Recent Pursuit and Implement of Disruptive Innovation

Pengcheng Wang

UNIVERSITY of HOUSTON

Introduction

Disruptive innovation is changing the world, especially in these two fields, which will change the approach in the power supply of traditional automotive technology and the impact on diagnosis and medical treatment. Conventional power supply mainly relies on oil and gas, which will produce noxious emissions that will pollute the air and even change the climate. One popular solution for this issue is to adopt renewable energy, such as using fuel cells and batteries by automotive makers. Besides, intelligent artificial technology will change the operation styles of the electronic vehicle, which will provide more safety, lower noises, and fewer expenses products for customers. In another field, finding a faster, cheaper, and more reliable approach to gene sequencing is developing fast in these recent years, and it will provide a disruptively technological method for medical treatment, especially in curing some severe diseases such as several kinds of cancers.

Main Content

- **Disruptive Innovation in Electronic Vehicle**

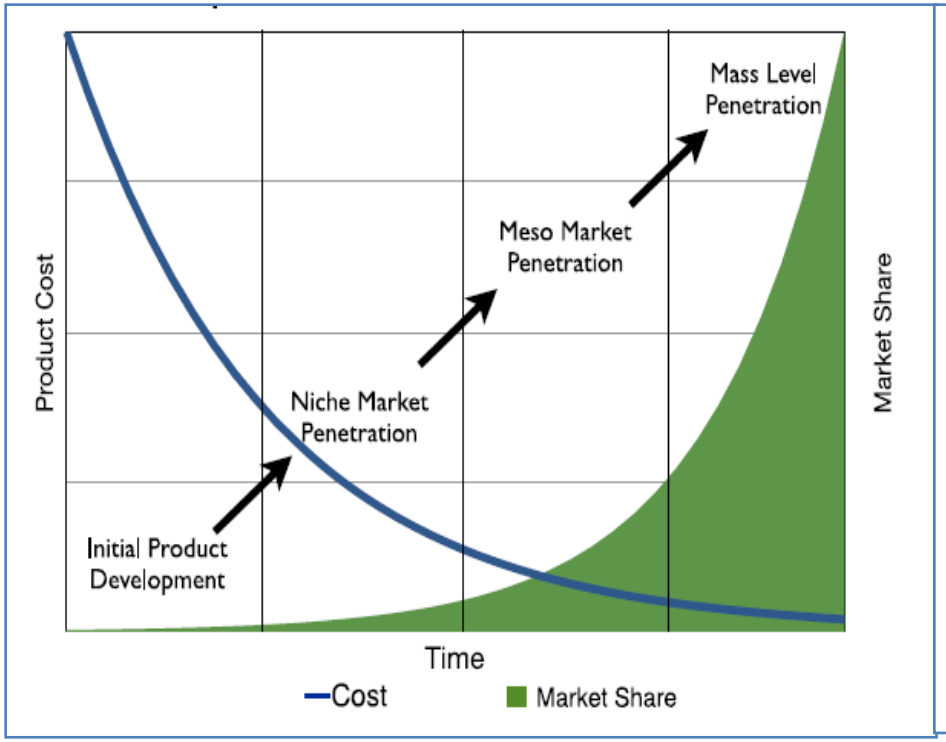


Fig. 1 The route of market introduction for new and disruptive technologies.

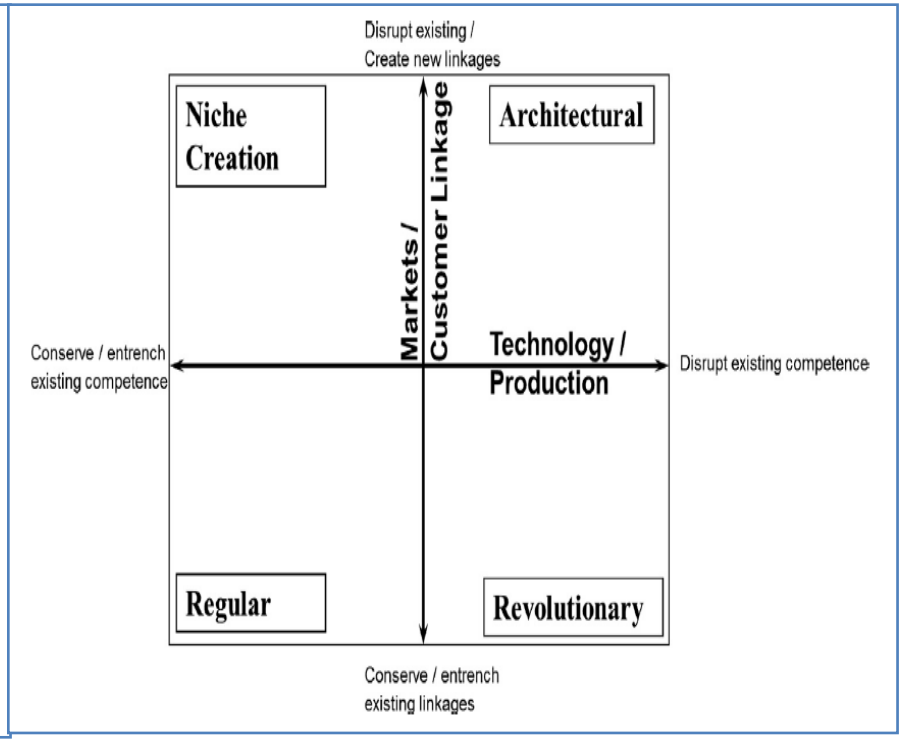


Fig. 2 Transilience map

➢ Disruptive Innovation in Gene Sequencing

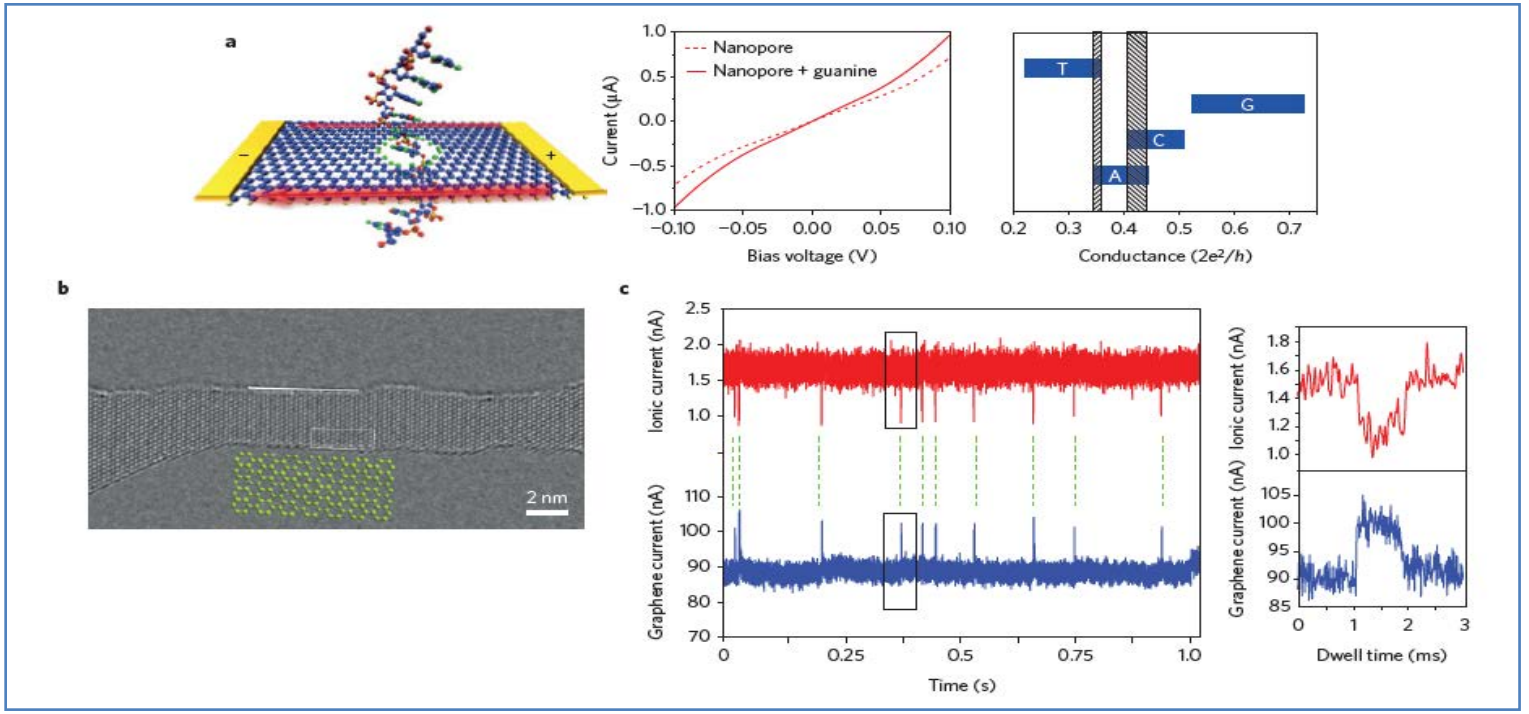
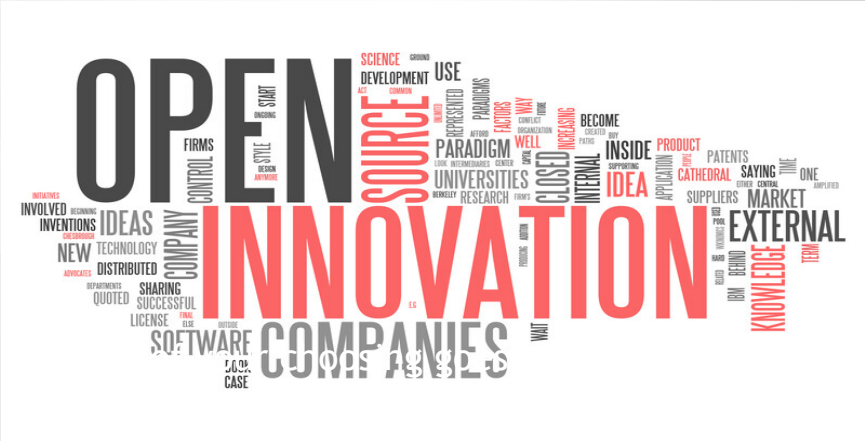


Figure 3 | Graphene nanoribbons with a nanopore for DNA sequencing. a, Left: Schematic view of a metallic zigzag graphene nanoribbon with ananopore, where current flows mostly around the zigzag edges (red arrows). Middle: A guanine DNA base in the nanopore is shown to induce a(base-specific) ~μA modulation of the edge current. Right: The four different bases yield very different current modulations. Variations in base rotation result in a spread of the conductance modulations. Shaded areas mark the regions of overlap. b, TEM image of a nanoribbon in monolayer graphene, sculpted at 300 keV at 600 ° C and imaged at 80 keV at 600 ° C. The graphene was heated to preserve the single crystallinity. The white line indicates an armchair edge. The atomic structure model of the armchair edge highlighted by the white rectangle is shown by the green dots. c, Simultaneously recorded ionic current (red) and electrical current (blue) through a ~100-nm-wide graphene nanoribbon with a 10 nm pore during translocations of double-stranded DNA (graphene source–drain voltage 20 mV). Zoomed-in views of correlated event highlighted by black rectangles are shown in panels on the right.Figures adapted with permission from: a, ref. 74, American Chemical Society; b, ref. 85, American Chemical Society; c, ref. 80, Nature Publishing Group.

Conclusion

All innovative ideas are initially met with some kind of delusion and rejection from industrial leaders and consumers, especially innovations that are candidate disruptive technologies. Only a small minority will be recognised the future potential of an innovation.

Graphene is a special material that offers unexpected opportunities. While this Review described a number of promising concrete proposals to sequence DNA with graphene nanodevices, the coming years may witness even more different approaches



Open Innovation within Large Pharmaceutical Companies

By Raymond Fernandez

UNIVERSITY of HOUSTON
CULLEN COLLEGE of ENGINEERING

Introduction

UNIVERSITY of HOUSTON
CULLEN COLLEGE of ENGINEERING

Is Open Innovation (OI) the Answer?

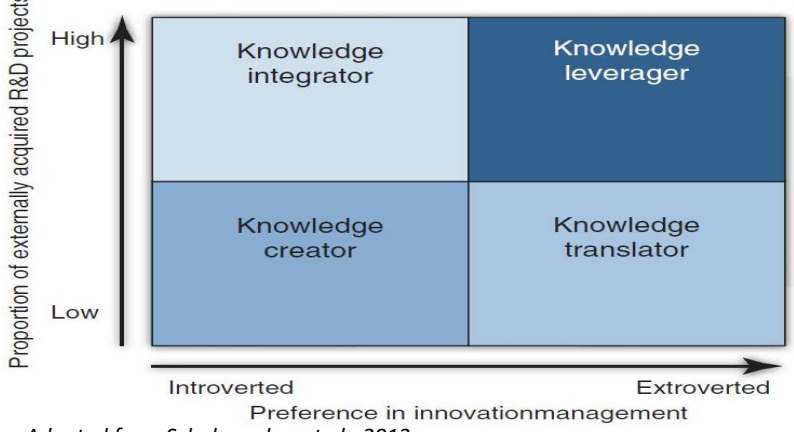
- R&D efficiency within the Pharmaceutical industry has declined over the past decades.
- The closed innovation strategy has come into question
- OI is a mode of innovation by which industries use external sources of knowledge and expertise along with external markets to accelerate internal innovation.
  - Inbound OI: acquisition of external technology, or other inputs to drive the innovation process.
  - Outbound OI: outward transfer of technology or other inputs to drive the innovation process.

Analysis

UNIVERSITY of HOUSTON
CULLEN COLLEGE of ENGINEERING

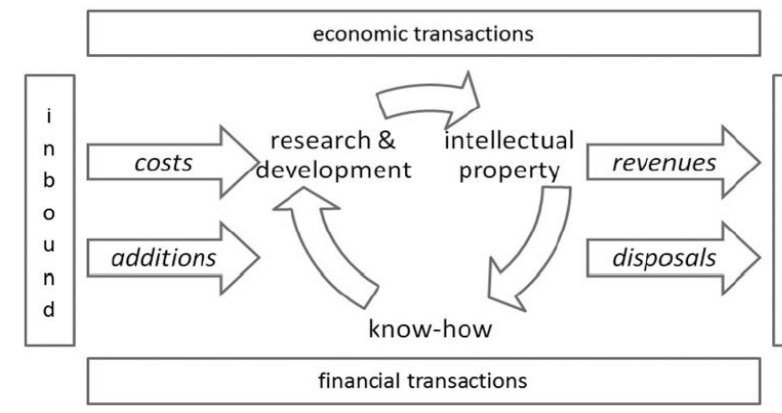
Measuring the degree of openness

- IO Models: Company preference for innovation management vs the proportion of externally acquired innovation.



Adapted from Schuhmacher et al., 2013

- Financial accounting methodology: Outbound vs. inbound processes; economic vs. financial nature of business transactions.



Adapted from Michelino et al. 2015

Analysis

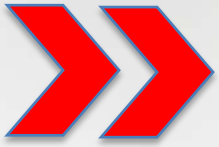
UNIVERSITY of HOUSTON
CULLEN COLLEGE of ENGINEERING

Implementation: Inbound Collaborations

Most common form of OI.

