?

Release planning

- Minor releases to fix critical issues
- Major releases containing new features & enhancements

- Feature prioritization can be based on
  - Value to customers
  - Need to match competition
  - Cost of development and support
  - Technical complexity and dependencies
  - Urgency of refactoring

- How does release planning happen in your company?

Case study of product improvement: Word 6.0

- Word 6.0 on Apple Mac OS

Questions:

- Why did Microsoft want to converge Word on Windows with that on Mac?
- Why did they drop this idea?


Word 6.0

Situations triggering Product change

- Changing user needs
  - Amazon Pay-on-delivery
  - Ola SOS button
- Changing regulations – SOX, GST
- Changing standards – Word introduced 'Save as PDF'
- Changing technology
  - Amazon moved from monolithic architecture to Micro-services

- Any other type of change?

- Case study: Adobe Creative Cloud - Desktop to Cloud
  - What were the challenges?
  - How were they overcome?


Adobe case

Experience sharing…

What challenges did you face in making major changes to your product?

Continuous product innovations

- We need to continuously add value to clients
- Examples:
  - Netflix: Online order for DVD rental, recommendations feature to make it easy to choose, video streaming, own productions
  - AirBnB Covid pivot: Virtual experiences – Jungle safari, magic shows, Rio street art
  - BigBasket: Vending machine in apartment complex, Booking delivery slot
  - Women safety in Ola
  - Amazon: eCom, Prime, AWS, Alexa, Amazon Go, …
  - eBay: 'Buy now, Pay later', Buyer seller negotiations, Auto search every day for a product you are looking for
  - Paytm – Video KYC
  - Other examples of continuous innovation?

Software Product Lines

- Examples
  - Telelink inter-office email: supports UUCP, LAN, Netware, RABMN (1990s)
  - Rockwell Collins: Helicopter cockpit system caters to multiple types of helicopters
  - SAP: Caters to Manufacturing, Insurance, Telecom, Retail
  - Any other?
- Product lines share a common set of features
- Achieves order-of-magnitude improvements in time to market, cost, productivity & quality

Case study: Saturn Aviation Diagnostics and Maintenance

https://resources.sei.cmu.edu/library/asset-view.cfm?assetid=21312

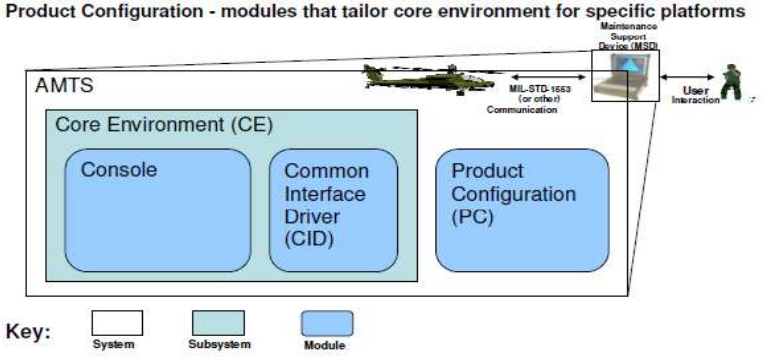
Product Line Features and Variations

Platforms supported	Bus	Message handling
Helo	Type	Message analysis
Apache A	1553 (1553A, 1553B)	From text
Apache D	Ethernet	From XML
UH-60	1773	Message DB
Aircraft	ARINC (commercial aircraft)	XML translator
F-18	CAN? (automotive)	Read
C-17 (under discussion)	Architecture	Write (for sim/stim tool)
Ground vehicles	Single bus	Test level
M1A1 Abrams	Multiple bus	Operational
Variations within each by tail # or other vehicle feature	Single type	Intermediate
	Mixed type	Depot
	Nested (i.e., bus within bus; e.g., JTRS)	Development

Case study: Saturn Aviation Diagnostics and Maintenance

AMTS Decomposition View

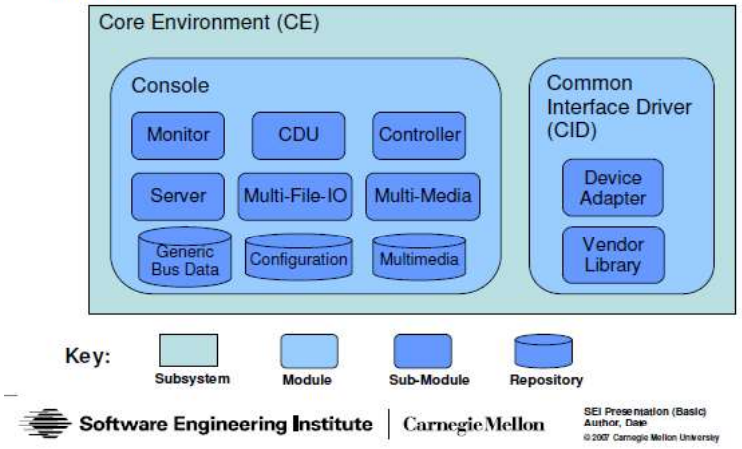
Core Environment - common modules across the product line
Product Configuration - modules that tailor core environment for specific platforms



Case study: Saturn Aviation Diagnostics and Maintenance

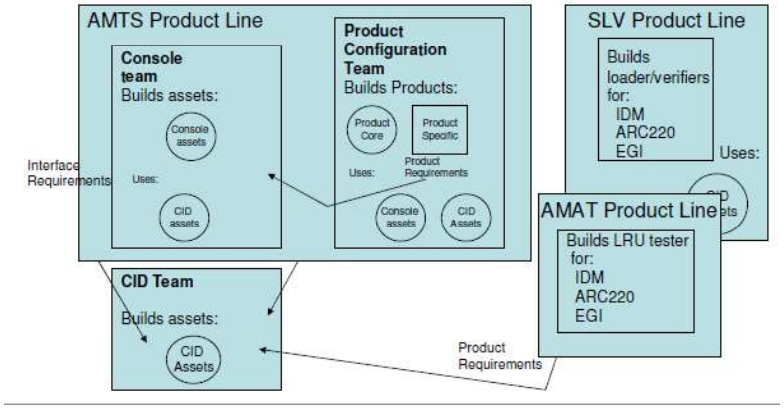
Core Environment Decomposition View

Common assets for building testing systems for specific aviation platforms, systems, and subsystems



Case study: Saturn Aviation Diagnostics and Maintenance

Evolution – Product Line Growth



Lessons in Product lines

- Architecture is the foundation
- Need to identify common elements
- Need to have an organization structure to maintain common elements and build specific products

Experience sharing…

What challenges did you face in developing products using product line concept?

Appendix

Contents

- Product team roles
- Principles of strong product teams
- PM role: Variations across companies
- What it takes to be a good PM
- PM Profile: Jane Manning of Google AdWords

Product Team roles

(Book: Inspired)

Key roles:

- Product Manager
- Designer
- Engineer
- Product Marketing

Product manager

- Overall in-charge of product
- Drive product from concept to development to continuous evolution
- Work closely with UX & Engineering
- Possesses
  - Technology sophistication: knowledge, trends, applications
  - Deep customer knowledge - their issues, pains, desires, how they think, how they work, and how they decide to buy.
  - Market & Industry knowledge: competitors, technology trends, understanding the role of social media for your market and customers, trade magazines, conferences

Designer

- Understands user personas, customer journeys
- Design UX
- Carry out usability testing
- Design for accessibility

Engineer

- Architect the solution
- Develop Proof-of-concept
- Use Agile, DevOps
- Carry out A/B testing

Product marketing

- Understand customer segments & size
- Positioning, messaging, Go-to-market plan
- Measure impact of market campaigns

Principles of strong product teams

(Book: Inspired)

- Missionaries: Need teams committed to solving problems for their customers
- They are empowered to figure out the best way to meet those objectives, and they are accountable for the results
- Team size: Around 8–12 engineers - *two-pizza rule*
- True collaboration – no hierarchy
- Preferably co-located
- Scope well defined: For example, you might be working on a team at eBay that's responsible for detecting and preventing frauds
- Team duration: It takes time to get to know one another, and learn how to work well together. So, teams should stick together longer
- Team autonomy: they are able to try to solve the problems they are assigned in the best way they see fit.

Case study – Stages in Team development

SNAPSHOT FROM PRACTICE

"Rat Fax" Galvanizes ELITE Team at Newspaper*

Knight-Ridder's *Tallahassee Democrat*, like many American newspapers in the late 1980s, was struggling to survive in the face of declining revenues. Fred Mott, the general manager of the *Democrat*, was convinced that the key to the newspaper's future was becoming more customer-focused. Despite his best efforts, little progress was being made toward becoming a customer-driven newspaper. One area that was particularly problematic was advertising, where lost revenues due to errors could be as high as $10,000 a month.

Fred Mott decided to create a team of 12 of his best workers from all parts of the newspaper. They became known as the ELITE team because their mission was to "ELIminate The Errors." At first the team spent a lot of time pointing fingers at each other rather than coming to grips with the error problems at the newspaper. A key turning point came when one member produced what became known as "the rat tracks fax" and told the story behind it. It turns out a sloppily prepared ad arrived through a fax machine looking like "a rat had run across the page." Yet the ad passed through the hands of seven employees and probably would have been printed if it had not been totally unreadable. The introduction of this fax broke the ice, and the team started to admit that everyone—not everyone else—was at fault. Then, recalls one member, "We had some pretty hard discussions. And there were tears at those meetings."

