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Lean Startup Approaches

the way to check whether the market wants your idea

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Agenda

- Fallacy of the «perfect business plan»
- Models for startup development
- Focus on Lean Startup Approaches
- Key principles of the Lean method

Lessons Learnt from startups failures&successes

1

«Business Plans rarely survive first contact with customers»

2

«No one besides VC and the late Soviet Union requires 5 years plans to forecast complete unknowns»

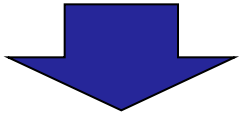
3

«Start-ups are not smaller versions of large companies»

Models for Start ups development

- Product development

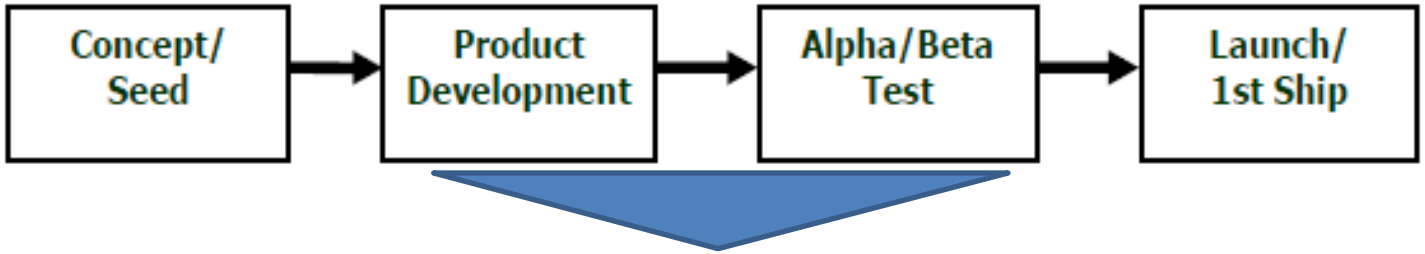
"Too many startups begin with an idea for a product that they think people want. They then spend months, sometimes years, perfecting that product without ever showing the product, even in a very rudimentary form, to the prospective customer. When they fail to reach broad uptake from customers, it is often because they never spoke to prospective customers and determined whether or not the product was interesting" (Ries, 2012).



- Waterfall development
- Agile Development
- Customer development
- Lean Startup

Product Development ('50)

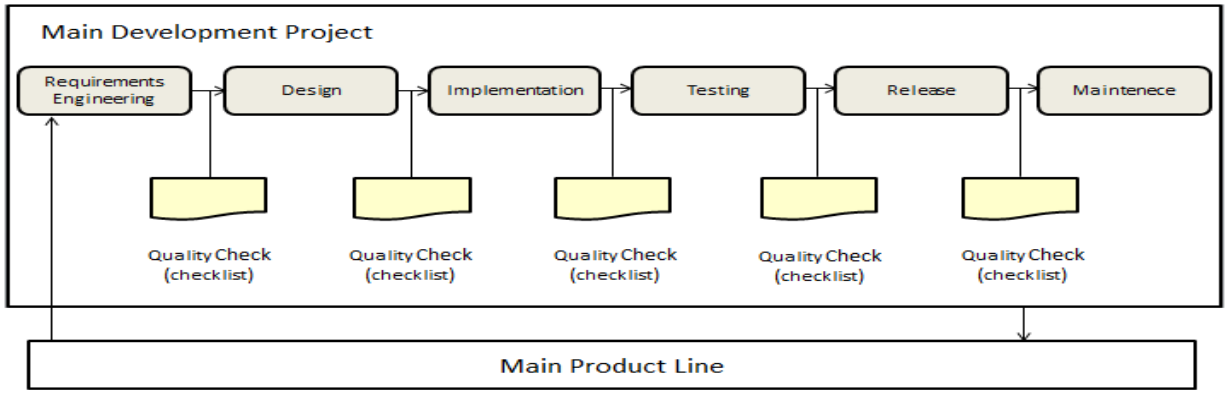
- Methodology for new products development, focused on the product itself, divided in 4 phases:



PROS	CONS
Effective & efficient in KNOWN markets	1. Customers are NOT considered 2. Focus on the go to market DATE 3. Emphasis on EXECUTION, not on learning and discovering processes 4. Lack in significance of the milestones 5. Ramping up too rapidly