Benefits

- Implemented to bridge the knowledge/skill gap.
- Associated with significant innovation and financial performance.



Disruption

- Participation when rivalry is not increased.
- IP value chains are preserved.

Conclusion

UNIVERSITY of HOUSTON
CULLEN COLLEGE of ENGINEERING

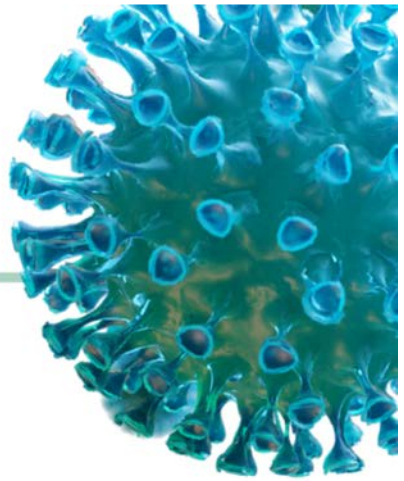
OI a promising research area

- Relatively new area of research
- Collaboration is the future of innovation
- Pfizer Biontech collaborative is solid evidence.

Covid-19 vaccine brought to you by:

Pfizer

BIONTECH



Open Innovation!!!

TECHNOLOGY DIFFUSION AND INNOVATION

RAFAEL MOSQUEDA

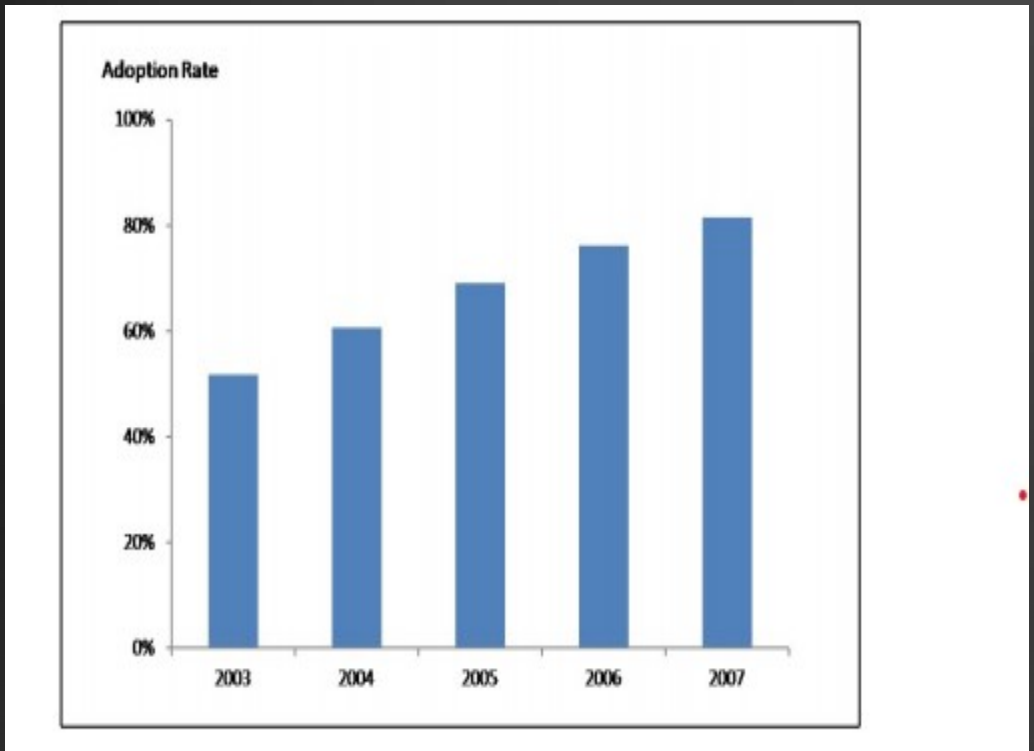
INTRODUCTION

- Technology Diffusion and Innovation is the process of how new idea or products are adopted by the consumer or the market
- When a new product comes out it takes some time for the product to become successful and capture the masses.
- The process always starts out with a low amount of individuals who want to try something new and if it works, they present the idea to other people and get more people on board.
- Many factors can contribute to when a consumer will take in the product.

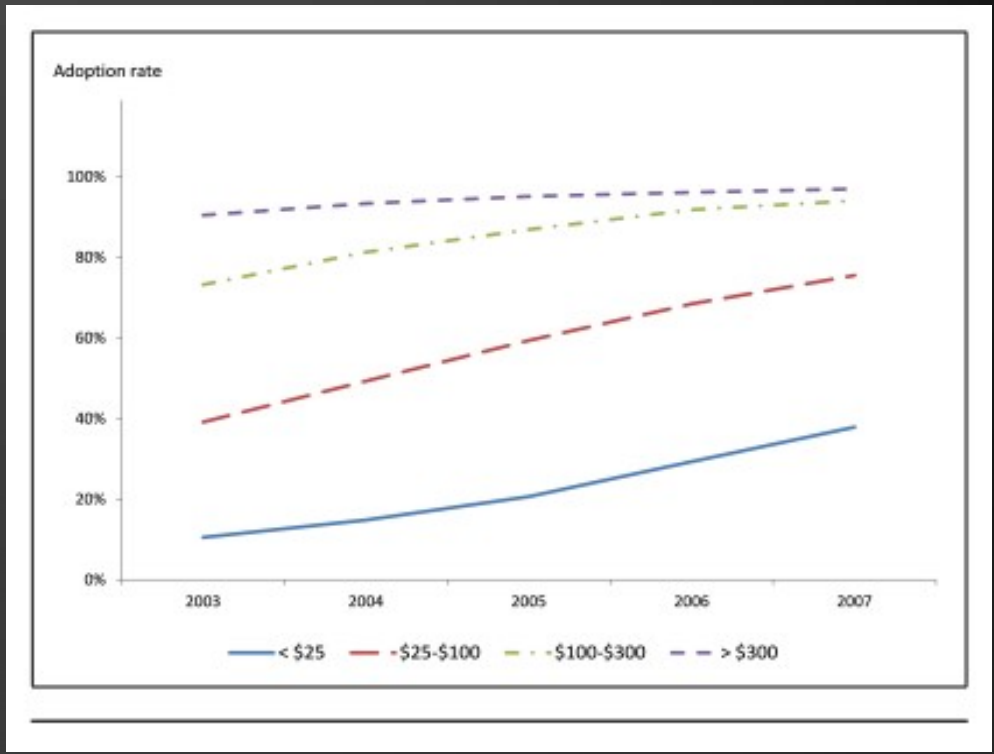
GRAPH OF ADOPTERS

This graph shows how consumers generally take in new products.

EX: INTERNET BANKING



Internet Banking Diffusion



Internet Banking Diffusion on bank size

SUMMARY/REFERENCES

- A new product will always start out with a small group who will accept it and if it lives up to or exceed expectations then everyone else will follow.
- Depending on the resources a consumer has like money or size of their business can also affect when they will try new products.

- Sullivan, Richard, and Zhu Wang. "Technology Diffusion: The Case of Internet Banking." Economic Quarterly (10697225), 2020 1st Quarter 2020, pp. 19–40. EBSCOhost, search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=142759301&site=ehost-live.

Challenges in Innovation Process

Steffano Sanchez
November 23rd, 2020
MECE 5397- Engineering Innovation & Entrepreneurship

- Introduction
- Challenges
- Solutions
- Concluding Remarks

Overview & Motivation

"For good ideas and true innovation, you need human interaction, conflict, argument, debate."

- Margaret Heffernan

Problem

- Individuals stuck in their daily jobs lack motivation and empowerment.
- Innovation is encouraged through motivation and empowerment.
- Higher ups provide motivation and empowerment, but sometimes higher ups barely have enough motivation and empowerment themselves.

Solutions

- Provide incentives
  - Competitions
  - Rewards
  - Dedicated time for thinking
  - Don’t focus solely on the bottom line.
- Provide a work place where your employees want to spend time at.

- The innovation process is an inherently gradual process that is often not identified. When a company or an individual is “innovating” they don’t realize it.
- Innovation is encouraged through motivation and empowerment.
- There are many ways to encourage innovation, motivation, and empowerment.

Conclusion

“ Being positive won’t guarantee you will succeed but being negative will guarantee you wont.”

- Jon Gordon

Types of Innovations in Major Modern Tech Companies

BY: SAIF MARADIA

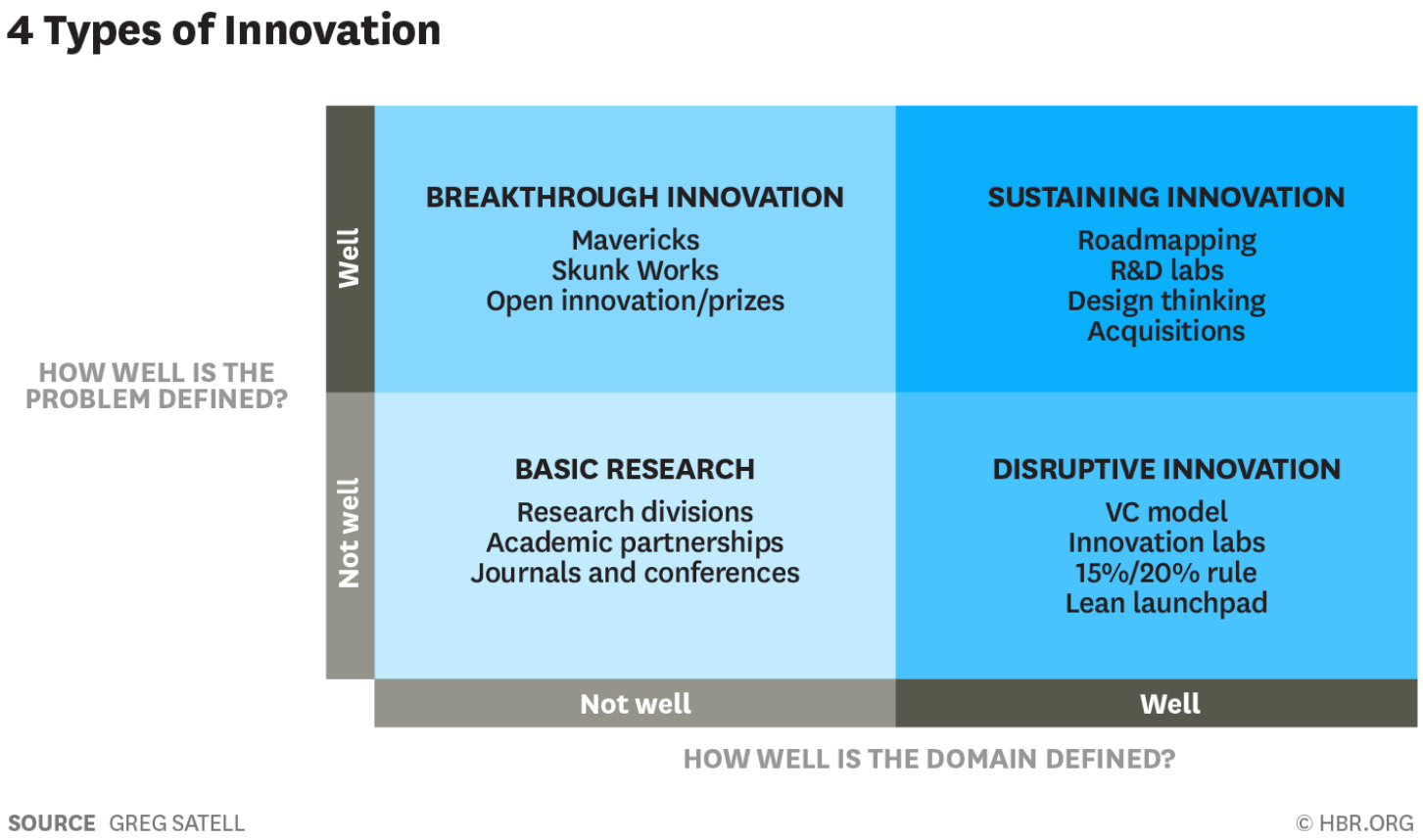
MECE 5397

Introduction

- Innovation
  - A new idea, method, or device and is necessary for a long-term company
  - An improvement to something that already exists
- Major Modern Tech Companies
  - Apple
  - Google
  - Microsoft
  - Tesla
- These major modern tech companies utilize the 4 types of innovation to lead them to long-term success

Innovation Matrix

- Breakthrough Innovation
  - Old problem solved in a new way to create a new market
- Sustaining Innovation
  - Old problem improved in increments in a well-defined market
- Basic Research
  - New problem aiming to create a new market
- Disruptive Innovation
  - New solution to a well-defined market



Examples of Innovation

Sustaining Innovation

- Apple has utilized sustaining innovation by creating a yearly refresh cycle for all their products to keep them fresh and innovative.

Breakthrough Innovation

- Tesla has had a breakthrough innovation with their electric cars. This is an old problem solved in a new way and now has created an electric car segment.

Basic Research

- Microsoft has utilized basic research to create skype translator and cortona by researching speech, natural language processing, and machine learning.

Disruptive Innovation

- Google's chromebook is an example of a disruptive innovation. It attempts to create a low budget laptop compeitior in a well-defined market.

Sustaining Innovation

Breakthrough Innovation

Basic Research

skype™ translator

Disruptive Innovation

Conclusion

- Innovation is a new idea, improvement, method, or device and is necessary for a long-term company.
- The four main types of Innovation are:
  - Sustaining Innovation
  - Breakthrough Innovation
  - Basic Research
  - Disruptive Innovation
- All major modern tech companies such as Apple, Tesla, Microsoft, and Google have used a combination of these innovations for continued success and growth.

University of Houston MECE 5397: Engineering Innovation and Entrepreneurship

DISRUPTIVE INNOVATION HAS CHANGED THE WORLD - ARE WE BETTER OFF WITH OR WITHOUT IT?

BY: SHUVA ADHIKARI

INTRODUCTION AND OVERVIEW

Introduction

Disruptive innovations have revolutionized the way complex problems and challenges are addressed.

Motivation

This research aims to understand how these types of innovations effect products preexisting in the industry, and the overall effect of declining businesses on the economy.

Basics

Disruptive is thought to be overall beneficial, as it often solves problems in a cost-effective way. However, it is worth noting that the increased autonomy from such inventions may negatively affect other businesses, in such a way that there can be an overall net loos.