The emotional responses galvanized the group to the task at hand and bonded them to one another. The ELITE team looked carefully at the entire process by which an ad was sold, created, printed, and billed. When the process was examined, the team discovered patterns of errors, most of which could be attributed to bad communication, time pressures, and poor attitude. They made a series of recommendations that completely transformed the ad process at the *Democrat*. Under ELITE's leadership, advertising accuracy rose sharply and stayed above 99 percent. Lost revenues from errors dropped to near zero. Surveys showed a huge positive swing in advertiser satisfaction.

The impact of ELITE, however, went beyond numbers. The ELITE team's own brand of responsiveness to customer satisfaction spread to other parts of the newspaper. In effect this team of mostly frontline workers spearheaded a cultural transformation at the newspaper that emphasized a premium on customer service.

* Jon R. Katzenbach and Douglas K. Smith, *The Wisdom of Teams* (Boston: Harvard Business School Press, 1993), pp. 67–72. Copyright McKinsey & Co., Inc.

Source: Book: Project Management – A Managerial process, by Erik Larson

'Rat Fax' case study

- What was the problem to be solved?
- How did the meetings go in the beginning?
- How did the team own up responsibility?
- What was the impact of the improvement achieved on other teams?
- What are you experiences in team formation and team maturing?

Different stages of a team

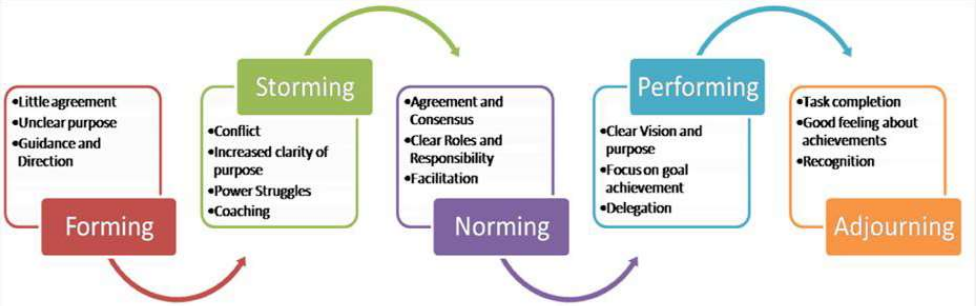


Fig 2: Team Development stages

Created by: Psychologist Bruce Tuckman

Why teaming is important?

- The difference in productivity between an average team and a turned-on, high-performing team is not 10 percent, 20 percent, or 30 percent, but 100 percent, 200 percent, even 500 percent! —Tom Peters, management consultant and writer
- An organization succeeds when people trust each other and cooperate with each other

Case study in building a good team

SNAPSHOT FROM PRACTICE — A Good Man in a Storm*

Once upon a time, back in 1976, Data General Corporation needed to come up quickly with a fast, reasonably priced 32-bit mini-computer to compete with Digital Equipment Corporation's VAX. Data General CEO Edson de Castro launched the Fountainhead Project and gave it the best people and ample resources to complete the 32-bit initiative. As a back-up to the Fountainhead project, Data General created the Eagle project within the Eclipse group under the leadership of Tom West. Work on both projects began in 1978.

In 1980 Data General announced its new computer, featuring simplicity, power, and low cost. This computer was not the Fountainhead from the well-funded "best" DG group but the Eagle from Tom West's under-funded Eclipse team. Tracy Kidder saw all this happen and told the story in *The Soul of a New Machine,* which won a Pulitzer Prize in 1982. This book, which Kidder thought might be of interest to a handful of computer scientists, has become a project management classic.

In the beginning of his book, Kidder introduces the readers to the book's protagonist Tom West by telling the story of him sailing a yacht across rough seas off the coast of New England. Kidder's title for the prologue was "A Good Man in a Storm."

Twenty years after Kidder's book was published Tom West was interviewed by Lawrence Peters for the *Academy of Management Executive.* Below are some excerpts that capture Tom's views on managing innovative projects:

On selecting team members:

> You explain to a guy what the challenge was, and then see if his eyes light up.

On motivating team members:

> . . . Challenge was everything. People, especially creative technical people who really want to make a difference, will do whatever is possible or whatever is necessary. I've done this more than once, and I've repeated it over and over. It seems to work.

On the importance of having a vision:

> . . . you've got to find a rallying cry. You need to have something that can be described very simply and has that sort of ring of truth to an engineer that says "yes that's the thing to be doing right now." Otherwise you're going to be rolling rocks up hill all the time.

On the role of being a project manager:

> You have to act as a cheerleader. You have to act as the instructor. You have to constantly bring to mind what the purpose is and what's moving the ball towards the goal post, and what's running sideways, and you have to take up a lot of battles for them. I mean you really don't want your design engineer arguing with the guy in the drafting shop about why he ought to do it the designer's way. I can do that, and I can pull rank too, and sometimes I did just that.

* Tracy Kidder, *The Soul of a New Machine* (New York: Avon Books, 1981); Lawrence H. Peters, "'A Good Man in a Storm': An Interview with Tom West," *Academy of Management Executive*, Vol. 16, No. 4, 2002, pp. 53–60.

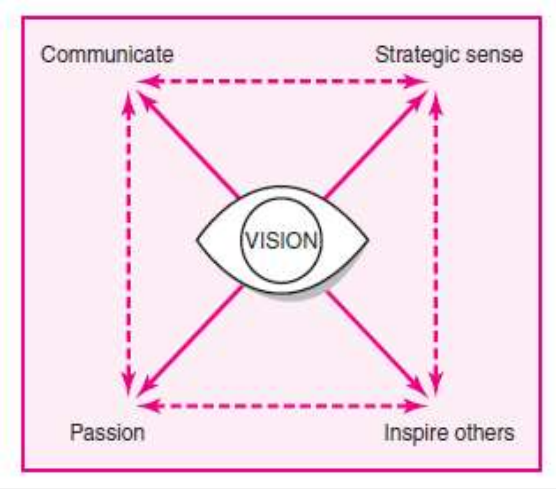
Source: Book: Project Management – A Managerial process, by Erik Larson

Data General case study

- What lessons in team building can we learn from Tom West?

Creating a good vision

Discuss with all



Something that aligns with the strategy of the org.

Vision should have a higher purpose

Something that excites the team

Ex. The CEO of a pharma company said – let us develop a drug that will eradicate Malaria from Africa. This inspired the whole org

Source: Book: Project Management – A Managerial process, by Erik Larson

Exercise: Defining a vision

- Design a vision / goal for your product / project that will truly inspire the entire team

Characteristics of good teams

(Book: Inspired)

1. *Good teams have a compelling product vision that they pursue with a missionary-like passion. Bad teams are mercenaries.*
2. Good teams get their inspiration from observing customers' struggle
3. Good teams are skilled in the many techniques to rapidly try out product ideas
4. Good teams love to have brainstorming discussions with smart thought leaders from across the company.
5. Good teams have product, design, and engineering sit side by side, and they embrace the give and take between the functionality, the user experience, and the enabling technology.
6. Good teams engage directly with customers, to better understand their customers, and to see the customer's response to their latest ideas.
7. Good teams know that many of their favourite ideas won't end up working for customers.
8. Good teams understand the need for speed and how rapid iteration is the key to innovation

Power of a common goal

Apollo 11

- In 1969, Neil Armstrong and Buzz Aldrin became the first men to walk on the moon, a momentous achievement in human history, which is yet to be surpassed.
- While these two men have gone down in history, they wouldn't have made it off the ground without the support of a massive team.
- Over 300,000 men and women collaborated on the Apollo launch, from surveyors to the engineers, to the astronauts themselves.
- Every person that worked on the moon landing understood the goal they were working towards.
- This is best exemplified by President Kennedy's conversation with a janitor when he visited Nasa in 1962.
- When the president asked him what he did, the man proudly replied. "I'm helping to put a man on the moon."

How do you think this must have happened – even the janitor is inspired?

Ref: vouchforme.co

Example of great team work in nature

Look at how the Geese fly:

- Human teams could learn a lot about teamwork by observing Geese.
- Every winter, flocks of Geese take to the skies and work together to achieve their common goal of reaching a warmer climate.
- Common errors with human teams include lack of communication and allowing some members to take all the pressure while others coast through, but flocks of Geese never have these problems.
- As they fly, they honk loudly, motivating their tired teammates, and by flying in a V-shape formation, the leaders reduce air drag for those behind them.
- When the lead Goose is struggling, another one from the back swaps to give their companion a break.
- The result means that all members of the flock work and recover equally.

- What can we learn from the geese?

Ref: vouchforme.co

Some aspects of team: Few Questions

innovate achieve lead

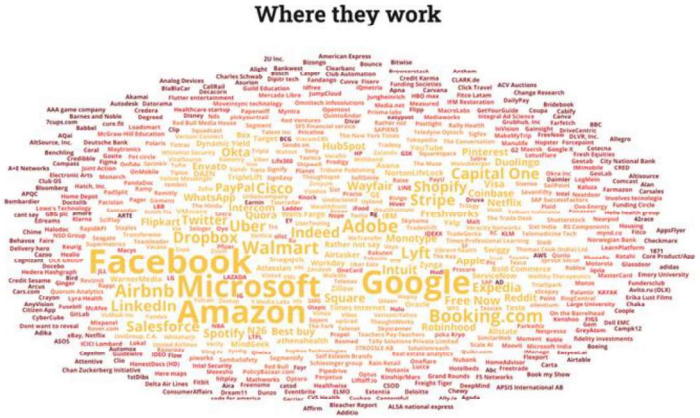
- Do you participate in customer meetings, do you visit the customer?
- How can you deeply understand the customer needs in your product ?