Waterfall Development ('70) *(Stage-Gate Model)*

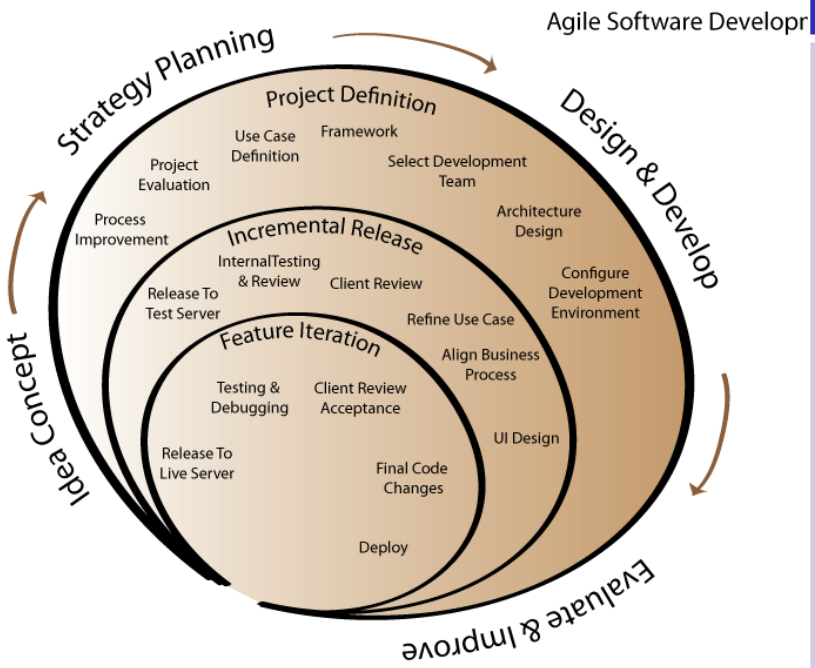
- In a waterfall model, each phase must be completed fully before the next phase can begin.
- At the end of each phase, a review takes place to determine if the project is on the right path and whether or not to continue or discard the project.
- In waterfall model, phases do not overlap



PROS	CONS
1. Simple and easy to understand and use 2. Easy to manage due to the rigidity of the model – each phase has specific deliverables and a review process 3. Phases are processed and completed one at a time. 4. Works well for smaller projects where requirements are very well understood	1. Once an application is in the test stage, it is very difficult to go back and change something that was not well-thought out in the concept stage 2. No working software is produced until late during the life cycle 3. High amounts of risk and uncertainty 4. Not a good model for complex and object-oriented projects 5. Poor model for long and ongoing projects 6. Not suitable for the projects where requirements are at a moderate to high risk of changing

Agile Development (’90)

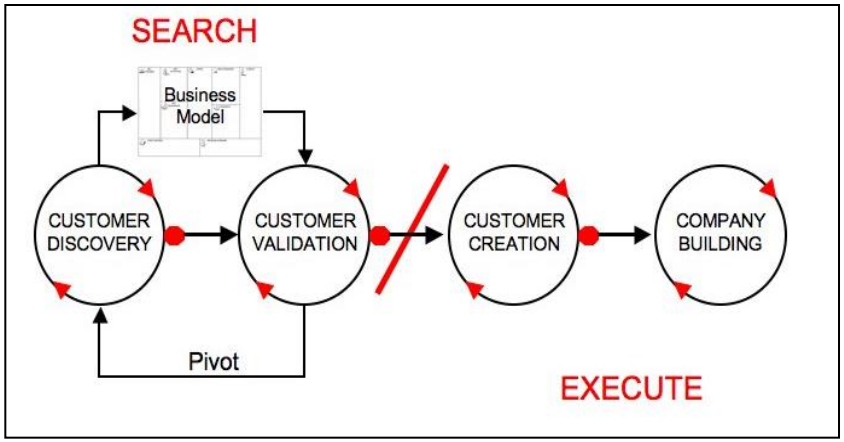
- Agile software development is a group of software development methods based on iterative and incremental development.
- It promotes adaptive planning, evolutionary development and delivery, a time-boxed iterative approach, and encourages rapid and flexible response to change.