Overview

- Identify disruptive innovations that have immensely impacted the market and consumerism
- Analyze these innovation's impact on previously existing items in the markets
- Determine the cost trade off-of declining and booming industries
- Summarize findings

DISRUPTIVE INNOVATION EXAMPLES

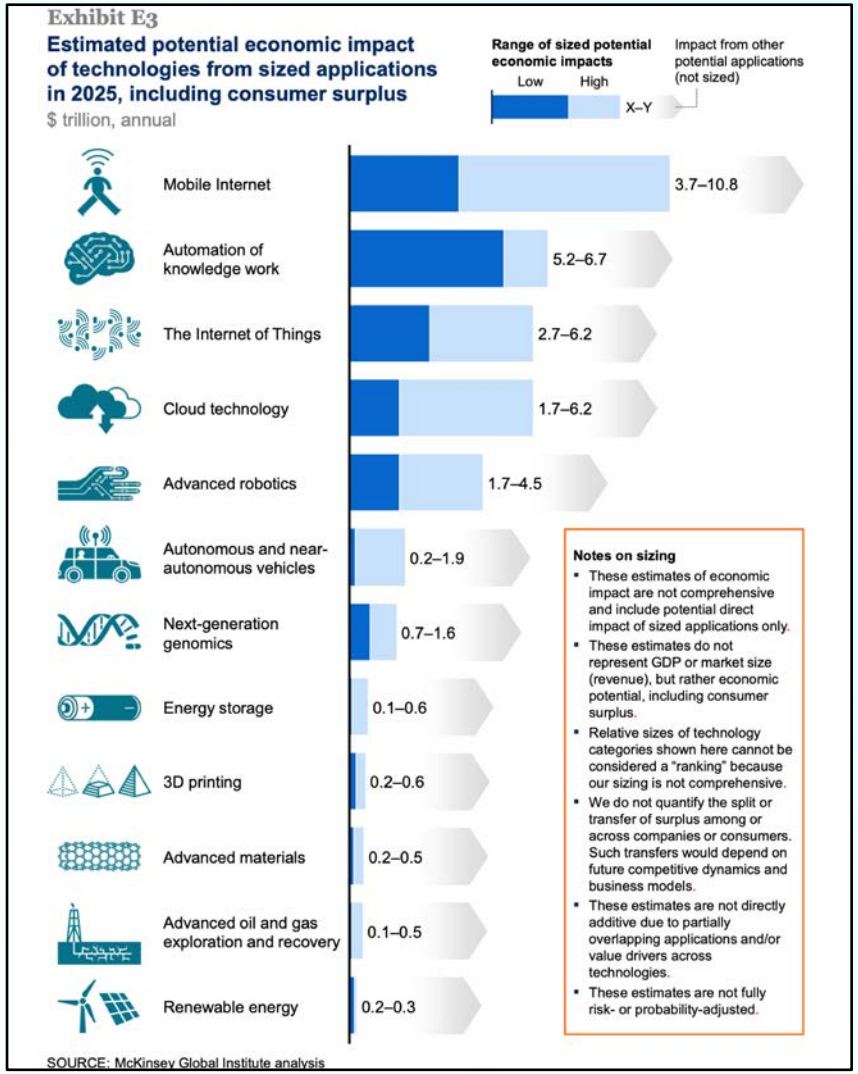
Netflix replaced Blockbuster and Cable TV

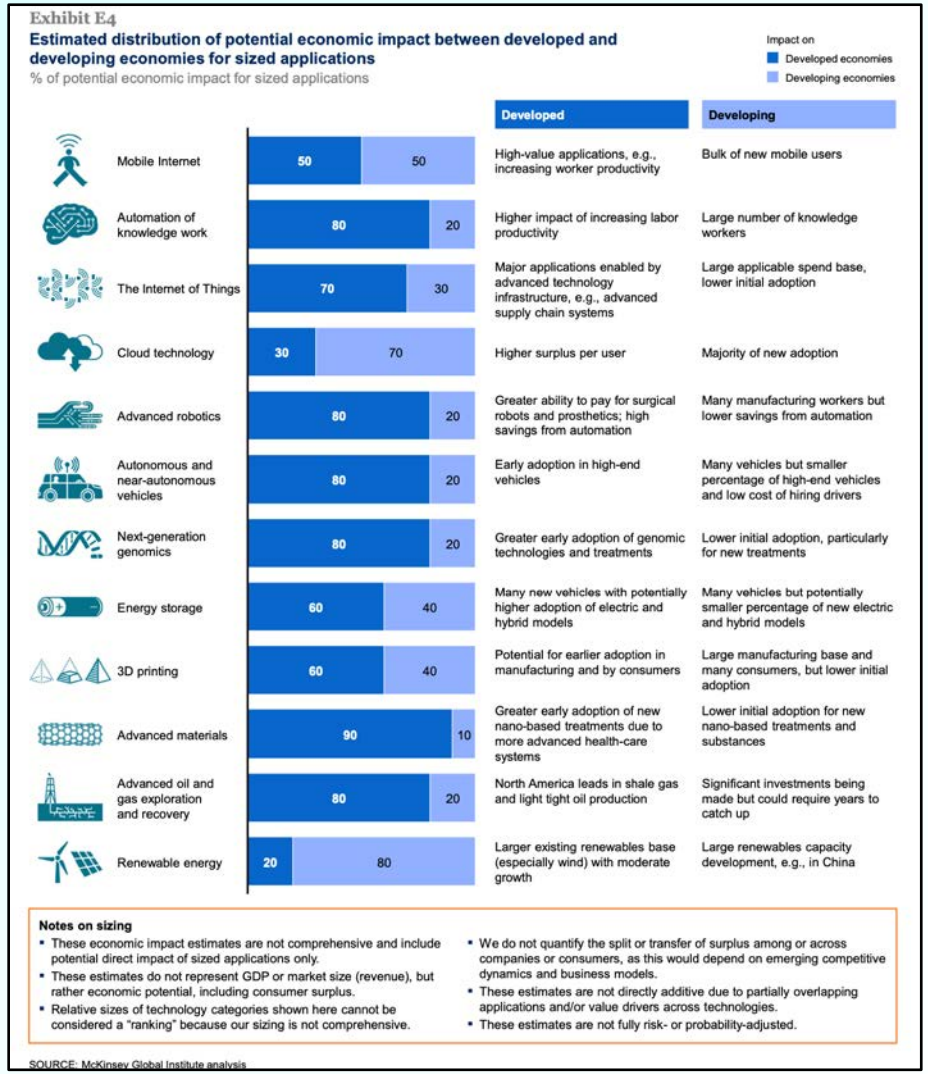
Bitcoin is replacing payment methods

Airbnb is replacing hotels and motels

Next-level genomics will replace many outdated medical practices

ECONIMIC IMPACT





https://www.mckinsey.com/~/media/McKinsey/Business%20Functions/McKinsey%20Digital/Our%20Insights/Disruptive%20technologies/MGI_Disruptive_technologies_Executive_summary_May2013.pdf

SUMMARY AND CONCLUSION

MANY BUISNESSES ARE NEGATIVELY AFFECTED BY DISTRUCTIVE INNOVATION

STUDIES HAVE SHOWN THAT NEW JOBS AND INNOVATIONS COUNTERACT THE DECLINE OF PREEXISTING BUSINESSES

DISTRUCTIVE INNOVATIONS ALLOW FOR NEW IDEAS AND INNOVATIONS TO GROW

THE IS A BOOMING PROGRESSION OF NEW INNOVATION COMING AFTER OLDER ONES BECOME ESTABLISHED.

THESE TYPES OF INNOVATION DRIVE DOWN THE COST OF GOOD, WHICH INCREASES CONSUMERISM

OVERALL DISRUCTIVE INNOVATIONS, EVEN ON A GLOBAL LEVEL, ARE BENEFICIAL FOR THE ECONOMY

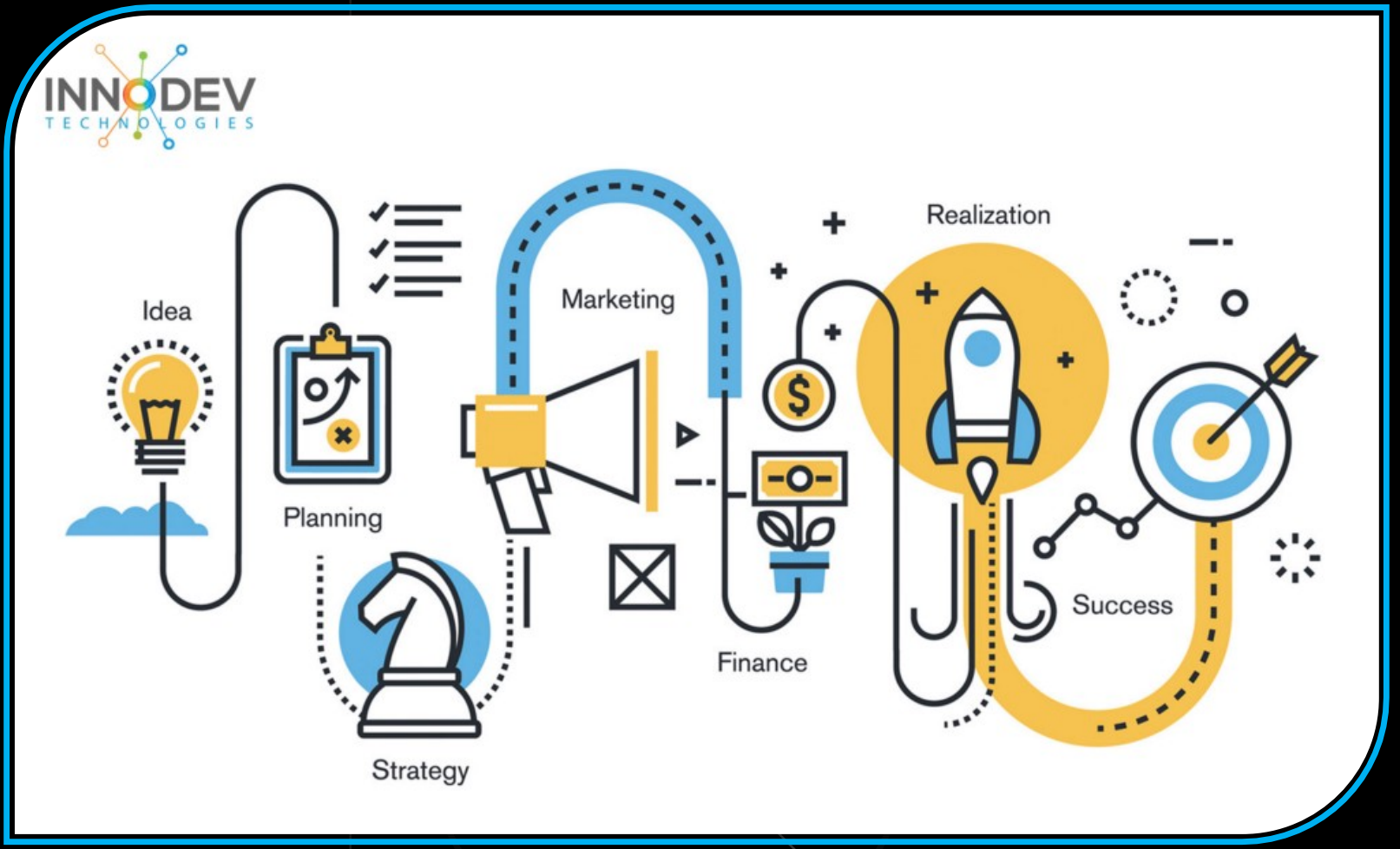
FINDING THE CHALLENGES TO A SUCCESSFUL STARTUP

BY: SAAD KHAN

INTRODUCTION

Contoso

NEWLY BUILT STARTUPS SHOULD HAVE AN ADVANCE STRUCTURAL ECONOMIC CHANGE AND PROMOTE INNOVATION. THESE TWO STRATEGIES ARE IMPORTANT IN TODAYS DAY AN AGE TO ADAPT TO SITUATIONS LIKE COVID-19 WHICH HAS IMPACTED A LOT OF STARTUPS. THIS PANDEMIC HAS FORCED SMALL BUSINESSES TO RETHINK STRATEGIES AND FEELING THE IMPACT OF THE ECONOMIC UNCERTAINTIES.

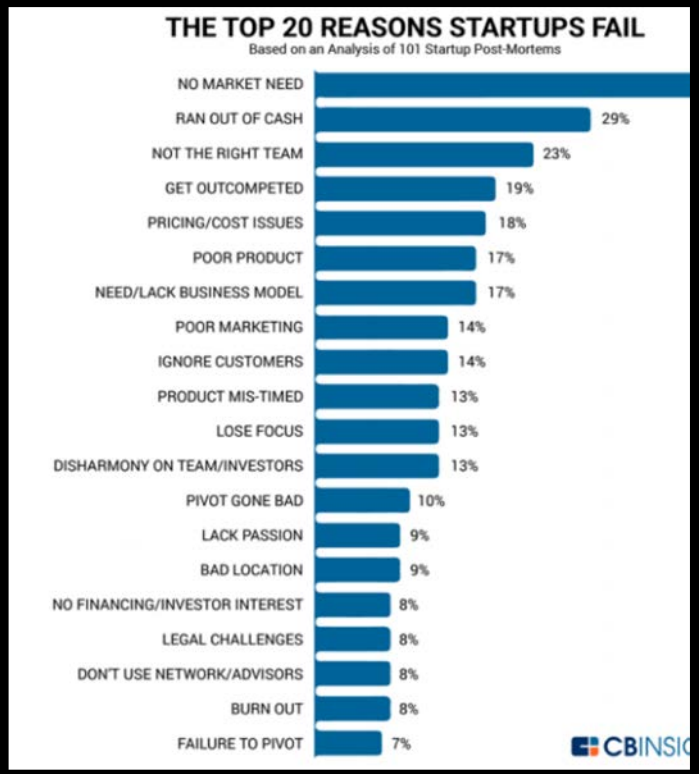


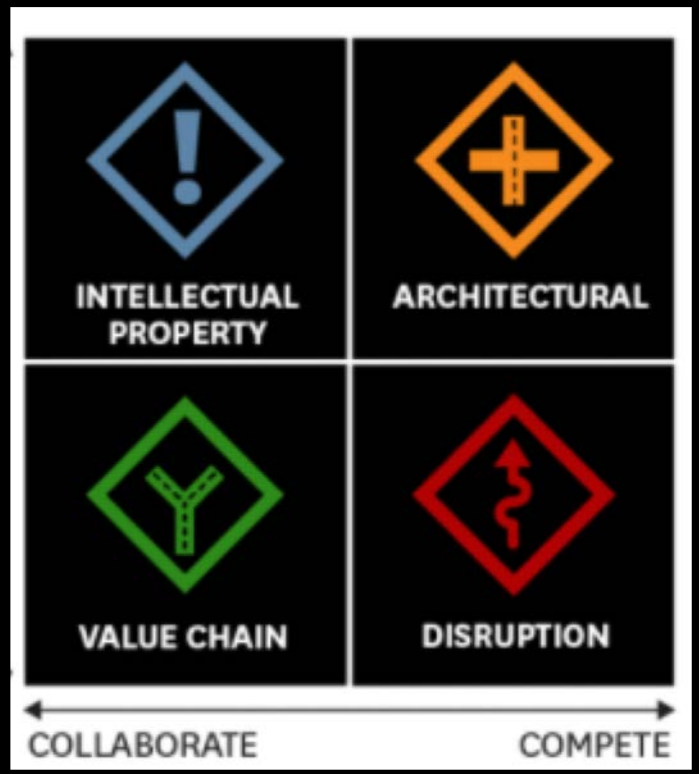
Challenges Facing Startup During Covid-19

The financial climate of the entire world has been dramatically changed due to the lockdown of the Covid-19 pandemic.