- Do you consider different ideas from team members to solve a complex issue?
- How can you bring in a culture of collective problem solving in your team?

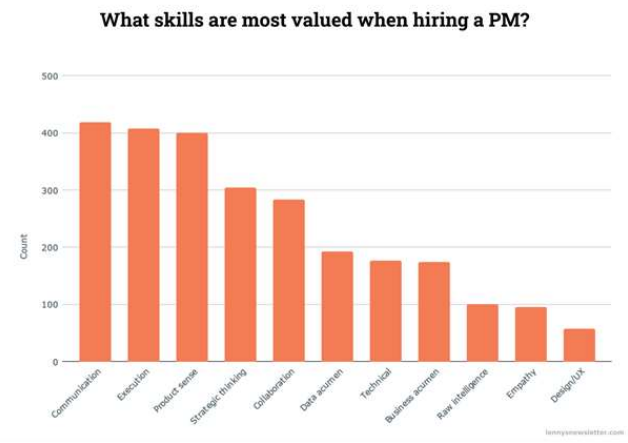
How PM roles different in different companies? A survey (lennysnewsletter.com)

innovate achieve lead

- Survey participants
- Year:

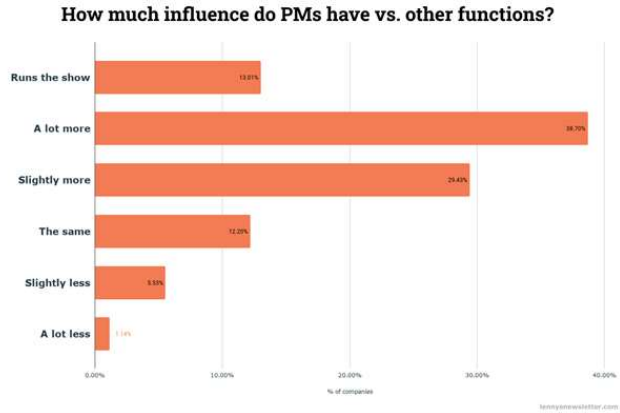


Survey results…



- **Most frequently valued**: Communication, execution, product sense
- **Least frequently valued**: Design/UX, empathy, raw intelligence

Survey results…



- **Noteworthy companies where PMs have a lot more influence**: YouTube, LinkedIn, Twitter, Uber, Robinhood, Lyft, Coinbase, Asana, Airbnb
- **Noteworthy companies where PMs have relatively less influence**: Apple, Oracle, Stripe, Tesla

Survey results…

Heart vs. Hands vs. Head

It's often said that companies are defined by how they index on Heart (e.g. empathy, culture) vs. Hands (e.g. execution) vs. Head (e.g. intelligence).

Takeaways:

- Companies who spike on **Heart**: Asana, Spotify, WhatsApp
- Companies who spike on **Hands**: Flipkart, Okta, PayPal, Quora, Tesla, Wayfair, Yelp
- Companies who spike on **Head**: Coinbase, Uber, YouTube, Zynga

To which category does your company largely belong?

What it takes to be a good PM?

(hbr.org)

Aspiring PMs should consider three primary factors when evaluating a role:

- Core competencies
- Emotional intelligence (EQ)
- Company fit

Core competencies

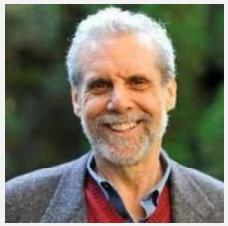
(hbr.org)

- Conducting customer interviews and user testing
- Running design sprints
- Feature prioritization and road map planning
- The art of resource allocation (it is not a science!)
- Performing market assessments
- Translating business-to-technical requirements, and vice versa
- Pricing and revenue modeling
- Defining and tracking success metrics

- Rate yourself on a scale of 1 to 5 on each of these and identify areas for improvement. Do not share in chat box.
- Identify one key action to improve in one key area where you are weak. Do not share in the chat box.
- After the class, create an action plan and monitor progress every month. Promise?

Emotional Intelligence

- Emotional intelligence or EI is the ability to understand and manage your own emotions, and those of the people around you
- The theory behind this was proposed by Daniel Goleman
- EQ is considered to be greater than IQ. This is the reason many intelligent people do not make great leaders if they lack in EQ



Daniel Goleman

Emotional intelligence

Emotional Intelligence Domains and Competencies

SELF-AWARENESS	SELF-MANAGEMENT	SOCIAL AWARENESS	RELATIONSHIP MANAGEMENT
Emotional self-awareness Emotions, strengths, weaknesses, drives, values and goals	Emotional self-control	Empathy	Influence
	Adaptability		Coach and mentor
	Achievement orientation	Organizational awareness	Conflict management
	Positive outlook		Teamwork
			Inspirational leadership

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Scene in an emotionally intelligent office

- An upset employee finds a compassionate ear. ...
- People listen to each other in meetings. ...
- People express themselves openly. ...
- Most change initiatives work. ...
- Flexibility. ...
- People have the freedom to be creative. ...

https://magazinestoday.co.nz/7-great-examples-emotional-intelligence-workplace/People meet out of work time.

Example of High EQ person – JRD Tata

- Made friends easily
- Ran the Tata group consisting of several top notch CEOs like Russi Modi (Tata Steel), Moolgaokar (Tata Motors)…
- Gave them freedom, compromised his own opinions in order to respect them
- Bold & Adventurous – Tata Airlines then became Air India

Importance of EQ

- Video: https://www.youtube.com/watch?v=wJhfKYzKc0s

Leadership styles

- Democratic
- Authoritative
- Coercive
- Coaching

Leadership styles…

- Democratic: Trusts people to do the right things, Listens to concerns. Works best when employees are knowledgeable and only need coordination
- Authoritative: Articulates vision and approach, Sets standards & monitors performance. Best when team is new and not very skilled and PM is an expert
- Coercive: Gives lot of directives, Expects immediate compliance, Close monitoring & control. Best during a crisis, when minor deviations might result in serious problems, dealing with problem employees, applied to straight forward tasks
- Coaching: Helps employees identify unique strengths and weaknesses, encourages team members to establish long term development goals. Best when the engagement is a long one 2-4 years

Company fit

(hbr.org)

- Technical skills needed: Some products are very technical – AI, Analytics
- Company philosophy about PM (relationship with engineering) – PM drives engineering, Engineering drives Product, Partnership
- Stage of company: Startup (broad exposure & expectations), mature (more focused role)
- Relationship with Leadership: Level of Autonomy to PMs

Profile: Jane Manning of Google AdWords

Jane Manning

Questions:

- What challenges of a PM are highlighted in this article?
- What qualities of Jane do you appreciate and why?

Appendix

Contents

- Purpose of business plan
- Contents of a business plan
- What investors look for
- Example: Airbnb pitch

Purpose

- The business plan is a tool to think through different aspects of our business, identify issues and remedial measures.
- It is also used to secure finance from Venture capitalists.

Contents of a business plan: Typical

- Executive summary
- Product & its value
- Market size
- Competition
- Marketing strategy
- Operational plan
- People strength
- Financial forecasts
- Key risks & mitigation plan
- Conclusion
  Appendices

Product & its value

- Product-Market-fit
  - Customer segment
  - Problem / Under-served need
  - Solution / Value proposition
- Goal (SMART)
  Example:
  - To be the most children-centric provider of online stories in the next 5 years
  - Achieve a C-Sat rating of 4.5 / 5 in 5 years

Market size

- Available market and addressable market (people to whom you can reach out to and serve)

- Example:
  - Instrument to help throat cancer patients to speak after their throat surgery.
  - 30,000 patients a year are diagnosed with cancer of the larynx in India

Dr. Vishal Rao

(https://www.bbc.com/news/business-41969801
https://www.thebetterindia.com/41251/dr-vishal-rao-affordable-voice-prosthesis/

What is the market size for

a) Online children stories
b) Online library of BE student books
c) Product recommendation & consulting business

Competition

- Who are the competitors
- Their revenue
- Their Growth
- Their Strategy – main focus of their strategy, pricing policy, sales pitch

Who are the competitors who impact the addressable market?

a) Online children stories
b) Online library of BE student books
c) Product recommendation & consulting business

Marketing strategy

Different aspects of marketing strategy:

- Create awareness about the product (Ex. Press release, SEO)
- Create a set of high profile reference customers (Ex. Kissflow)
- Differentiate on quality, simplicity, price, service

What would be your marketing strategy for:

a) Online children stories
b) Online library of BE student books
c) Product recommendation & consulting business

Operational plan

- Product development plan
- Release milestones
- Service and support plan

What is your release plan for

a) Online children stories
b) Online library of BE student books
c) Product recommendation & consulting business

What is your customer support & service plan for

a) Online children stories
b) Online library of BE student books
c) Product recommendation & consulting business

People strength

- Experience of Management staff
  - Management experience
  - Domain knowledge
- Experience of Technical staff
- Experience of Marketing staff

What type of skills & resources do you need to develop this product?

a) Online children stories
b) Online library of BE student books
c) Product recommendation & consulting business

Financial forecast

- Sales forecast
- Break-even analysis
- Profit & loss projections
- Cash flow projections
- Balance sheet forecast

Sales forecast

Year	# of customers	Revenue ($)
2021	1,000	10 Million
2022	3,000	30 Million
2023	10,000	100 Million

Break-Even Analysis

Example of break even

Exercise in Break even

What costs will we be incurring each year in developing and marketing this product?

a) Online children stories
b) Online library of BE student books
c) Product recommendation & consulting business

What revenues can we expect each year from this product?

a) Online children stories
b) Online library of BE student books
c) Product recommendation & consulting business

- When will be reach break-even?