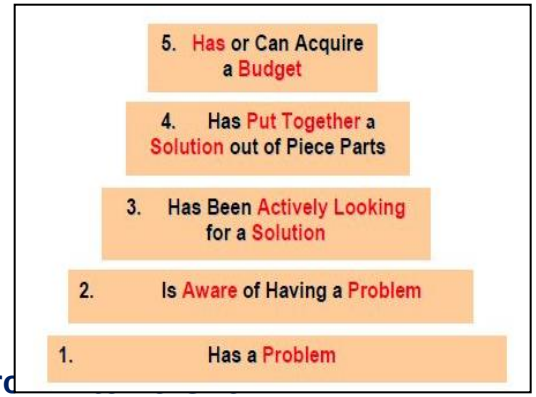
PROS	CONS
1. Customer satisfaction 2. Early feedbacks/integrated tests 3. Interaction, collaboration face to face communication 4. Flexibility 5. Working before knowing all the requirements 6. Saving Money and time 7. Improvement in productivity	1. Customer engagement 2. Lack in documents 3. Impossibility to plan resources/budget needed 4. Difficulty in evaluating each developer 5. Highly skilled members required

Customer Development

- Customer Development focuses on customers and it is divided in 4 phases
- The first product is not designed to satisfy a mainstream customer but it's tested on a very small group of early and «visionary» customers (evangelists)



EVANGELIST



PROS	CONS
1. Iterative 2. Efficient & Effective 3. Improved learning 4. Time saving 5. Avoiding early scaling	1. Specific on business areas 2. Eary evangelist are difficult to be found 3. Evangelist are easily influenced by others or by the company's view 4. Vicious circle («bugs» detection never ends)

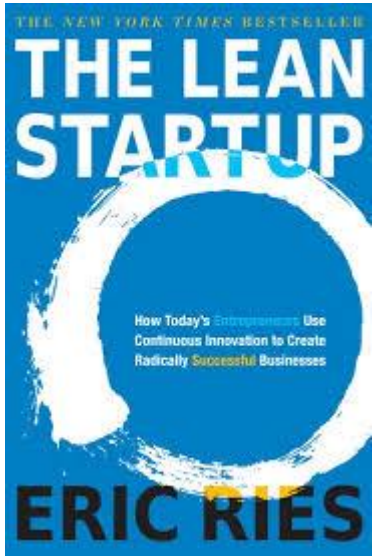
Lean Startup Definition

no waste = not creating value directly

waste = building things that no one uses!

worst enemy = the customer!

Lean Startup (2008) is an approach for launching businesses and products, that relies on **validated learning, scientific experimentation, and iterative product releases** to *shorten* product development cycles, *measure* progress, and *gain* valuable customer feedback. In this way, companies, especially startups, can design their products or services to *meet the demands of their customer* base without requiring large amounts of initial funding or expensive product launches



*"Lean Startup isn't about being cheap [but is about] being **less wasteful** and still doing things that are big."*

*"Startup success can be **engineered** by following the process, which means it can be **learned**, which means it can be **taught**. The Lean Startup method teaches you how to drive a startup-how **to steer**, when **to turn**, and when to **persevere-and grow** a business with maximum acceleration."*

Who is «an entrerpreneur»?

There are three starting points for entrepreneurship: ***a technology, idea, or passion****. If you have a passion but no specific idea or technology, do some introspection to figure out the best use of your knowledge, skills, connections, financial assets, and work experience.*

Lean Startup
Key principles

ELIMINATE UNCERTAINTY: Using the Lean Startup approach, companies can create **order** not chaos by providing **tools to test** a vision continuously

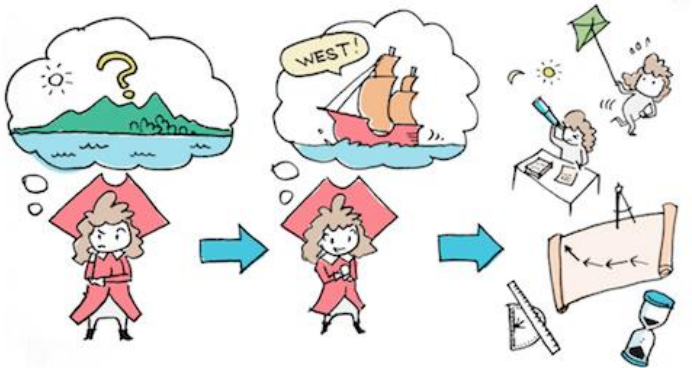
WORK SMARTER NOT HARDER: By the time that product is ready to be distributed widely, it will already have established customers

DEVELOP A MVP: A core component of Lean Startup methodology is the build-measure-learn feedback loop. The first step is figuring out the problem that needs to be solved and then developing a minimum viable product (MVP) to begin the process of learning as quickly as possible

(minimum viable product)