Having The Right Strategy for Startups

Failure Reasons → Strategy Selection Process → Execution Plan





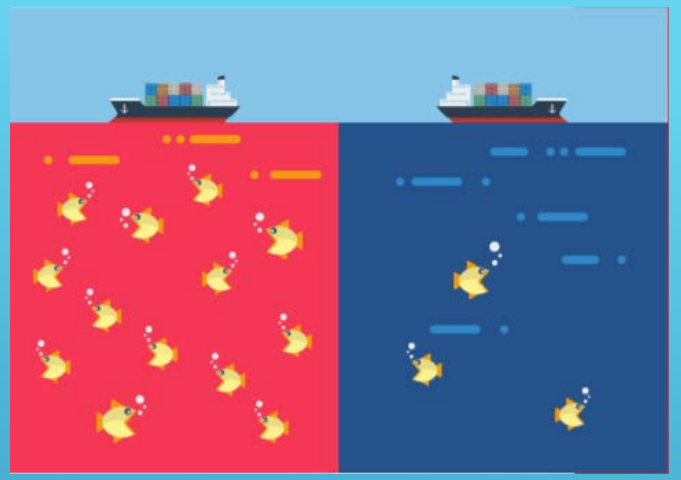
CONCLUSION

One of the first task a young startup company is finding funding "raising a substantial amount of money" to help develop the product. If the proper funding is not found most likely the business will fail in its first term. Denise Lee an author on Forbes wrote the number reason why start up fails was "no market need" meaning that there was no demand/ customer in the market. Start up fail when they are not trying to solve a problem. Having the right strategy is crucial for a successful business to prosper in a very altering market.

Stacey Hignight

INTRO

- Blue Ocean Strategy is based on doing business in unexplored markets, instead of already existing competitive markets
- The current markets are the already "bloodied" red oceans by the competition, making the newer markets the blue oceans
- Accomplished by focusing implementing "value innovation

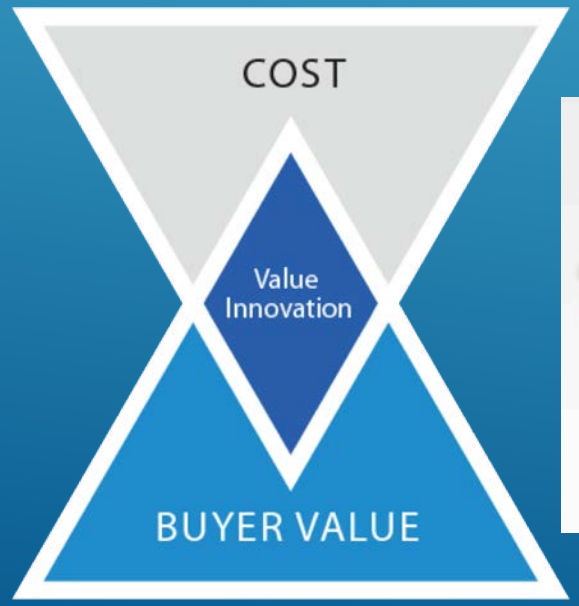


- The main benefits are:
  - defining the boundaries on your own market
  - Having a temporary monopoly over the market until the competition comes in
- Many strategies exist for finding/creating blue ocean markets

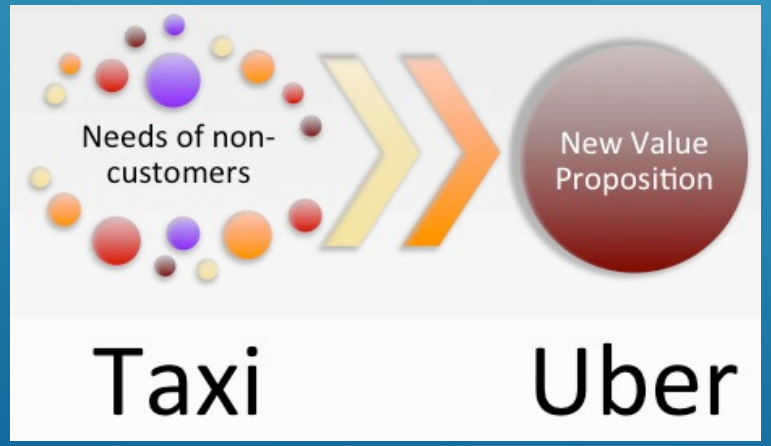
Motivation: Chose this topic due to the abundance of available information and usefulness to understanding business in the future.

FOCUSING ON THE CONSUMER

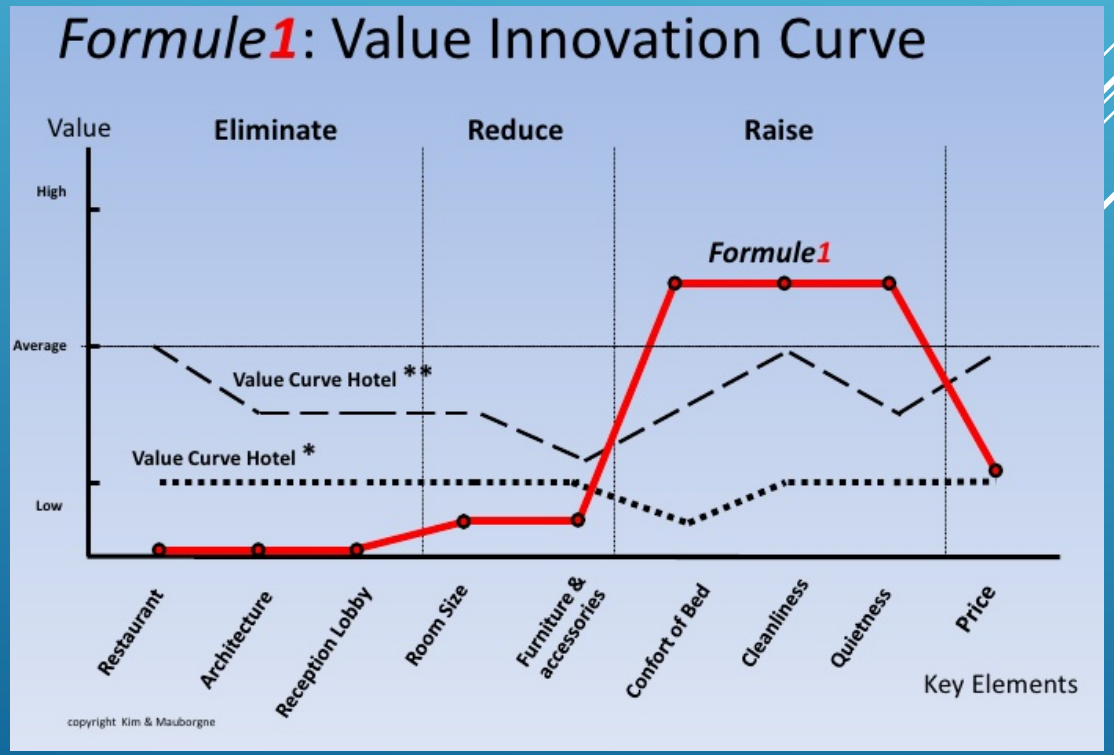
Value innovation means creating a leap in value for consumers by lowering cost while increasing buyer value.



Example

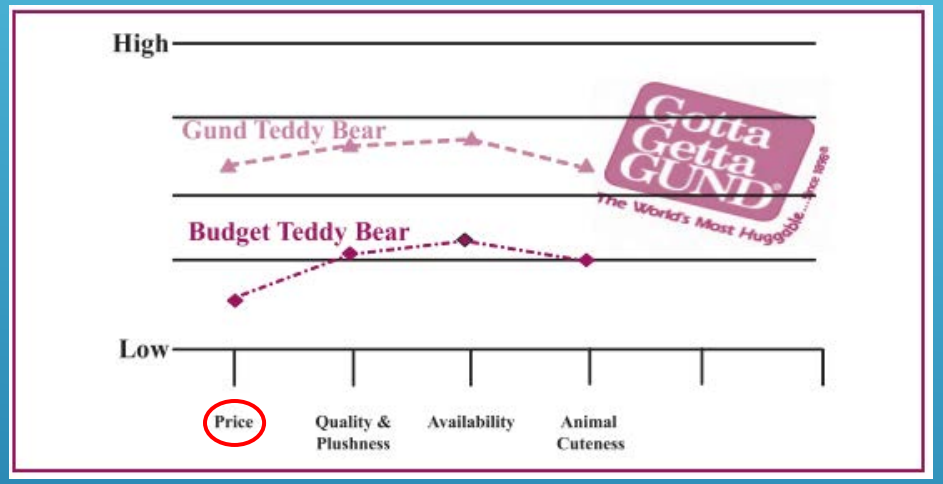


Focus on what adds value to consumer and minimize costs by trimming the rest.

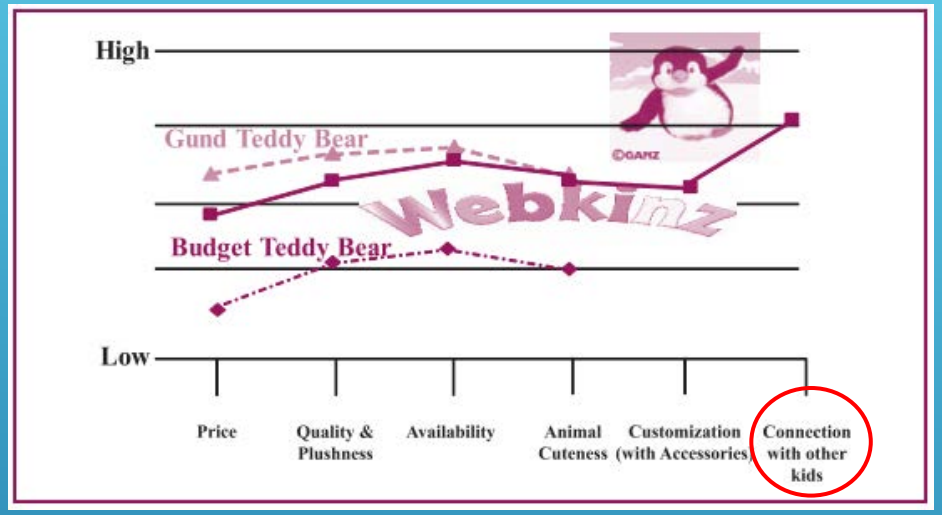


DISCOVERING BLUE OCEANS (Plush Toy Market Example)

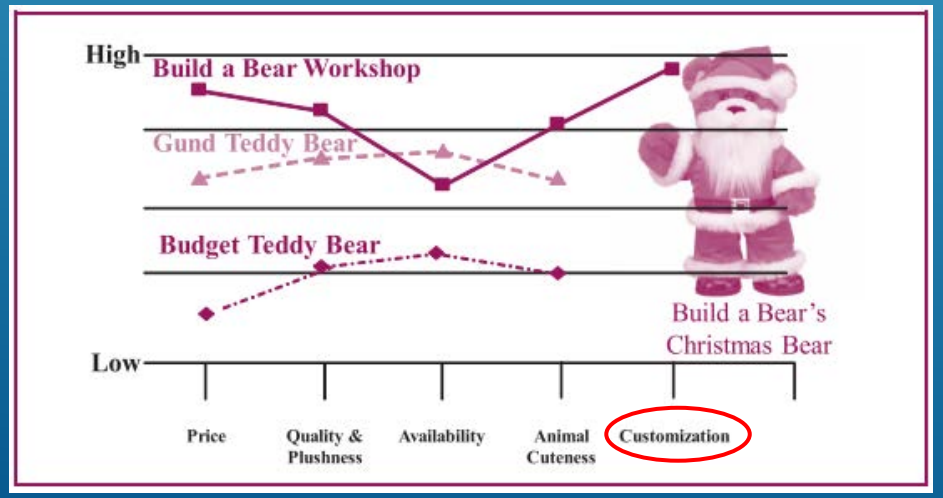
Industrial Efficiency Logic – high volume low cost



Network Services Logic – more members, more value

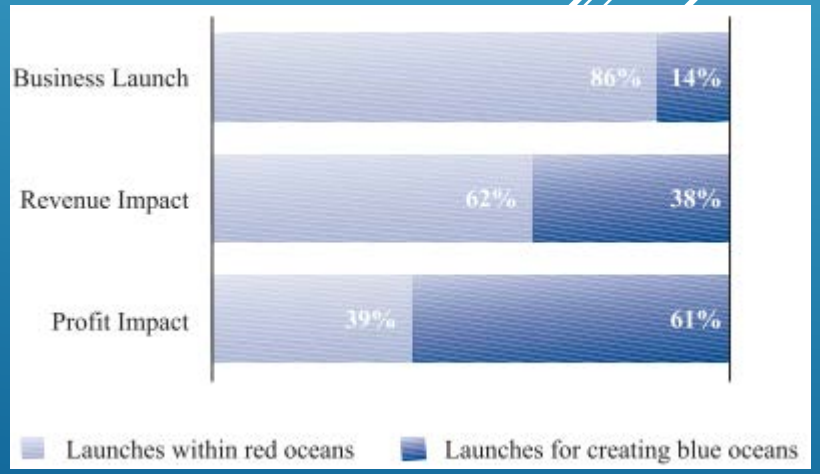


Knowledge Intensive Logic – tailor offerings



Higher proportion of profits and revenues for blue ocean launched businesses

Results



CONCLUSION

- Blue ocean strategy increases profit margins by moving away from competition
- Blue ocean markets are created by focusing on value to the consumer
- These markets can be discovered using various logics and strategies

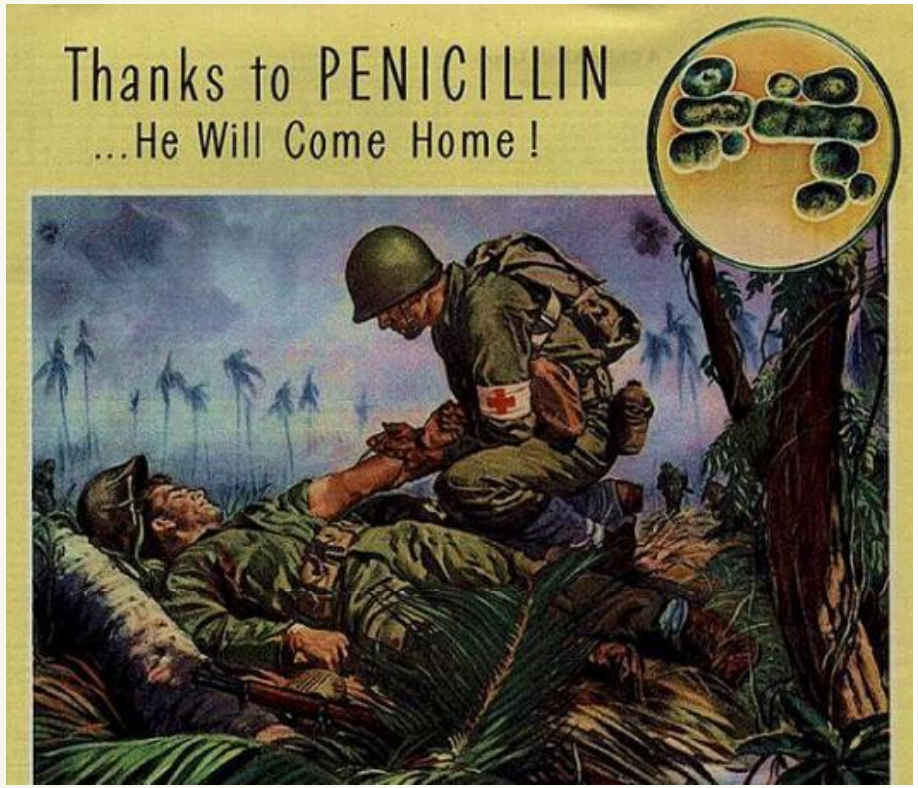
Technological and Scientific Innovations Surrounding World War II

Shadman Chowdhury

Introduction

- Descriptive research meant to understand the characteristics of historic innovations surrounding World War II
  - Medical applications
  - Military applications
  - Postwar effects
- Technological and scientific innovations led to many wartime as well as postwar advances in various fields

Medical



Penicillin saved many lives and served as the basis for future antibiotics.