Profit & Loss statement

Sales revenue
  less direct costs (labour, tools)
Gross profit
Gross margin (%)
  less depreciation
  less other overheads
Operating profit
Operating margin (%)
  plus other income
EBIT (Earning before income & Tax)
  less interest
PBT (Profit before tax)
  less tax
PAT (Profit after tax, aka Net profit)
Net margin (%)

Gives an idea about the revenue, expenses and profit or loss for a period.

Cash flow statement

Cash flowing in	Cash flowing out
• Receipt of cash from sales (may be delayed due to payment terms) • Loans • Equity proceeds (sale of equity)	• Rent & infrastructure expenses • Salaries • Repayment of loan • Purchase of equipment

Tells whether there is enough cash coming in to meet the expenses

Balance sheet example

TEDDY FAB INC.
BALANCE SHEET
December 31, 2100

ASSETS		LIABILITIES AND SHAREHOLDERS' EQUITY	
Current assets		**Current liabilities**	
Cash and cash equivalents	$ 100,000	Accounts payable	$ 30,000
Accounts receivable	20,000	Notes payable	10,000
Inventory	15,000	Accrued expenses	5,000
Prepaid expense	4,000	Deferred revenue	2,000
Investments	10,000	Total current liabilities	47,000
Total current assets	149,000		
		Long-term debt	200,000
Property and equipment			
Land	24,300	**Total liabilities**	247,000
Buildings and improvements	250,000		
Equipment	50,000	**Shareholders' Equity**	
Less accumulated depreciation	(5,000)	Common stock	10,000
		Additional paid-in capital	20,000
Other assets		Retained earnings	197,100
Intangible assets	4,000	Treasury stock	(2,000)
Less accumulated amortization	(200)		
		Total liabilities and shareholders' equity	$ 472,100
Total assets	$ 472,100		

Talks about assets, liabilities and equity on a specific date

Risks and mitigation plan

What risks do you see in this product business?

a) Online children stories
b) Online library of BE student books
c) Product recommendation & consulting business

Risks and mitigation plan

How do you plan to address these risks?

a) Online children stories
b) Online library of BE student books
c) Product recommendation & consulting business

Risks & mitigation plan

Example

#	Risk	Impact	Probability	Score	Mitigation plan
1	Competition may come up with a similar product	High (9)	Low (2)	18	a) Keep a close watch on the market b) Differentiate by addressing needs of a subset of the market
2	We may need more number of iterations to prove MVP	Medium (5)	Medium (5)	25	a) Study the market deeper b) Identify 5-6 customers to work closely during MVP testing phase c) Create rough working models to save on time

What investors look for in the business plan

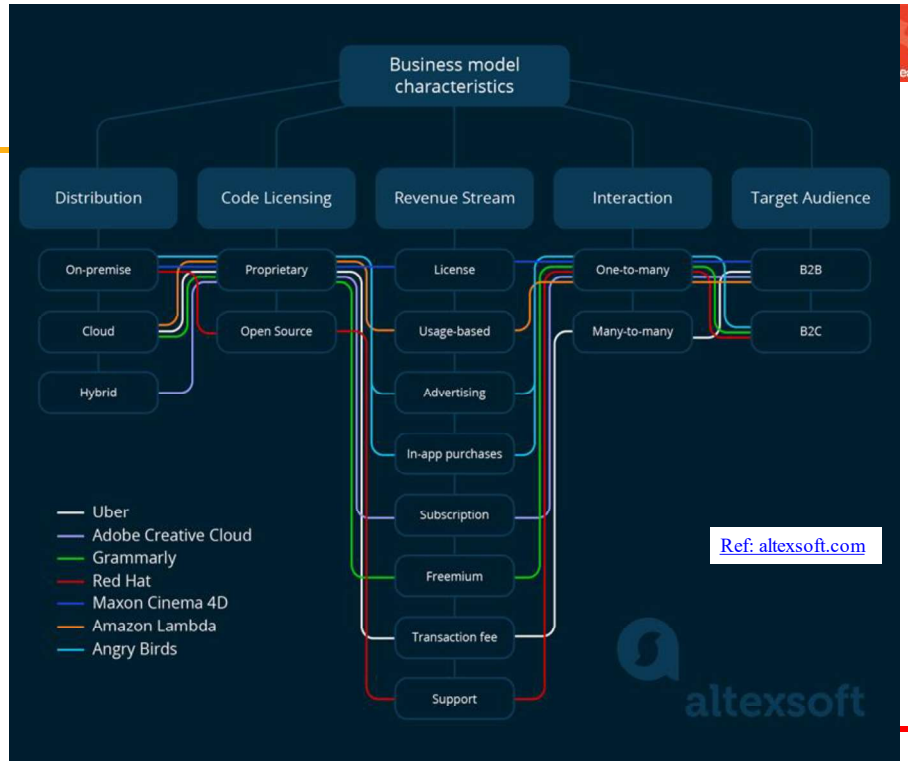
- Is there real value in the product?
- Is there a good growth potential?
- Does the team have the ability to deliver?
- Is the plan good enough?
- Are the financial projections realistic?

Example Business plan: AirBnB

AirBnB pitch

- What are the strengths of this business plan?
- How can this plan be improved?

Appendix



Revenue streams

Type	Description / Example
Licenses	One-time upfront license fee + fee for upgrades and support
Subscriptions	Salesforce, Financial Times, Spotify
Usage based	AWS, AWS Lamda, MailChimp, ShutterStock.
Freemium	Free & Premium versions: Grammarly, Tinder, Zapier
Transaction fee	AirBnB, Uber, eBay, Payment Gateway
Advertising	Google Search, Angry Birds, Facebook, Twitter. Google
In-app purchase	VSCO, Meet Me
App store	Commission on app sold: SAP EcoHuub, Microsoft solution finder
IP licensing	Google leasing Chrome browser & Android OS for purpose built device

Exercise

What revenue stream model would do you recommend for this product business and why?

a) Online children stories
b) Online library of BE student books
c) Product recommendation & consulting business

Contents

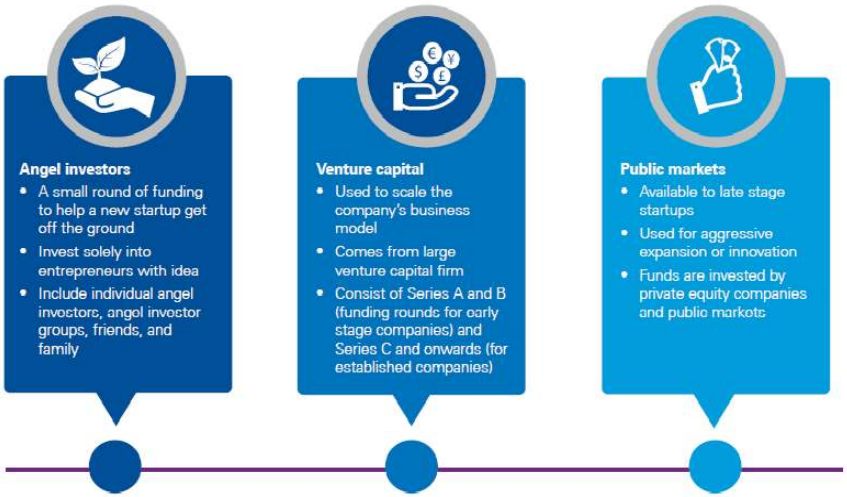
- Funding sources
- Funding stages
- Angel investors
- Venture Capital firms
- Crowd funding
- Incubators and Accelerators

Funding sources

quicksprout.com

Funding stages

Figure 4: Startup financing life cycle



Source: KPMG report

Angel investors

- Fund the company at a very early stage
- Although money is their motivation, they are more likely to be genuinely interested in your business as well as the growth and development of particular industries.
- They are typically entrepreneurs or former entrepreneurs themselves.
- If you find the right angel investor, you may benefit from their expert advice and management skills.
- Some Angel Investors
  - Rajan Anandan.
  - Anupam Mittal. ...
  - Anand Ladsariya. ...
  - Sanjay Mehta. ...
  - Ratan Tata. ...
  - Vijay Shekhar Sharma. ...
  - Kunal Bahl

Venture Capital firms

- Stage 1
  - Wealthy people give their money to VC firms
- Stage 2:
  - VC firms invest this money in startups after due diligence. VC firms take more risk compared to banks
  - VC forms get a share (15%-30%) in the company for their investment
  - VC firms sit on the board of Directors where they participate in making important decisions
- Stage 3:
  - When the startup company gets acquired by another company or it goes public (IPO) they get their money back
  - They usually aim for 10x returns of their investment over 5-7 years
  - They tend to invest in a few verticals which they understand well
    - E-Commerce, Deeptech, FinTech, EdTech, AgriTech, Travel Tech, Logistics, HealthTech