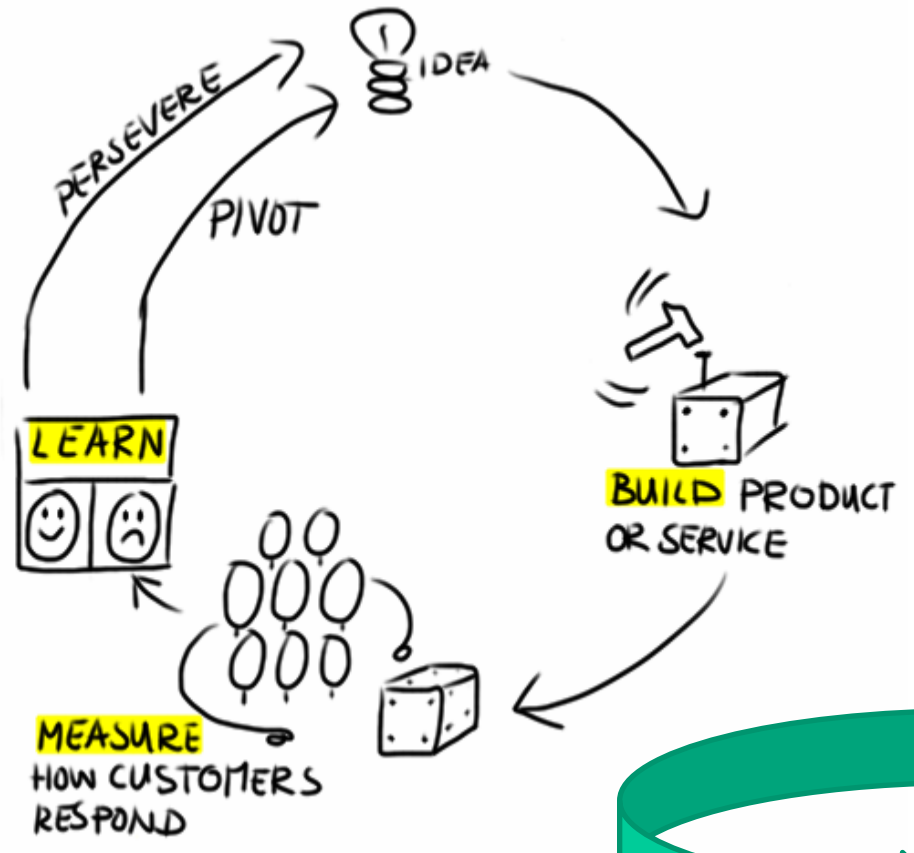
(product)