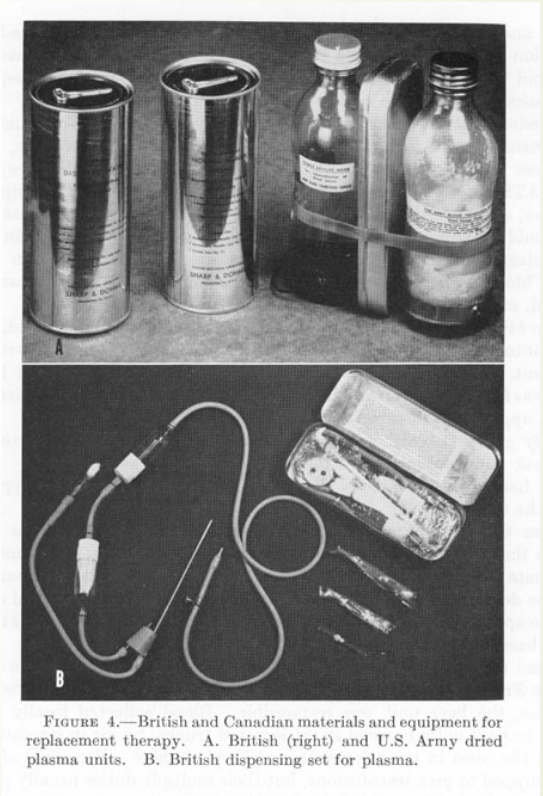
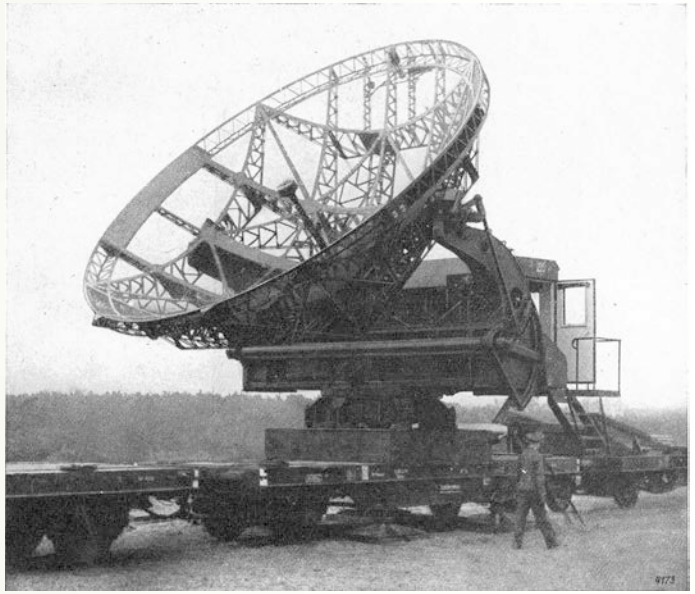


FIGURE 4.—British and Canadian materials and equipment for replacement therapy. A. British (right) and U.S. Army dried plasma units. B. British dispensing set for plasma.

Liquid plasma replaced whole blood in blood transfusions.

Military



Radar technology allowed for defensive artillery detection and improved targeting capabilities.

Atomic weaponry paved the way for a new, destructive age in warfare, its nuclear payload capable of wiping out thousands of lives in an instant.

Conclusion

- Medical innovations ranged from penicillin to atabrine and liquid plasma
  - Penicillin was an accidental discovery for an effective antibiotic and even led to DDT
  - Atabrine and liquid plasma were used for malaria and blood transfusions, respectively
- Military innovations ranged from radar technology and bombsights to atomic bombs
  - Radar and bombsights provided optical and non-optical means to detect and track targets
  - Atomic bomb had the immediate destructive effects showcased in Hiroshima and Nagasaki and it had the ripple effects of a nuclear arms race as well as deterrence

UNIVERSITY of HOUSTON
CULLEN COLLEGE of ENGINEERING

Pathways to a Successful Startup

ShayQuan Grant
MECE 5397: Engineering Innovation and Entrepreneurship
Due: 23 November 2020
Submitted: 21 November 2020

Introduction

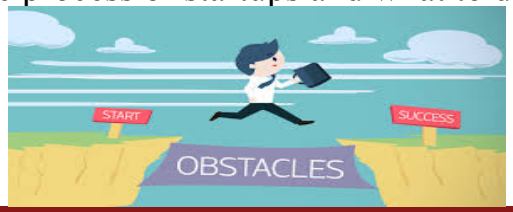
Motivation: Money is a big factor that motivates most entrepreneurs. People wouldn't be in business if money didn't motivate them to some degree. Five other common motivators are as followed:

- Freedom
- Adventure
- Impact
- Security
- Relevance

Basics: A startup is a young company founded by one or more entrepreneurs to develop a unique product or service and bring it to market. This product must be believed to have a demand.

Overview: This presentation will aim to examine the following:

- Plan/ route of execution to have successful startups
- Difficulties that may arise in the process of startups and what to do when hit with those obstacles



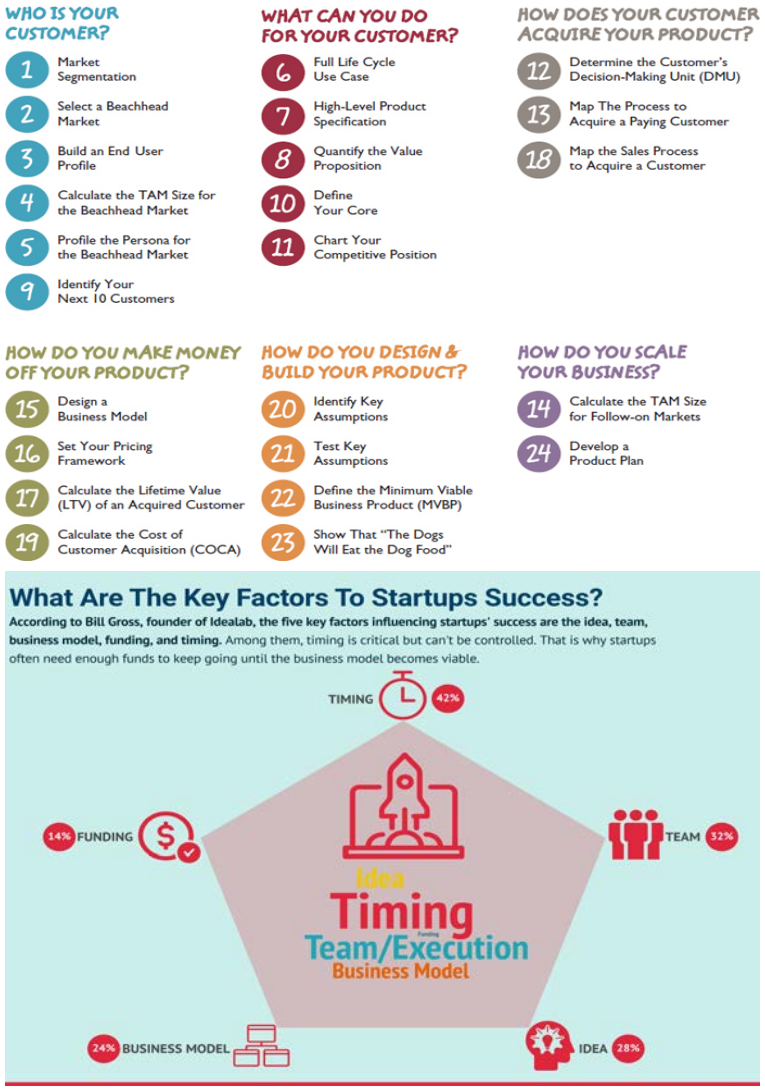
Route to Success

Examples of successful sneaker reselling company startups:

- Flight Club
- Trusted Kicks
- Modern Hype Houston
- GOAT
- StockX

These companies had good timing and funding along with strategies/ideas that were executed by an experienced team who refused to accept failure.

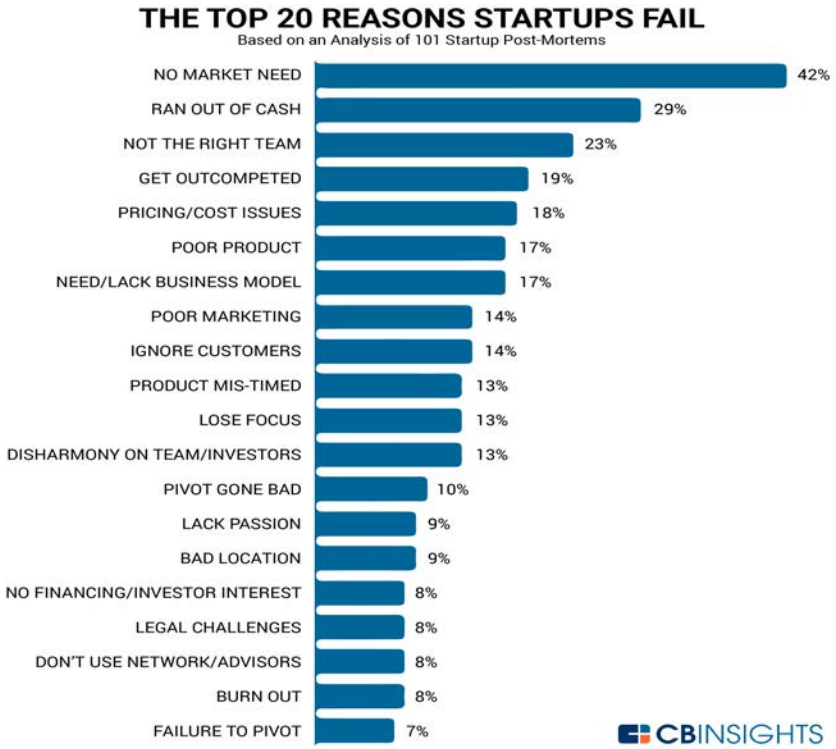
Six stage route of successful startups: (1) Concept and Research, (2) Commitment, (3) Traction, (4) Refinement, (5) Scaling, (6) Becoming Established.



Obstacles

(1) Quitting your day job at the right time, (2) Dealing with a new lifestyle pattern, (3) Financial challenges, and (4) Hiring perfect team.

Overcome obstacles by being patient before quitting your day job, understanding that you'll deal with a whole new type of fatigue and financial issues, and making sure that the team you hire is inspired by success and not just money.

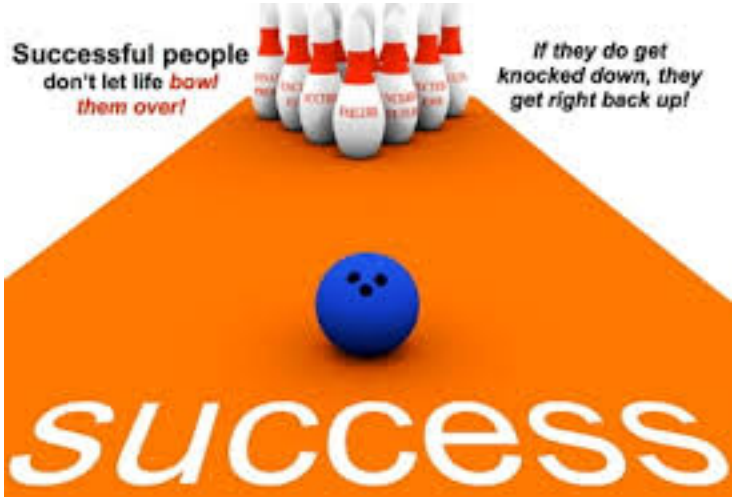


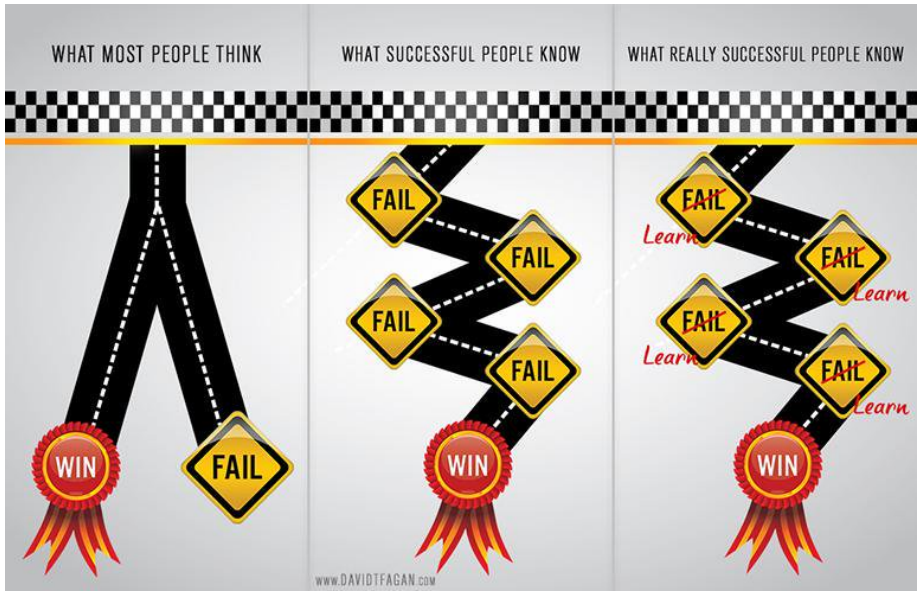
In 2019, the failure rate of startups was around 90%. Research concludes 21.5% of them fail in the first year, 30% in the second year, 50% in the fifth year, and 70% in their tenth year.

To avoid failure: (1) Set goals, (2) Accurately research, (3) Love the work, and (4) Don't quit.

Conclusion/ Summary

- ✓ Introduced what startups are and provided background information on the topic
- ✓ Motivation to create startups
- ✓ Route to success of startups including the stages and steps that they go through
- ✓ Obstacles and how to get over them without quitting
- ✓ Failures and how to combat them





References

[1] Prevost, Shelley. “5 Best Reasons to Start a Business This Year.” *Inc.com*, Inc., 7 Jan. 2014, www.inc.com/shelley-prevost/whats-really-motivating-your-work.html.

[2] Deeb, George. “For A Successful Startup, You Need Strategy And Execution.” *Forbes*, Forbes Magazine, 7 Jan. 2016, www.forbes.com/sites/georgedeeb/2016/01/07/startup-success-equals-strategy-and-execution-you-need-both/?sh=6a85ceab44c3.

[3] Segal, Chelsea, and Chelsea SegalChelsea Segal is the CEO of Targetwise. TARGETWISE empowers agencies. “Chelsea Segal.” *Cox BLUE*, www.coxblue.com/the-6-stages-of-a-startup-where-are-you/.

[4] Published, et al. “The Five Key Factors That Lead To Successful Tech Startups.” *FourWeekMBA*, 19 Nov. 2019, fourweekmba.com/startup-success-factors/.

[5] “Disciplined Entrepreneurship: 24 Steps to a Successful Startup.” *O'Reilly Online Learning*, Wiley, www.oreilly.com/library/view/disciplined-entrepreneurship-24/9781118692288/08_p01.html.