Example of returns on investment for VCs

Company	Investor	Fund invested	Return on investment	Acquirer/IPO
Flipkart	Tiger Global	INR64 billion (USD1 billion)	300%	A Japanese based investment company (part exit in 2017) An American retail company (2018)
	A Japanese based investment company[36]	INR160 billion (USD2.5 billion)	60%	An American retail company
	Naspers	INR140 billion (USD2.2 billion)	32%	
	Accel Partners	INR10 billion (USD160 million)	~625%	
Ola	Tiger Global[37]	INR7.7 billion (USD120 million)	363%	A Japanese investment company
An Indian e-commerce payment system	A venture and growth capital fund[38]	INR4.8 billion (USD75 million)	533%	A Japanese investment company
	A Indian conglomerate[39]	INR100 million	2650%	Alibaba
	An India focused venture capital fund	NA	7438%	
	A U.S. based venture capital firm	NA	1648%	
Vini Cometics	Bay Capital	~INR290 million (USD4.6 million)	1700%	WestBridge

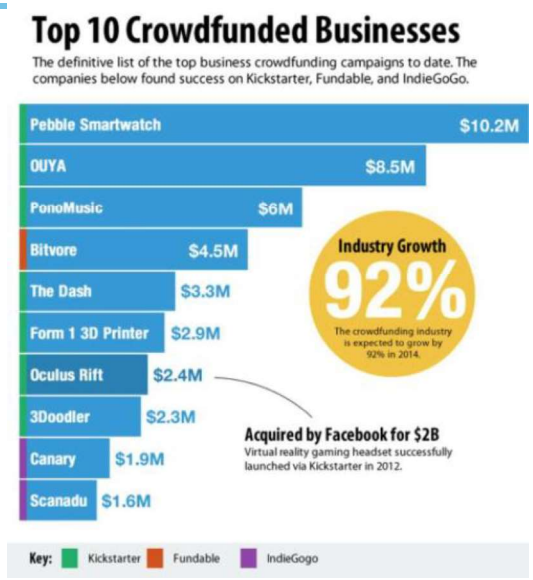
Example: VC Firms

Venture Capital Firm	Domain / Vertical	Start ups Funded
Accel Partners	Infrastructure, Mobile & Software, Internet and Consumer Services	Myntra, BookMyShow, BabyOYE, Freshdesk, Flipkart etc.
SEQUOIA CAPITAL	Healthcare, Consumer Internet, Financial Sector and Technology	JustDial, Zomato, Practo, Groupon etc.
NEXUS VENTURE PARTNERS	Data Security, Mobile, Infrastructure, Bio Data Analytics, Agribusiness, Consumer and Business Services	Craftsvilla, Snapdeal, Shopclues, etc.
KALAARI CAPITAL	Internet, ECommerce, Curated Web	Snapdeal, ScoopWhoop, Myntra, Urban Ladder, Instamojo etc.
BLUME VENTURES	Mobile Applications, Internet & Software Sectors, Telecommunication Equipments, Research and Development	Cashify, HealthifyMe, TaxiForSure, Belong etc.

Crowd funding

Examples

- Kickstarter
- AngelList
- CircleUp
- CrowdFunder
- Fundable



Source: quicksprout.com

Incubators & Accelerators

Incubator services

- Office space
- Research labs
- Mentorship
- Assist in raising capital

Accelerators

- Build prototypes
- Help in fund raising
- Brand building
- Customer growth

Example incubators and accelerators

Bangalore

- Microsoft Accelerator
- Khosla Labs
- NSRCEL, IIM Bangalore
- IIIT Bangalore Innovation
- Nasscom 10,000 Startup

Mumbai

- Society for Innovation & Entrepreneurship, IIT Mumbai
- United India
- Venture nursery

Delhi

- Indian Angel Network Incubator, New Delhi
- Startup Tunnel
- GSF
- TiE

International

Y Combinator and Techstars

Experience sharing

- Have you had any experience with raising capital from Angel investors or Venture capital firms?

Appendix

Software Product Management

Marketing

BITS Pilani

Nandagopal Govindan

Marketing concepts for Product managers

Contents

- Concepts in marketing
- 4Ps of marketing
- Pricing strategies
- Positioning & messaging (Al Reis)
- Product marketing
- Content marketing
- Go to market strategy

Definition

What is marketing?

- American Marketing association "….. creating, communicating, delivering offerings that have value for customers, clients, …"
- Peter Drucker "… Aim of marketing is to make sales superfluous. …. Understand the customer so well that the product sells itself…."

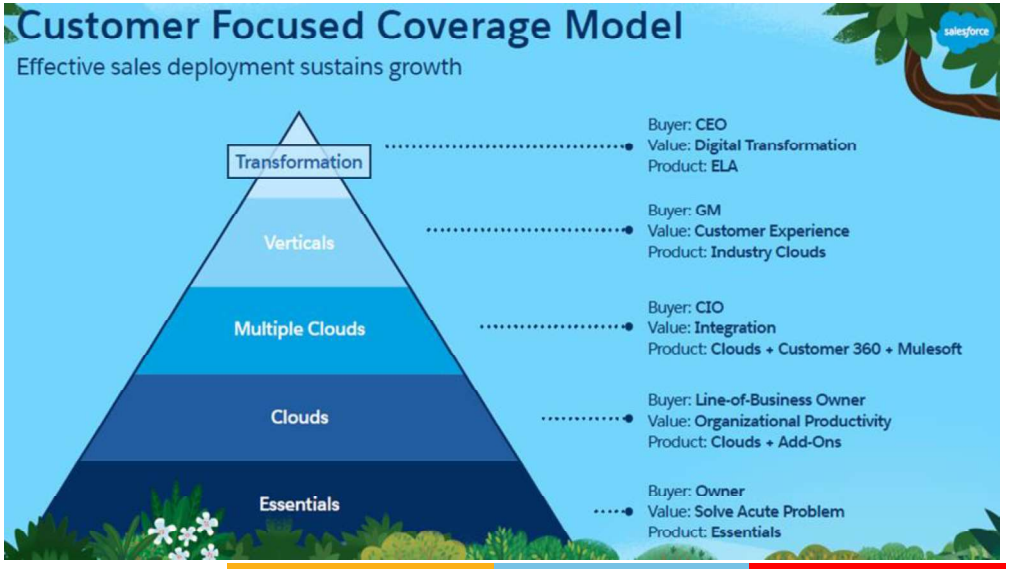
Concepts in Marketing

(Marketing Management book by Philip Kotler)

- Customer needs
  - Stated (inexpensive car),
  - Unstated (Good service),
  - Delights (Onboard GPS)

- Target market & Segmentation: Some examples
  - By Industry to which customer belongs
  - By Customer size and sales potential
  - By Geography

How does Salesforce address different customers segments?



Concepts in Marketing

(Marketing Management book by Philip Kotler)

Positioning:

- Creates a position in the prospects mind based on the value of the product to the market segment and how different it is from the competition

- Examples
  - Volvo - Safest car
  - Porsche - Pleasurable and exciting driving experience
  - Toyota – High quality

  - Accenture: Innovative solutions (“Innovation delivered”)
  - TCS: Value for money

  - Apple: Innovative, Creative
  - SalesForce: User friendly – Easy to setup, easy to use, customizable
  - AirBnB: Local experience
  - BYJU’s: High quality coaching

Ways to position

- Be the first:
  - People remember Neil Armstrong was the first to land on moon. Not many remember his colleague who landed next
  - People remember BigBasket for grocery and vegetables because it entered the market first (First mover advantage)

- Find a niche:
  - Apna is a job finder for blue collar workers
  - Tally is for Small and Medium Enterprises

- Differentiate from competition
  - Sketch is very easy to use compared to Photoshop
  - Progressive Auto Insurance is quick claim settlement

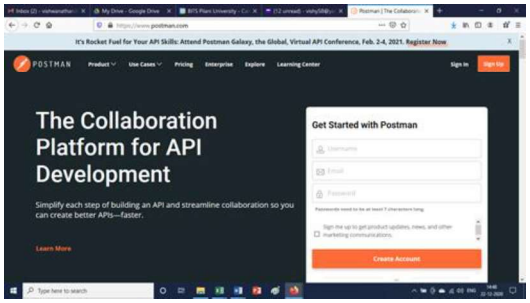
Exercise

How can you help position these products?

- Postman
- Kissflow

Messaging

- Positioning & Messaging are closely linked
- Messaging is how you communicate value proposition using simple & clear words
- Messaging of Postman:



Messaging: AirBnB

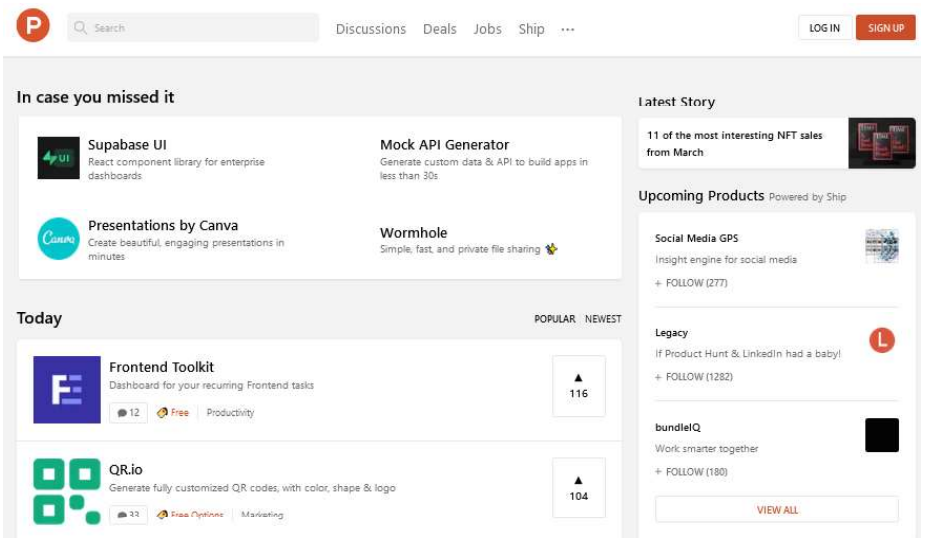
Messaging: Example

Messaging example: iPad

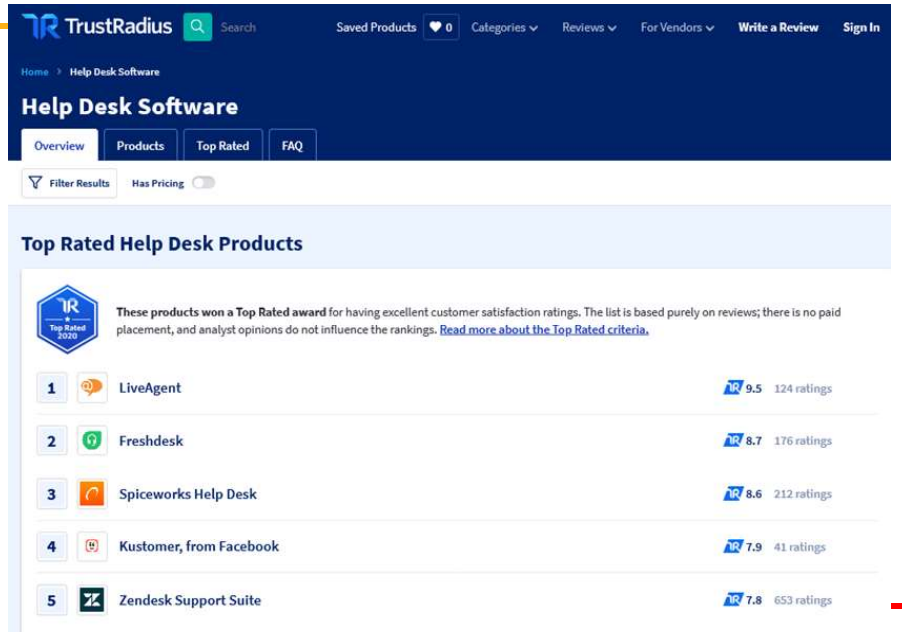
Concepts in Marketing

- Branding
  - *Branding* helps to identify a product and distinguish it from other products and services.
  - Branding consists of Logo, name, mission, values
  - Apple creates an image of creative, innovation, easy to use
- Marketing channels
  - Communication channels: newspaper, magazine, mail, internet, blogs
  - Distribution channels: Direct (Internet) and indirect (distributors, retailers, associates)
- Paid, owned and earned media
  - Paid: Newspaper, paid search (Google AdWords)
  - Owned: Web site, blog, Facebook page, Twitter account, LinkedIn
  - Earned: When press, consumers talk about the brand (word of mouth, viral marketing), Trust Radius, Capterra, Product Hunt

Product Hunt: Best new products in tech website



Trust Radius: Software reviews & comparisons website



Concepts in Marketing

- Impression & engagement
  - Impression: How many viewed the advertisement
  - Engagement: How many “Like”, how many tweeted about it, how many commented on blog, how many shared your content such as video, with their friends & colleagues

- Value & satisfaction
  - Depends on quality, service and price

Competitor analysis

Concepts in Marketing

Consumer adoption process (Funnel)

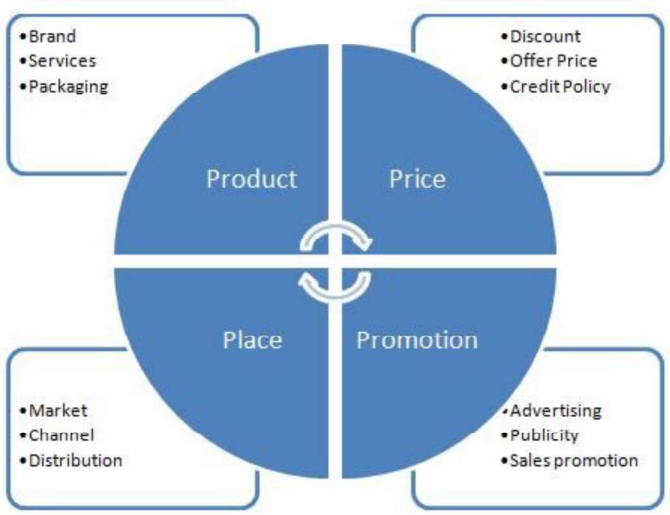
- Awareness
- Interest
- Evaluation
- Trial
- Adoption

Concepts in Marketing

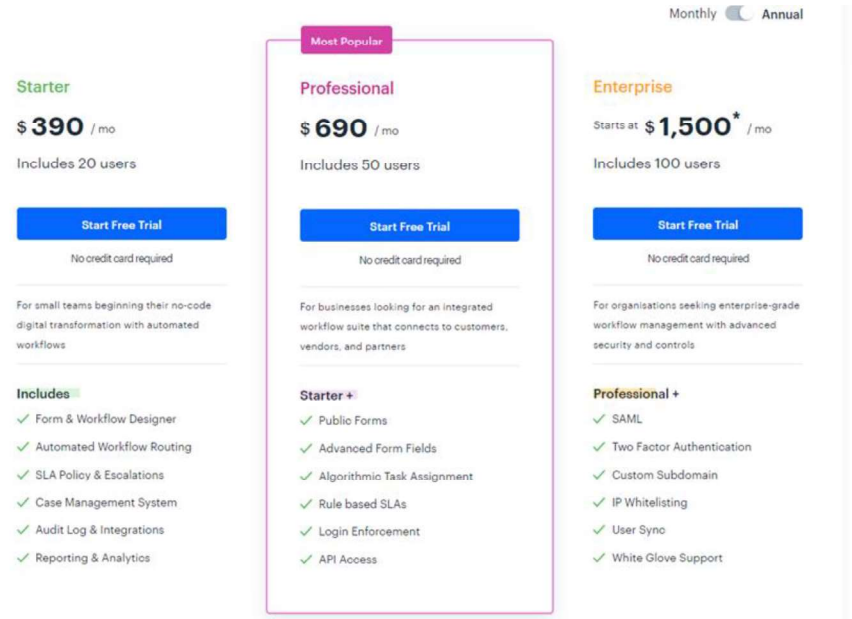
Marketing communication mix

- Advertisement (Newspaper, Magazine, Internet)
- Sales promotion (short term incentive)
- Events & experiences (webinars)
- Public relations & publicity (CSR activity)
- Online and social media marketing (web sites, blogs, Facebook & Twitter channels, Influencers, search ads, engage customers)
- Mobile marketing
- Direct & database marketing (email, Mailchimp)
- Personal selling (face to face presentations)

4Ps of marketing



Pricing example: Kissflow



Pricing considerations

Some considerations

- Affordability
- Expectations
- Competition
- Value generated
- Market size

Example Bounce:

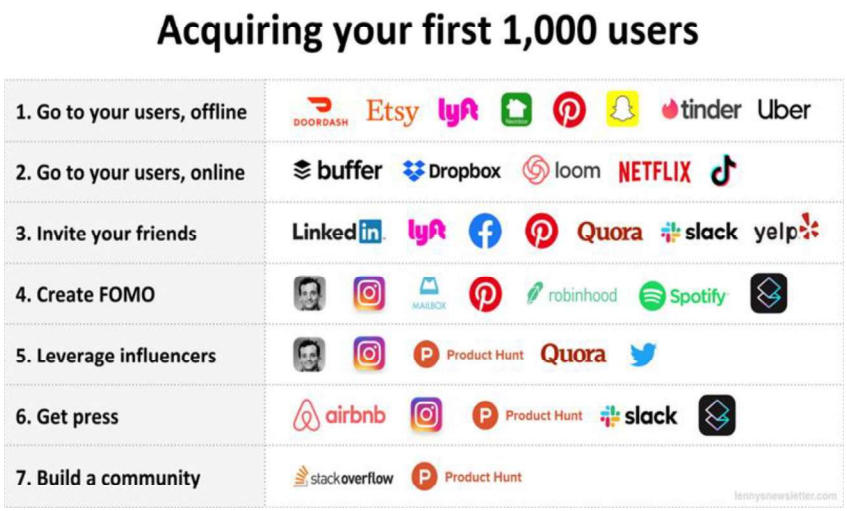
We can consider how much user is currently spending to reach Metro station. Can we price it below this?