Presented by Braintree

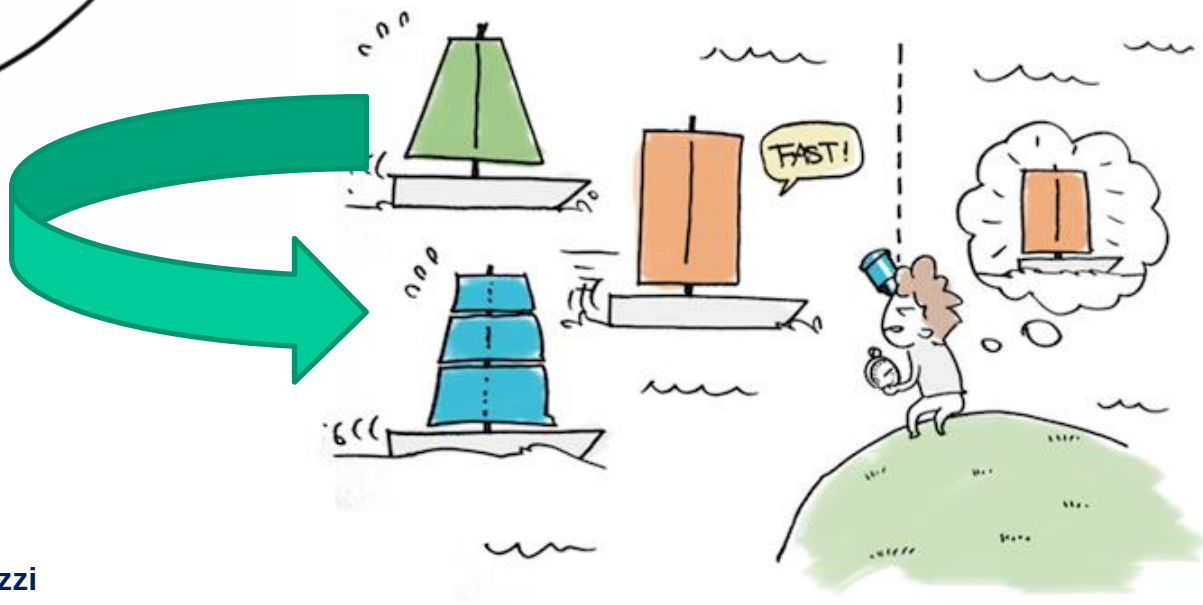


VALIDATED LEARNING: Progress in manufacturing is measured by the production of high quality goods. The unit of progress for Lean Startups is **validated learning** - a rigorous method for demonstrating progress when one is embedded in the soil of extreme uncertainty

Lean Startup
Build-Measure-Learn Loop

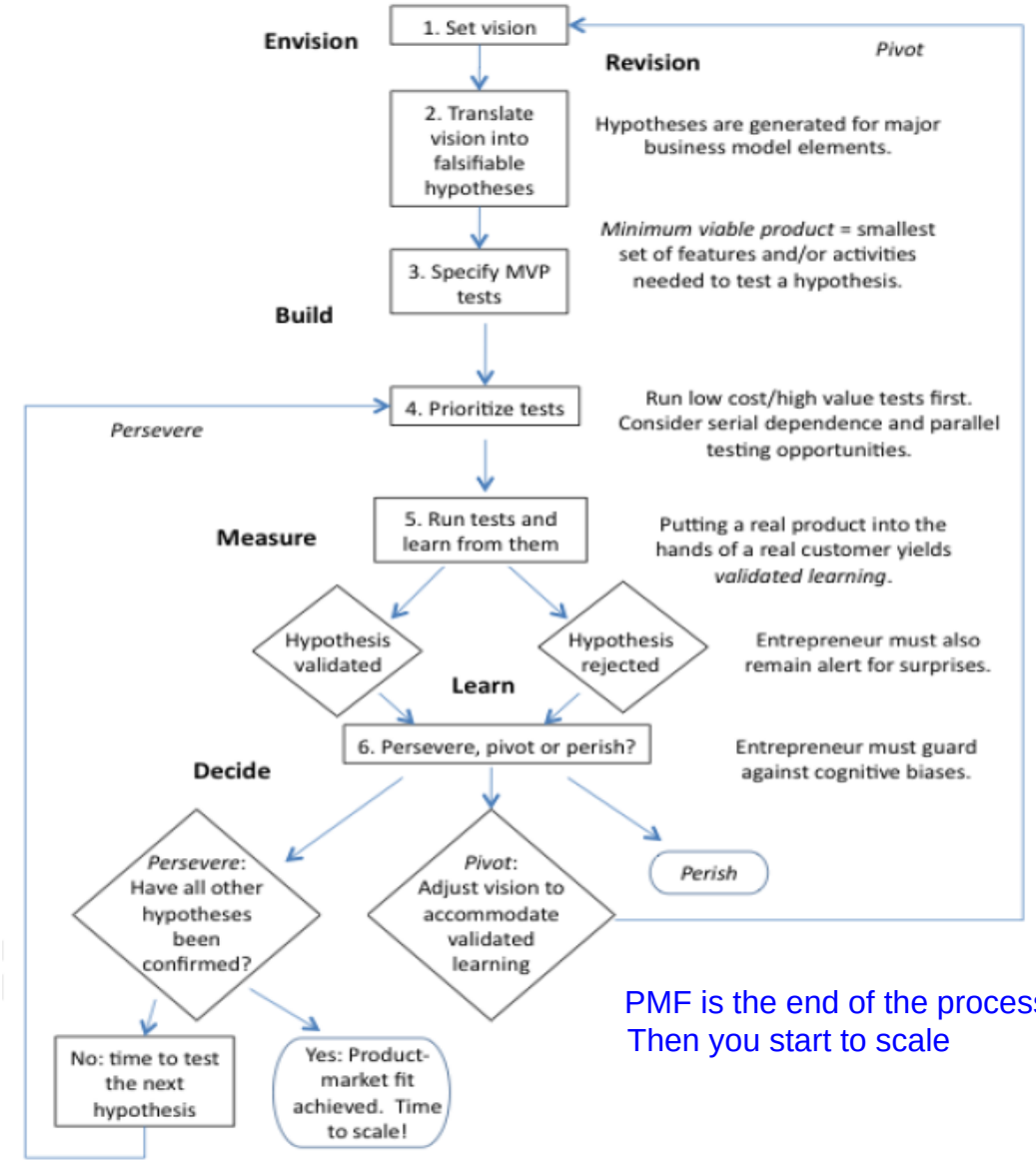


Build-Measure-Learn: How do you build the fastest ship? You try to build and test your hypothesis; you measure the result; and then you learn new knowledge that you can bring to your next ship design.