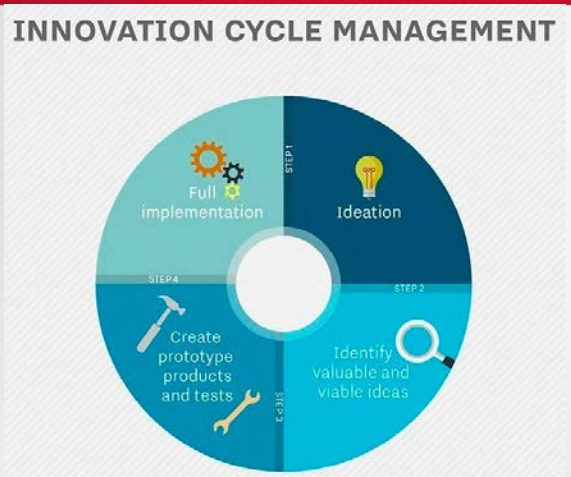
[6] Rey, Jason Del. “Flight Club - the Retail Mecca for Sneakerheads - Is Merging with the GOAT Sneaker App.” *Vox*, Vox, 8 Feb. 2018, www.vox.com/2018/2/8/16987008/flight-club-goat-merger-acquisition-sneakers.

[7] Green, Dennis. “A Company That Bills Itself as a Stock Market for Sneakers Is Worth $1 Billion. Now It Wants to Abolish Fixed Prices for Collectibles Altogether.” *Business Insider*, Business Insider, 30 July 2019, www.businessinsider.com/stockx-builds-database-for-sneakerheads-and-plans-for-more-2019-7.

[8] Bryant, Sean. “How Many Startups Fail and Why?” *Investopedia*, Investopedia, 9 Nov. 2020, www.investopedia.com/articles/personal-finance/040915/how-many-startups-fail-and-why.asp.

[9] Writer, Staff. “Common Obstacles You'll Face When You Start a New Business.” *Small Business Rainmaker*, www.smallbusinessrainmaker.com/small-business-marketing-blog/common-obstacles-youll-face-when-you-start-a-new-business.

MECE 5397/6397 MICROFABRICATION AND FLEXIBLE ELECTRONICS GROUP PROJECT



CHALLENGES FACED BY APPLE INC. FOR NEW INNOVATIONS

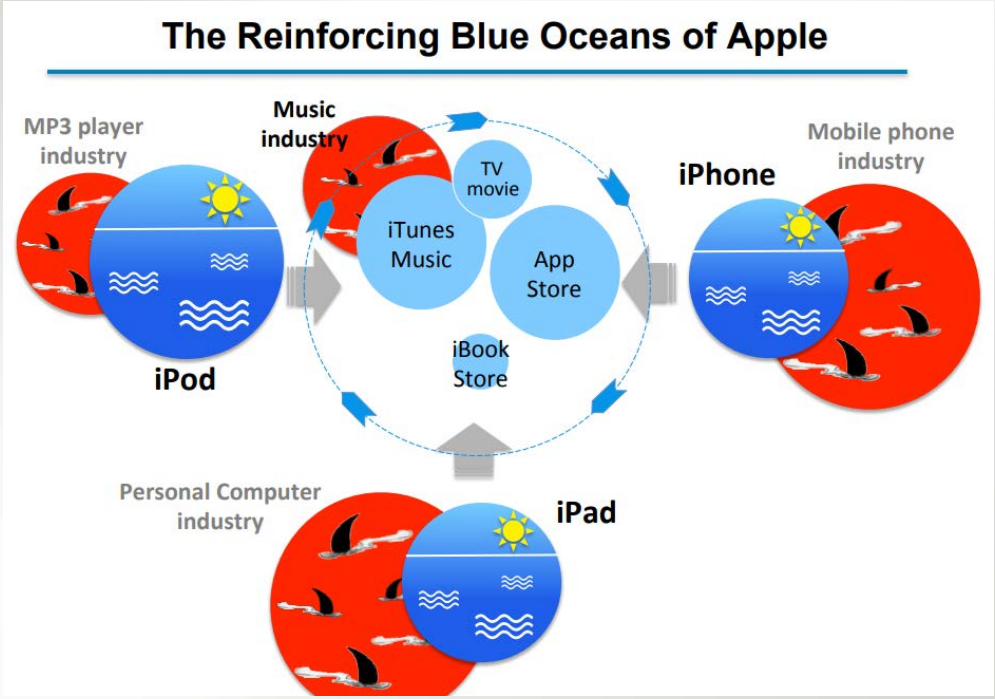
VIVEK BODI - 1344736

UNIVERSITY of HOUSTON
CULLEN COLLEGE of ENGINEERING

OVERVIEW AND MOTIVATION

UNIVERSITY of HOUSTON
CULLEN COLLEGE of ENGINEERING

- In recent years, Apple Inc. innovations are being challenged by its competitors such as Amazon and Samsung.
- Though they're being challenged, Apple Inc. is still considered as a successful company
- Their success formula is not just about developing new products.
- They strive hard to develop innovative business process, and innovation management.



Apple Blue Ocean strategy all Industries

Apple Inc. Challenges – SWOT Analysis

UNIVERSITY of HOUSTON
CULLEN COLLEGE of ENGINEERING

- This chart depicts the success and ongoing challenges (Threats) faced by the company.

APPLE INC. – BUSINESS STRATEGY

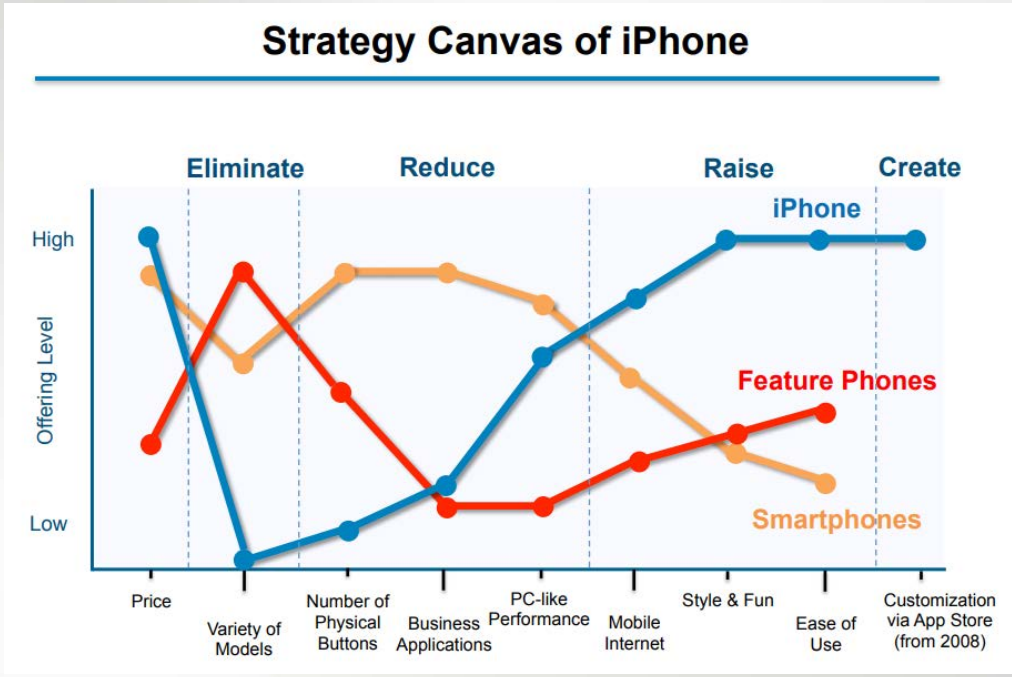
UNIVERSITY of HOUSTON
CULLEN COLLEGE of ENGINEERING

- APPLE INC. is known for its Blue Ocean strategy

iPhone

Eliminate	Raise
Variety of models	Mobile internet Style & Entertainment Ease of use & Simplicity
Reduce	**Create**
Number of physical buttons Embedded business applications PC-like performance (through higher operating system)	Freedom to customize through App Store (from 2008)

Apple Blue Ocean strategy for iPhone



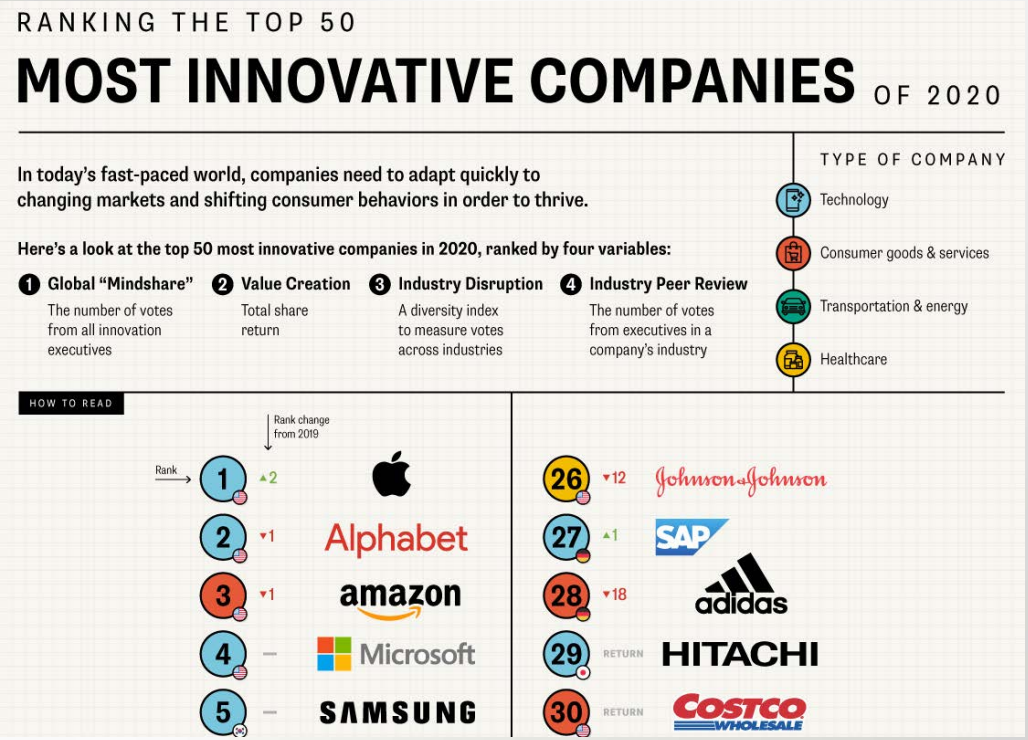
iPhone Strategy compared to other phones

- Apple was quite successfully in innovating the performance of smartphones in 2008 but only flaw they had was the high price point
- Since 2008 till now, Apple had continued developing the best performance smart phone and they were able to beat the competition.

Apple Inc. Innovation Rankings compared to others

UNIVERSITY of HOUSTON
CULLEN COLLEGE of ENGINEERING

- According to the recent survey, Apple is considered as the #1 Ranked Innovative company.
- Apple commitment to understand the user needs and able to prioritize new digital design and technology improvements have led them to be most innovative in 2020.

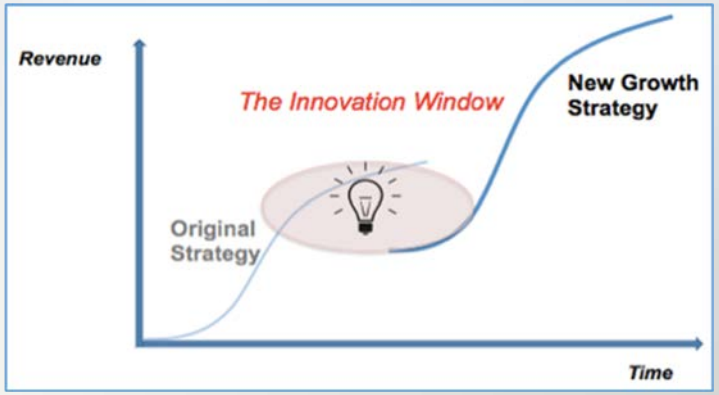


Ang, Carmen. "Ranked: The 50 Most Innovative Companies." *Visual Capitalist*, 30 July 2020, www.visualcapitalist.com/top-50-most-innovative-companies-2020/.

SUMMARY/CONCLUSION

UNIVERSITY of HOUSTON
CULLEN COLLEGE of ENGINEERING

- According to Apple SWOT analysis, the threats for companies' future success are quite significant.
- Their innovations are getting challenged every year, but one thing Apple has delivered is the excellent customer service.
- Their technology performance is reliable than compared to Android products from Amazon and Samsung.
- Apple will continue to be a successful company as their business strategies are being very innovative and their technology is appealing to its customers.




THANK YOU
UNIVERSITY of HOUSTON | ENGINEERING

THE SPACE ECONOMY:
AN INNOVATION DRIVER FOR THE FUTURE

Vittorio Netti | 1813824

MARKET SIZE

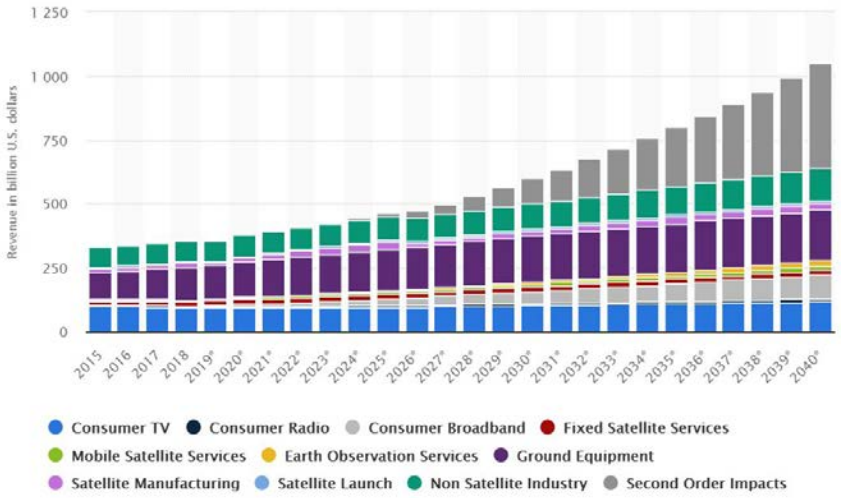
The global Space Market is growing exponentially and is expected to reach the trillion US $ value by 2040.

US$ 256 Billion (2014) **>** **US$ 369 Billion** (2020) **>** **US$ 497 Billion** (2027) ext.

Source: OECD library

A TECHNOLOGICALLY DRIVEN BUSINESS

This explosive growth is directly connected to the technological development of some key-innovations that found new commercial innovations just recently, like the hardware miniaturization that is the direct cause of the success of Cubesat and Smallsat.