Exercise

What factors will you consider to price these products? Justify

- Slack:
  - Value due to easier collaboration and productivity increase
- Spotify:
  - Affordability & Expectations
- Postman:
  - Price of Testing tools, other development tools
- KissFlow:
  - Increase in productivity

B2C: How they got their first 1,000 users (lennysnewsletter.com)

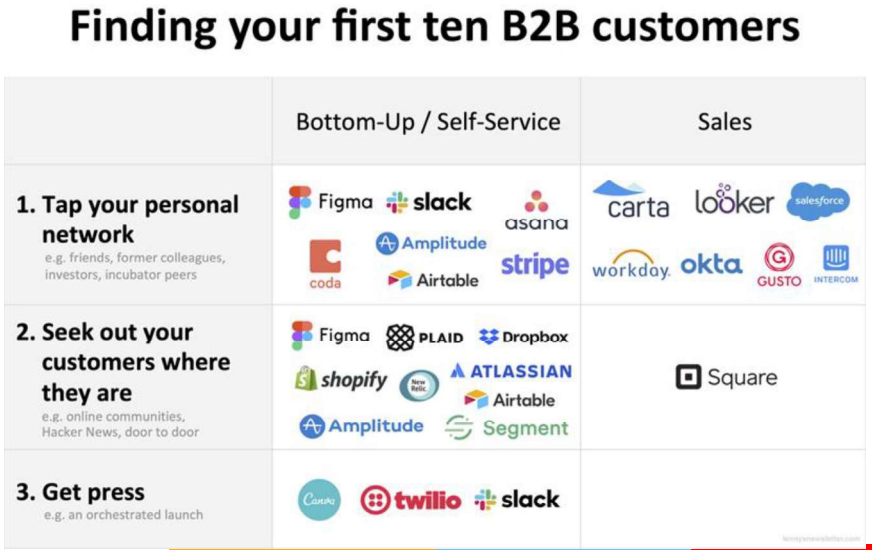


B2C: How they got their first 1000 users – B2C

1. Offline: Visit College campus, Malls, Exhibitions, Transit hubs, Startup office
2. Online: Publish on HackerNews (DropBox), App store (TikTok), Product Hunt (Loom),
3. Invite your friends: Slack did it
4. Create FOMO: (Fear of missing out): use tactics like by Invite only, Waiting list,
5. Leverage influencers: Invite a person who is respected by the customer community to join / subscribe
6. Get press: Write an article in magazines
7. Build community: Invite supporters to join

B2B: How they found their first ten customers?

(lennysnewsletter.com)



Content marketing

- Content marketing is strategic marketing and business process focused on creating and distributing valuable, relevant, and consistent content to attract and retain a clearly defined audience, and, ultimately, drive profitable customer action. (*HubSpot*)

- Important for Search Engine Optimisation
- Building and engaging a lasting relationship with your audience
- Increase brand credibility and loyalty

Examples of content marketing

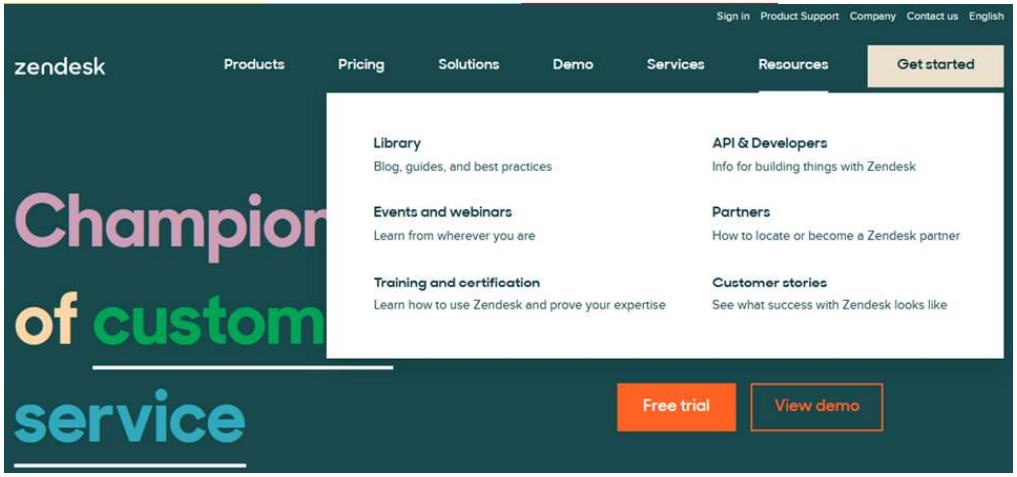
Workday

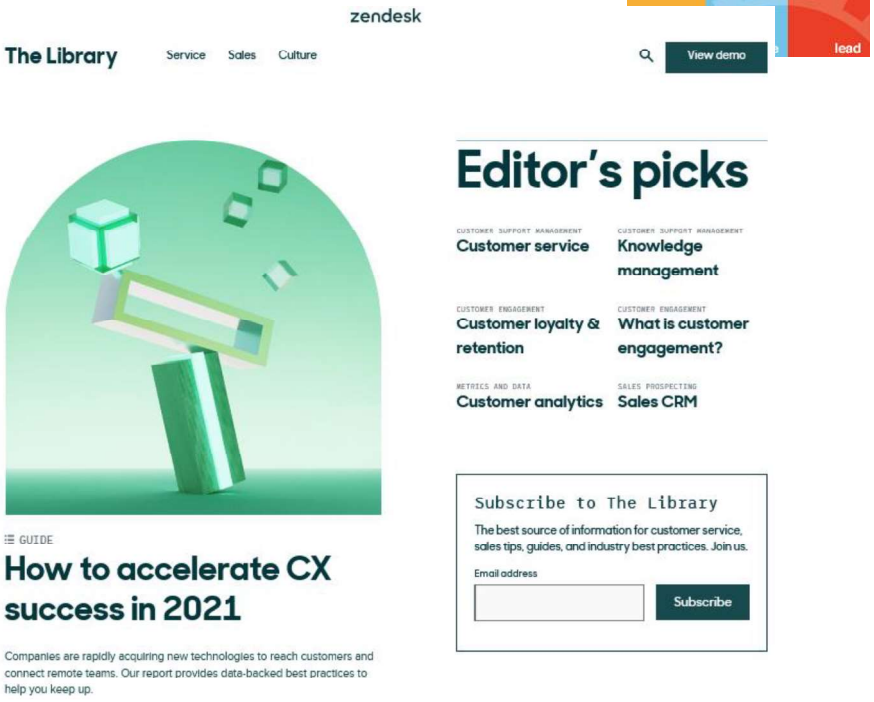
- Focuses on financial management SAAS and enterprise HR, and is a leader in the Gartner Magic Quadrant.
- In relation to their content marketing, their video marketing stands out
- After watching a video, 64% of users are more likely to buy a product online.

Zendesk

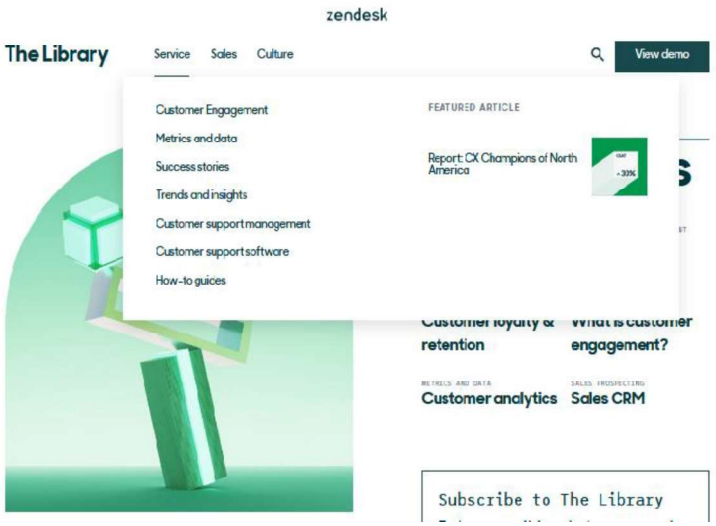
- Is a customer service platform, providing great support with self-service and proactive engagement.
- Their content focused on educating their audience about the best ways to bring business and customers closer together

Content: Zendesk





Zendesk: Content



Product marketing

- Product marketing should have a deep understanding of the customer and the market.
- Before a product launch, product marketers typically own positioning, messaging, gathering customer feedback, and the overall go-to-market strategy for a product.
- After a product launch, product marketers help with sales enablement and focus on driving demand, adoption, and the overall success of the product.

Ref: drift.com

Go-to-market strategy

- Go-to-market strategy is how a company plans to reach its customers
- It consists of:
  - Defining a target market
  - Pricing strategy
  - Choosing the distribution & marketing channel
  - Decide on support
  - Decide on promotion
  - Decide on market campaign

Case study: Tally

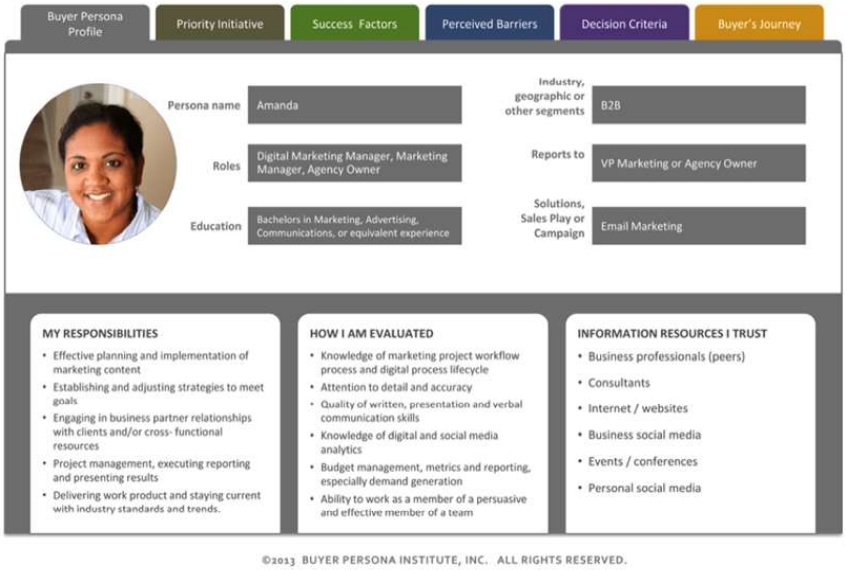
Questions:

- What key lessons can we learn about marketing from this case study?
- What else could have been done to further strengthen the marketing?