Process Flow Lean Startup (Eisenman et al. 2012)

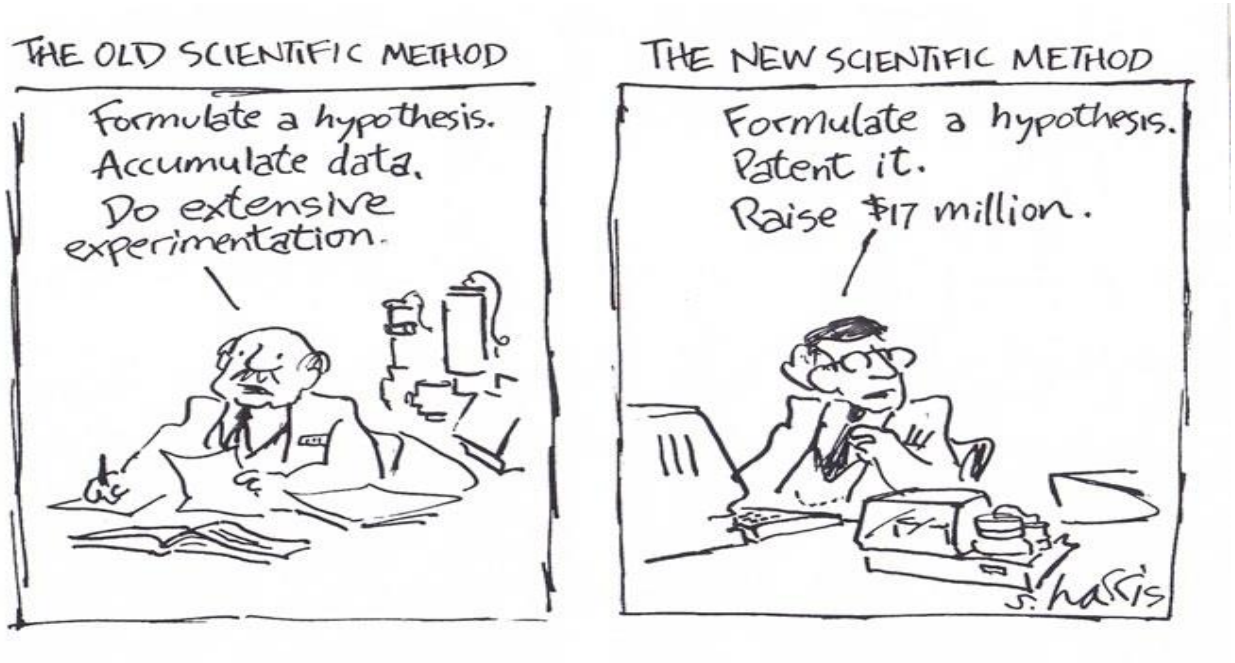
vision = IDEA

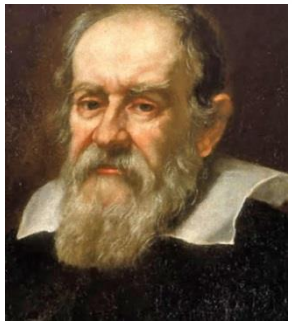


PMF is the end of the process
Then you start to scale

Focus on Lean Start up
FALSIFIABLE HYPOTHESIS

The high level of uncertainty means that startups need to make the best possible **guesses** as to what kind of product and market to target, thus minimizing the chances of producing waste**.**