THE BUSINESS OF THE FUTURE

One of the side effect of the growth of investments in the Space industry is an increased momentum in the development of new technology. More money are invested, faster the new enabling technologies are developed, opening the doors for new and unforeseen business opportunities. (ex. Asteroid mining)

Source: Statista 2020

NEW BUSINESSES

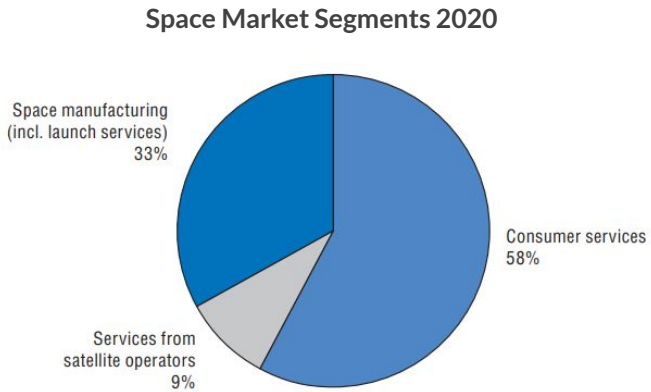
The reduction of the costs became on of the main driver of the New Space Economy, expanding the market`s target.

OLD SPACE BUSINESS

- Satellite manufacturing and launch
- Servicing for national Space Agencies
- Ground sector
- Earth observation
- Ground Defense support
- Satellite Communications

>

CURRENT SPACE BUSINESS



Source: OECD library

>

NEW SPACE BUSINESS

- Space Tourism
- Cubesat and Smallsat
- Satellite internet
- Technology development
- In-Space defense systems
- Asteroid Mining
- Artificial Intelligence
- In-Space Construction
- Human Space exploration

NEW ACTORS

During the last decade, a new generation of companies invaded the market, opening the space race to new countries and actors.

A GENERATIONAL CONFLICT

The New Space Economy is an exciting and future-proof market. The new actors are not only stealing market shares from the big companies but they are also creating totally new market niches, thanks to a revolutionary approach at the technological development.

THE OLD GUARD

For almost 50 years, the Space Business has been an oligarchy of few companies with a tight connection to the government through thousands of bulletproof contracts that guaranteed an incredible flow of public money for technology development, manufacturing and servicing of Space hardware for the DoD and NASA.

>

<

THE NEW TALENTS

The new space era companies found a safe way to break through the lobbism of the big actors: Cost reduction. Since that the public contracts are subject to the "lowest bidder" rule, this strategy has been extremely successful. Guided by few "Unicorns" such as SpaceX, the new generation of space companies proven to be innovation-driven but also very reliable.

IMPACT ON THE GLOBAL ECONOMY

Contrary to the common idea of Space business, its biggest impact is on earth applications and innovations

A WORLDWIDE INNOVATION

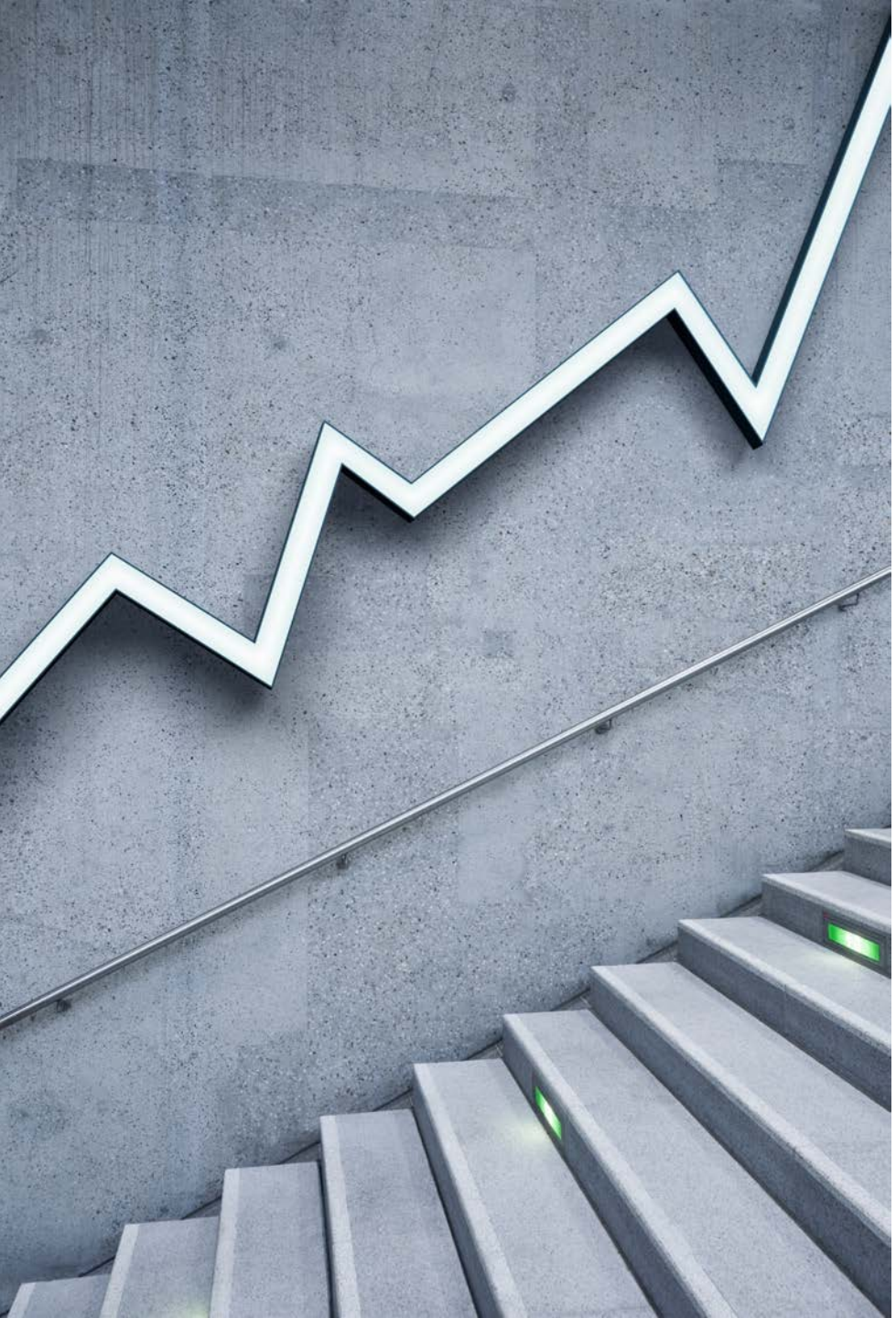
One of the fundamental aspects of the Space Economy is that is not tied to the ground: Satellite manufacturers and operators can provide their services all around the globe with no localization issues.

NEW OPPORTUNITIES

The last developments in specific technologies like the big constellations of smallsat are changing forever other innovations that until now have been considered mainly ground-based. This parallel development allows Space companies to enter into competitions with other big actors from other fields of the communication industry.

NEW TECHNOLOGIES

The Space technologies, now available for a fraction of the cost from just 20 years ago, enable a totally new development for many different fields, like Agriculture, Artificial Intelligence, Defense and Security, Communications, Environmental Control, and many others. These innovations are even cheaper than if operated through ground-based technologies.



“Startup business decision-making strategies in innovation”

MECE 5397: ENGR INNOVATION AND ENTREPRENEURSHIP

FINAL PROJECT PRESENTATION

VON SURRIGA 1482102

Introduction

Successful start up businesses depend on multiple factors in the business industry. It usually consists of idea, economy, market, competition, business capital, and most importantly people.

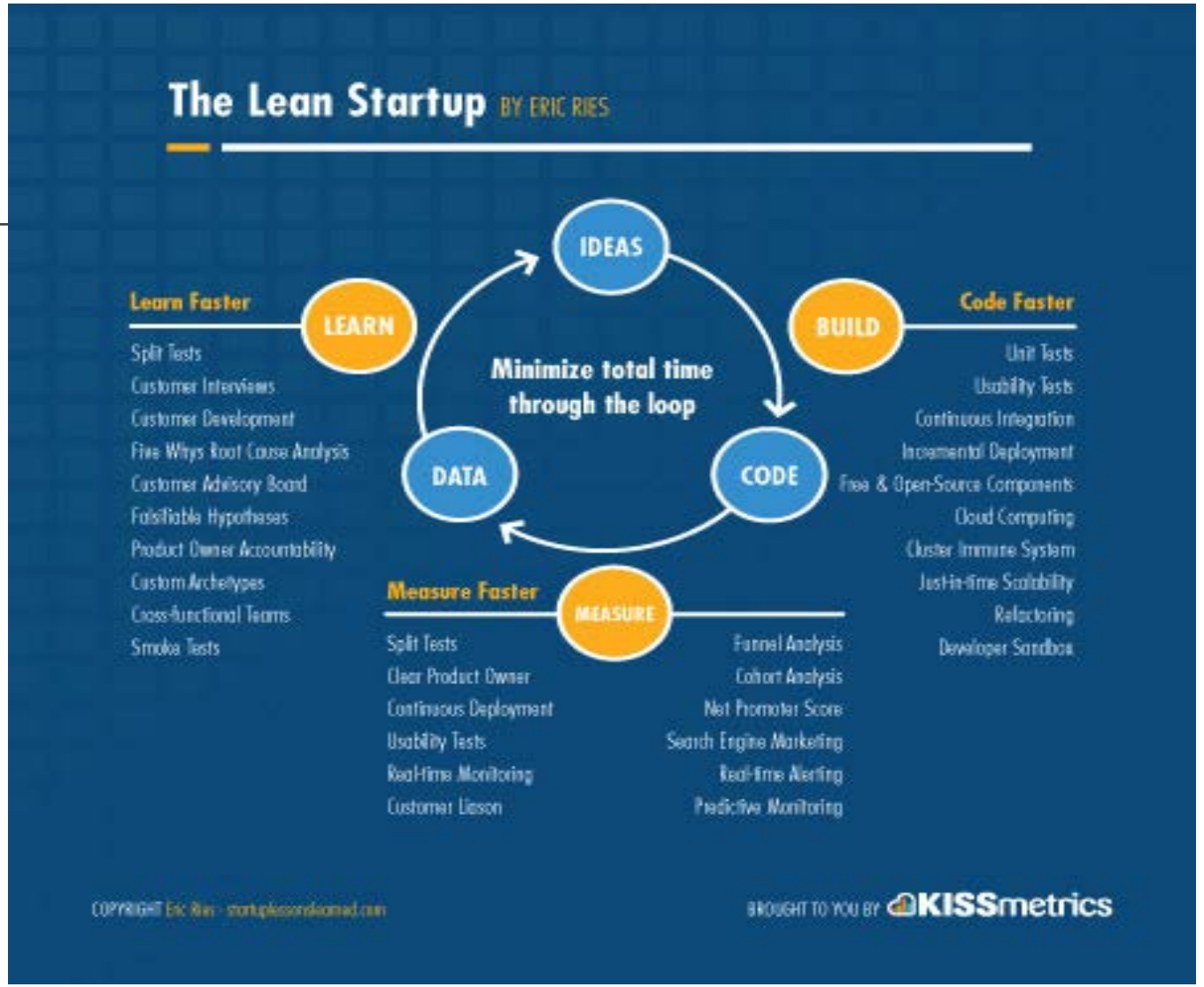
The lean startup methodology provides an approach to creating and managing startups and get a desired product to customer's hands faster.

The decision-making strategies developed in the study proves that the "24 Steps to a Successful Startup" aligns with the proposed principles of lean startup for startup decision-making strategies.

Summary

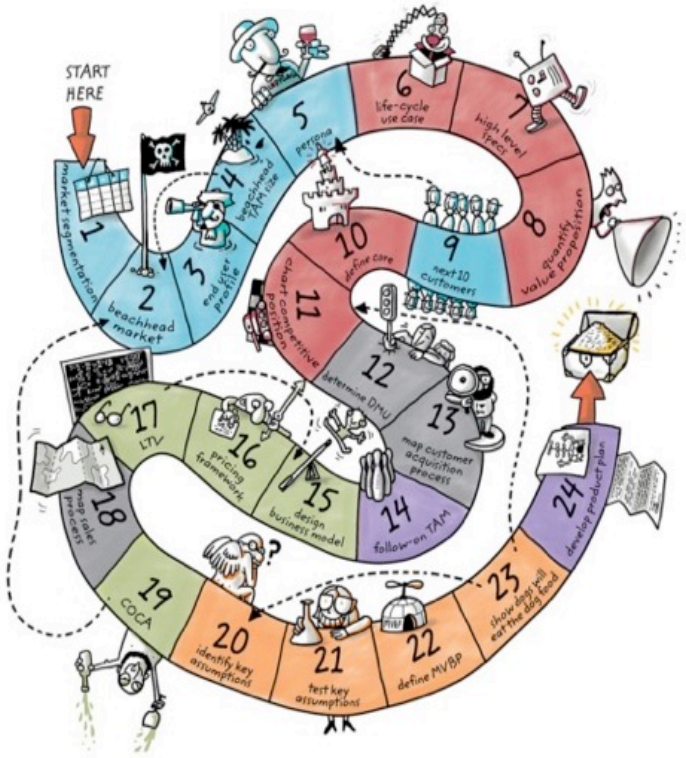
The Lean Startup method shows how and when to drive, steer, or turn a startup to preserve and grow a business with maximum efficiency.

Using this approach, companies can create order not chaos by providing tools to test a vision continuously so that when the product is ready for distribution, it will have readily established customers.



24 Steps to a Successful Startup

1. Getting Started & Market Segmentation
2. Select a beachhead (pilot) market
3. Build an end user pro
4. Calculate the total addressable market (TAM) size for the beachhead market
5. Profile the persona for the beachhead market
6. Full life cycle use case
7. High-level product specification
8. Quantify the value proposition
9. Identify your next 10 customers
10. Define your Core
11. Chart your competitive position
12. Determine the customer's decision-making unit (DMU)
13. Map the process to acquire a paying customer
14. Calculate the TAM size for follow-on markets
15. Design a business model
16. Set your pricing framework
17. Calculate the lifetime value (LTV) of an acquired customer
18. Map the sales process to acquire a customer
19. Calculate the cost of customer acquisition (COCA)
20. Identify key assumptions
21. Test key assumptions
22. Define the minimum viable business product (MVBP)
23. Show that "the dogs will eat the dog food"
24. Develop a product plan



Conclusion

BUSINESS PLANS ARE NOT AS USEFUL AS WHAT THEY ARE MADE OUT TO BE. IT ALSO STATES THAT STARTUPS SHOULD THINK BIG, START SMALL, AND IF YOU ARE NOT GROWING THEN YOU MIGHT CEASE TO EXIST.

ANOTHER ADVICE IN THE DECISION-MAKING PROCESS IS TO UNDERSTAND CAUSATION IN THE TECH INDUSTRY AND TO NOT CONFUSE RISK WITH PROBABILITIES. A COUNTER-PRODUCTIVE, YET FACTUAL ADVICE, STATES THAT TOO MUCH INFORMATION INCREASES CONFIDENCE, BUT NOT NECESSARILY ACCURACY.

PICKING THE RIGHT CATEGORY WHERE THE MONEY IS FLOWING AND CREATING A UNIQUE VALUE TO THE INNOVATION IS GOOD PRACTICE IN STARTUPS.

LASTLY, KNOWING THE RIGHT ENVIRONMENT WHICH IS OPEN ALLOWS ACCESS TO CONNECTION, COMPETENCE, AND CAPITAL.