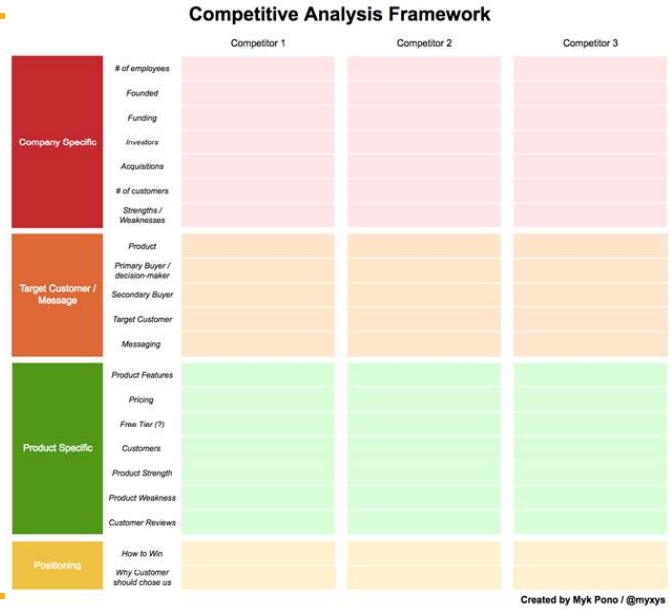
Experience sharing

Appendix

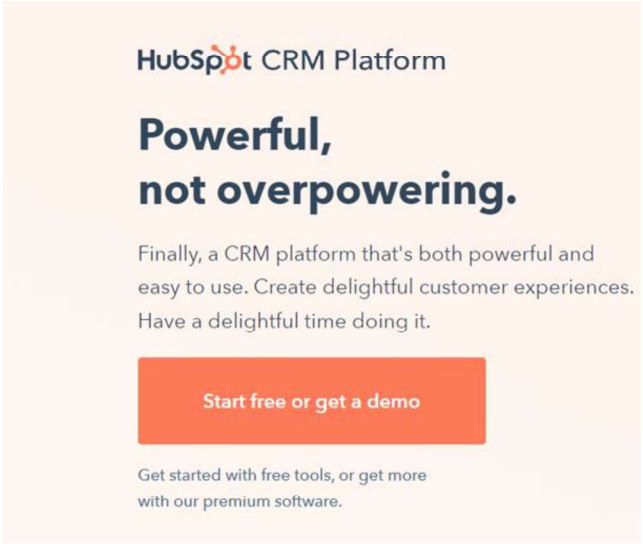
Buyer Persona



Competitor analysis



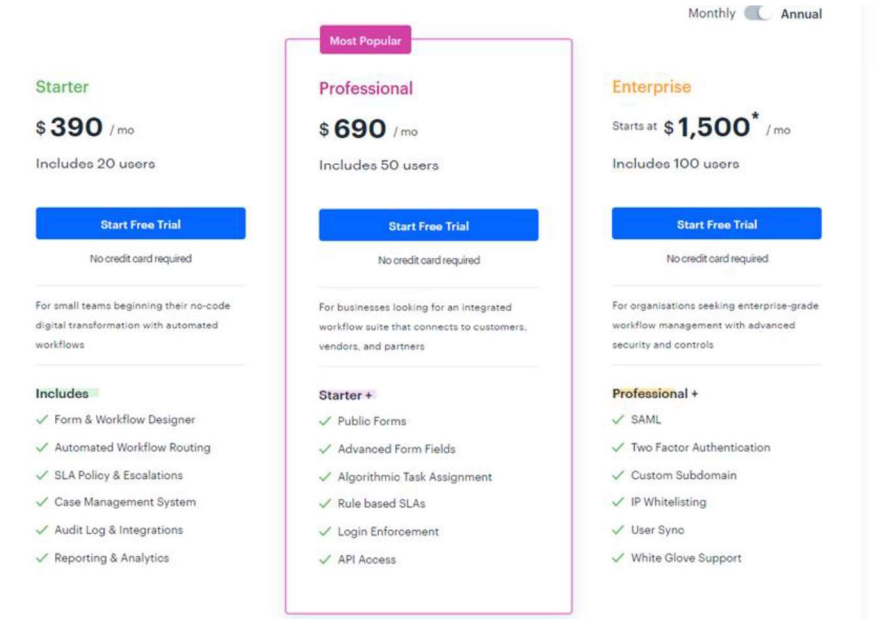
Messaging and Positioning



Go to market process

-Updates to the public website; stages announcement emails and in-platform messages; and stages internal company notifications
-MARKETING operationalizes design assets
-MARKETING creates customer-facing emails and in-product messaging
-MARKETING stages prospect-facing communication and SALES enablement document
-MARKETING considers one-off prospect email opportunities
-MARKETING considers PR opportunities — announcement or press release
-MARKETING considers organic & paid amplification opportunities

Pricing: Kissflow



Contents

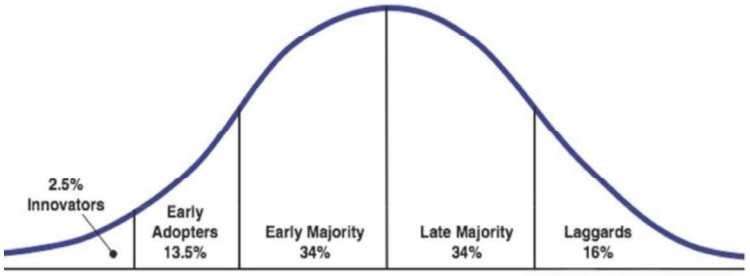
- Marketing of high tech products (Geoffrey Moore)

Product Adoption Lifecycle

- Product adoption goes through 5 stages
- The type of customers who buy the product at each stage differs

Technology adoption lifecycle

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



Innovators

- Pursue new technology and seek them out even before they are marketed.
- They are a source of great feedback.
- Example Post-It notes: The inventor just put it on desk of secretaries. Many ignored but some tried. They became Post-It enthusiasts and gave good feedback

Early adopters

- They are visionaries. They Appreciate benefits of new technology and relate to potential benefits to their concerns.
  - Example
  - John F Kennedy launching space program,
  - Henry Ford implementing assembly line.
  - They look for fundamental breakthrough for a strategic leap forward.
  - Example: Visicalc spread sheet that came before Lotus 1-2-3
    - Early adopters liked because it allowed them to do something they have never been able to do before, namely “What-if” analysis.
    - They liked because it fell in line with some common business operations like budgeting, sales forecasting, etc.
  - Example of e-Book used by 737 pilots

Early majority, Late majority & Laggards

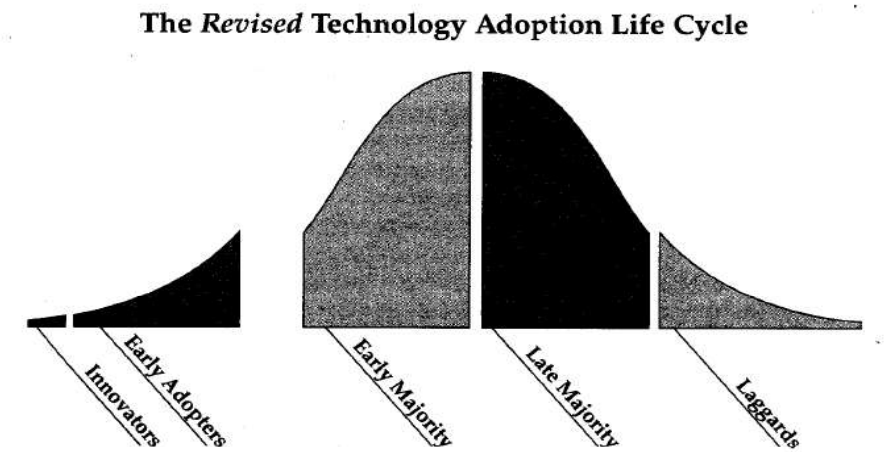
- Early majority: They care about quality, reliability, infrastructure for support. They Wait and see how other people are using the product before buying.
- Late majority: Wait till it has become a standard
- Laggards: Don't want anything to do with technology. The only time they buy it is when technology is deeply buried inside the product for example a chip embedded in the braking system of a car

Marketing High tech Products

- Each category looks at the previous group for reference. Hence we must satisfy the current group fully before we go to the next
- Marketing high tech products to each of these customer categories requires a different approach because their decision making is different. So we have to shift our marketing gear to cross the gap each time.

The chasm (the big gap)

The biggest gap is between Early adopters and Early majority



How to bridge this gap?

- Take a niche market approach.
  - Example IBM Watson. They used cognitive intelligence technology for the medical industry and within medical industry they focused on cancer. And within cancer they focused on lung cancer at at Memorial Sloan–Kettering Cancer Center. Now it is available for breast cancer, colo-rectal cancer, bladder, etc.
- Offer a whole product.
  - Example SalesForce: They did not just offer a CRM product, but they ensured that it integrates with existing IT systems of the client, the product workflows are customizable, etc.
- Be conversant with issues that dominate their business and Develop applications specific to the industry solving a critical problem
- Show up at industry specific conferences
- Get yourself mentioned in industry specific magazine articles
- Develop partnership with other vendors who serve their industry
- Earn a reputation of quality and service

Experience sharing

- What challenges have you faced / observed in marketing new technology products?

Appendix