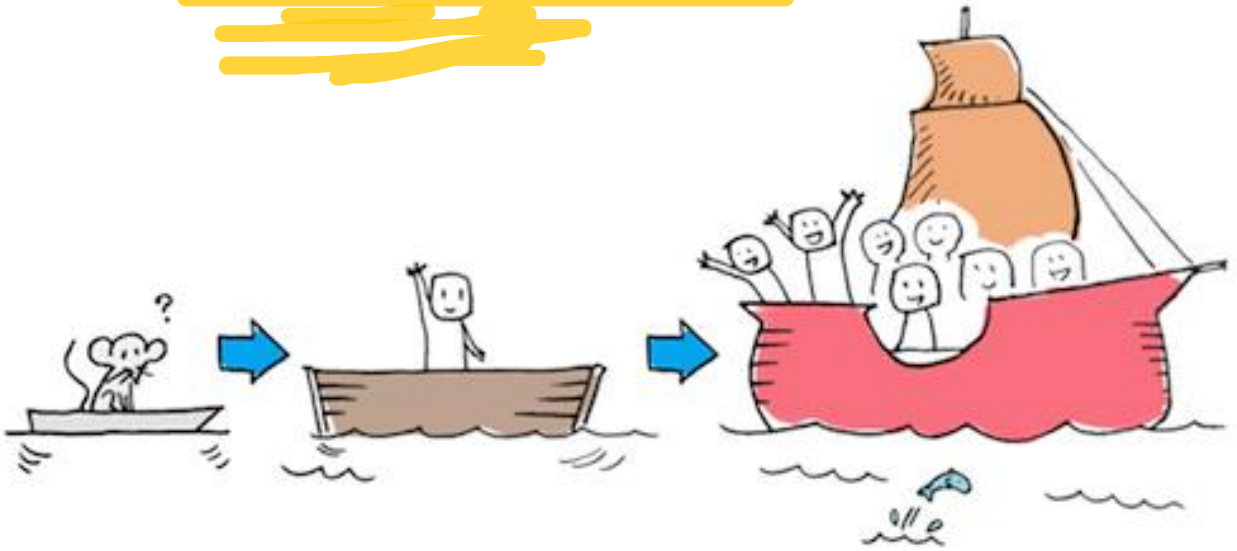
vs.

Example
FALSIFIABLE HYPOTHESIS

A lean startup will approach these assumptions with two things in mind:
1. Make these **assumptions testable and tangible**, not abstract.
2. Know **which of your assumptions are the most uncertain, and test these risky assumptions first**

Focus on Lean Start up
MVP

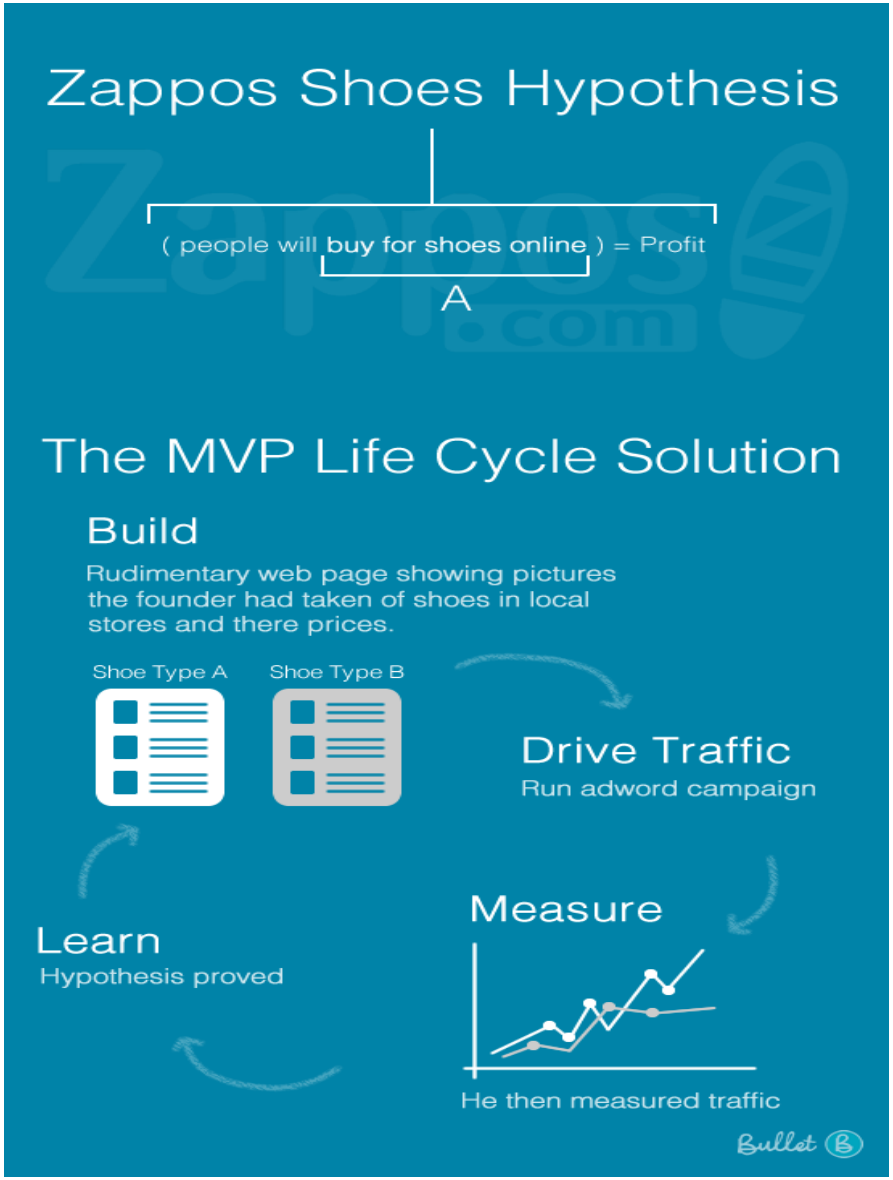
- **MVP**: Contrary to traditional product development, which usually involves a long, thoughtful incubation period and strives for product perfection, the goal of the MVP is to begin the process of learning, not end it. Unlike a prototype or concept test, an MVP is designed not just to answer product design or technical questions. Its goal is to test fundamental business hypotheses.