Addressing Critical Competitive Factors in Startup Survival

Name: Vivek Pillai
UH ID#: 1512307
MECE 5397: Engineering Innovation and Entrepreneurship
Instructor: Dr. Haleh Ardebili

Introduction

- This study aims to address the top factors in startup survival, by providing background and analysis on these factors and providing empirical solutions
  - Top factors in startup survival include market fit, cash management, and competition
  - Market fit elements include consumer demand, product marketing, etc.
  - Competitive elements include pricing, ease of access, customer value, etc.
  - Cash management elements include venture funding, development costs, personnel and resource cash flows

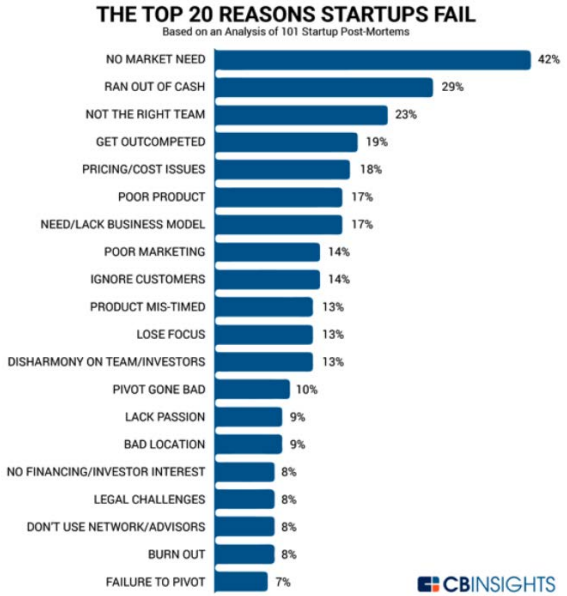


Figure 1: Reasons for Product Failure
"CB Insights." *The Top 20 Reasons Startups Fail*, 6 Nov. 2019, www.cbinsights.com/research/startup-failure-reasons-top/.

Solutions: Market Need

Viable market need verification solution: customer-centric innovation.

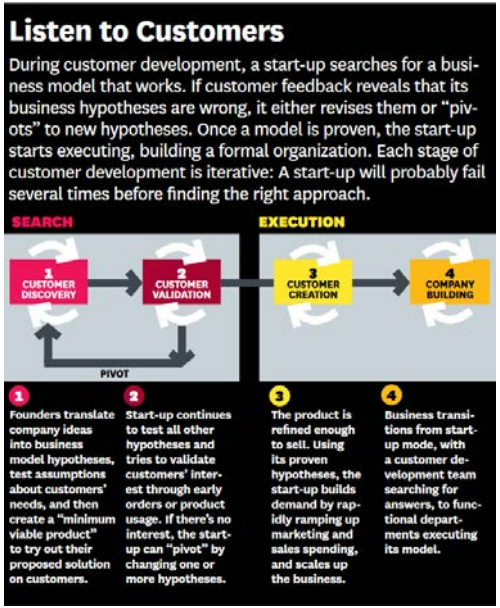


Figure 1: Customer Centric- Innovation
Blank, Steve. "Why the Lean Startup Changes Everything". *Harvard Business Review, Entrepreneurship and Management Journal,* 2013.

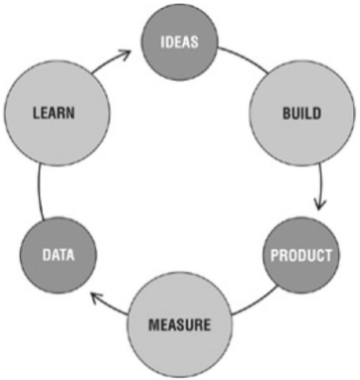


Figure 2: Build-measure-learn feedback loop,
Frederiksen & Brem, "How do entrepreneurs think they create value? A scientific reflection of Eric Ries' Lean Startup approach."*International Entrepreneurship and Management Journal, vol.13, 2017.*

Lean startup method, in which market need is continually tested through the success of minimum viable products and customer surveys. See figure 4 for the customer-centric development approach. Continuously completing customer validation throughout the development, as well as the execution process, aids in ensuring market fit.

Minimum Viable Products are built, measured for customer success, re-evaluated, and adjusted. See figure 5.

Solutions: Cash Management and Competition

Viable out-competition and cash management solutions include startup cooperation and lean investment methods.

Empirical findings from the USF Muma Business Review, in a study of 296 startup axial code samples and establishment survival rate data from the Bureau of Labor Services and the Federal Reserve, showed that "utilization of willing and able allies, and purposeful margin of safety models" were more indicative measures of success than external factors such as GDP change, prime rate change, and accelerator stimuli.

Gonzalez, Gilbert. "What Factors Are Causal to Survival of a Startup?" *Muma Business Review*, vol. 1, 18 Aug. 2017, pp. 097–114., doi:10.28945/3845.

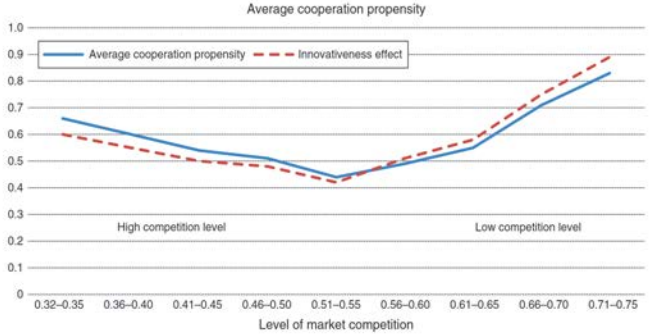


Figure 4: Competition Level and Cooperation Propensity Hashai, Niron, and Sarit Markovich. "Market Entry by High Technology Startups: The Effect of Competition Level and Startup Innovativeness." *Strategy Science*, vol. 2, no. 3, 3 Sept. 2017, pp. 141–160., doi:10.1287/stsc.2017.0033.

Cooperation between new startups and incumbents is supported as a viable solution that has more impact than cyclical economic factor such as the GDP change and prime rate change. Figure 5 shows that cooperation between startups and incumbents best occur between high and low competition levels, rather than mid-tier competitors.

Table 4 Differences between failed startup and successful startup

Group	Result	Failed Startups		Successful Startups	
	Stage	Emer -gence	Emer -gence	Success & Growth	Success & Growth
	Business Type	B2C	B2B	B2C	B2B
Personal	Years of Experience	20	21	3	4
	Age at Inception	43	47	27	27
	Reason for startup	Great product idea	Great product idea	Financial independence	Financial independence
	Partners Skill leading to formidable team	No	No	Yes	Yes
	MBTI profile	ENFP	ENFJ	ESFJ	ESFJ
Product	Type of Service	Platform	Product	Platform	Product
	MVP Planned	No	Yes	Yes	Yes
	Roadmap	Grand Product	Roadmap	Roadmap	Roadmap
	Time for product development in months	30	3	4	6
Finance	Time to Realize Revenue in months from MVP	No	No	6	6
	Source of Funds	Savings, Friends and Relatives	Savings	Savings and Reinvestment	Savings and Reinvestment
	Investor availed	Revenue Required	Revenue Required	Investor Avoided	Investor Avoided
	Revenue Realization	No	No	Yes	Yes
Market	Market Growth	No	No	68 countries	3 countries
Eco -system	Government policy leverage	No	No	No	Yes
	Mentorship availed	No	No	Yes	Yes

Figure 5: Differences between failed startup and successful startups Kalyanasundaram, Ganesaraman. "Why Do Startups Fail? A Case Study Based Empirical Analysis in Bangalore." *Asian Journal of Innovation and Policy*, 2018, doi:http//dx.doi.org/10.7545/ajip.2018.7.1.079.

The B2B and B2C that re-invested the profits of their previous ventures and used company savings as majority shares of venture funding, rather than external investment, succeeded.

Conclusion

- Addressing market need through customer-centric innovation, entailing continuous customer validation and product adjustments is a viable solution.
- Addressing competition by cooperation between startups is an empirically backed solution.
- Funding ventures through re-investment of profits is a viable form of cash management, as opposed to a majority share of external investment for post 1st seed ventures.

MAJOR CHALLENGES FOR MODERN STARTUPS

YAN TONG NG ZHEN

MOTIVATION, BASICS, AND OVERVIEW

Motivation:

- To identify and research the major challenges leading to startup failure

Basics:

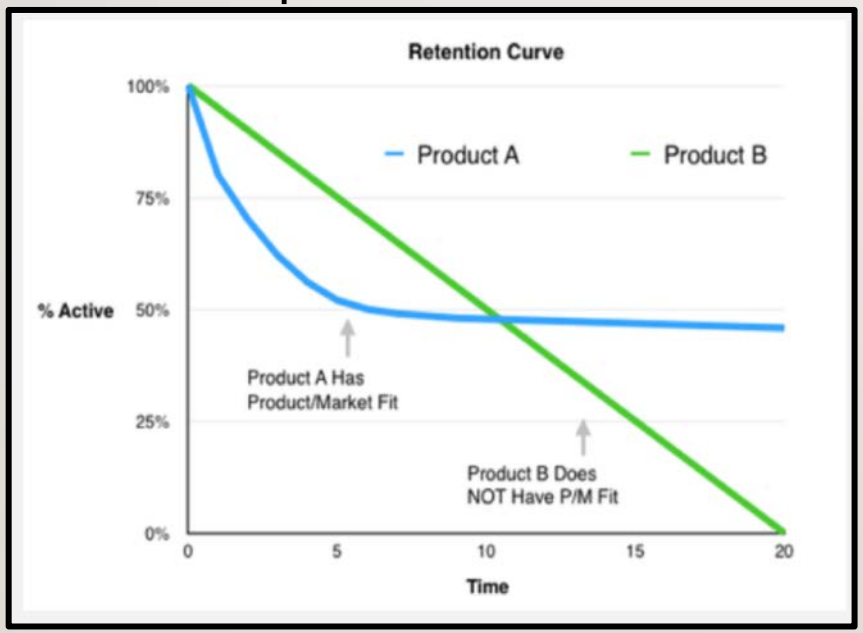
- Startups bring new products and services to the market to make profit. Startup challenges can sometimes cause failure of the new company

Overview (startups' challenges):

- No product/market fit
- Managing finances
- Competition
- Customer issues
- Not the right team

STARTUPS' CHALLENGES

1. No product/market fit



Low or no demand causes startup to become less active in the market

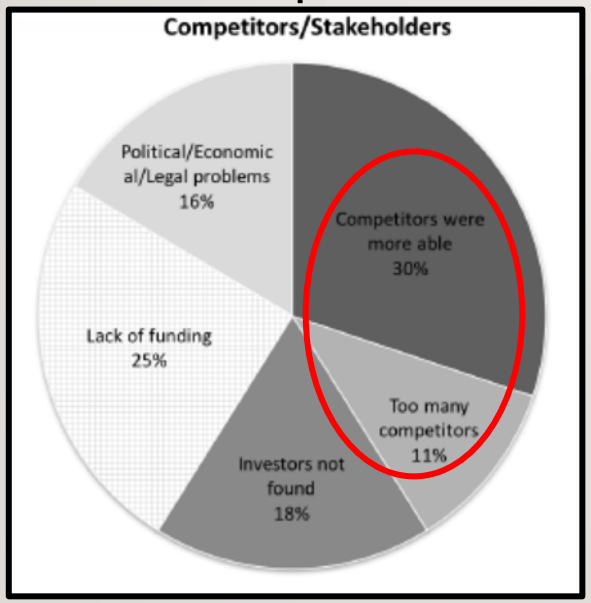
2. Managing Finances

Growth Stage	Financing Stage	Sources of Financing
Development	Seed	Founders, Family & Friends; Crowdfunding; Business Angels;
Startup	Startup	Founders, Family & Friends; Business Angels; Incubators & Accelerators; Early stage VC;
Survival	First round	Business operation; Incubators; VC funds; Trade credit; Commercial banks; Subsidies;
Rapid growth	Second round, Mezzanine financing	Business operation; VC funds; Trade credit; Commercial banks; Investment banks;
Early maturity	Seasoned financing – Issuing Bonds & Stock; Obtaining bank loans;	Business operation; Commercial banks; Investment banks;

Difficulty in obtaining funds at different stages of a startup

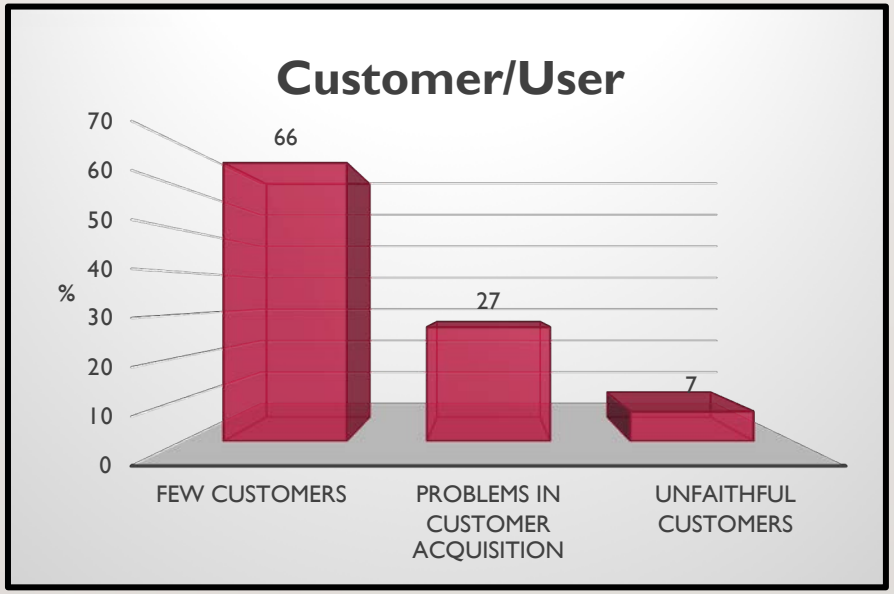
STARTUPS' CHALLENGES

3. Competition



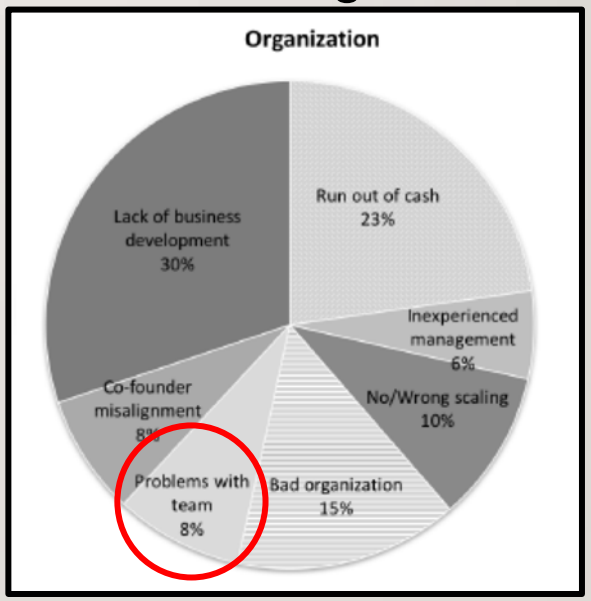
Competition makes up 41% of the issues grouped as competitors/stakeholders

4. Customer issues



Not enough effort in attracting clients causes most of startups to have few customers

5. Not the right team



Not having a good team makes up 8% of the issues grouped as organization

SUMMARY/CONCLUSION

- Most challenges faced by startups can be anticipated and potential solutions can be found in advance
- Startups internal sources create more challenges than external sources
- Understanding the challenges can greatly increases the chances of having a successful startup – survival rate curve can decrease at a lower rate