MVP: You want to build a huge ship, but instead of building the ship right from the beginning, you start by testing your idea with minimal design to see if it floats.

Example
MVP

"There's a huge difference between what people say and what they do" (Dan Ariely,2008).

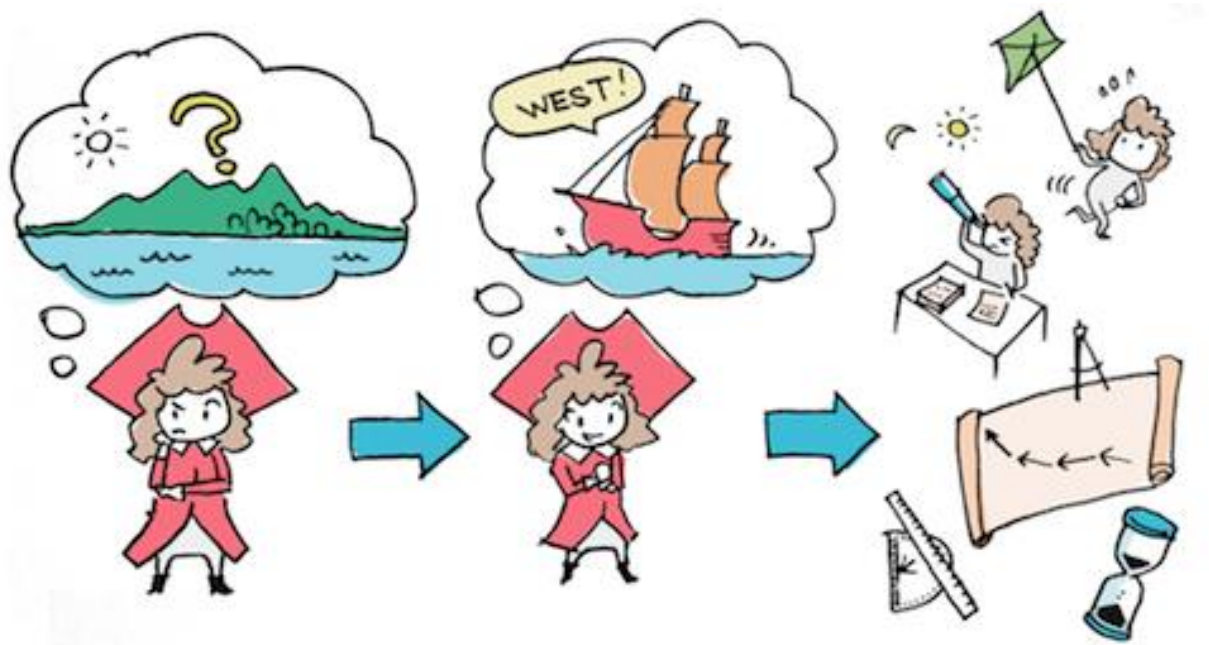


Dropbox MVP

- The founding team was made up of engineers, as the product demanded significant technical expertise to build
- Investors would explain that this "market space" was crowded with existing products, none of them had made very much money, and the problem wasn't a very important one. Drew would ask: "Have you personally tried those other products?" When they would say yes, he'd ask: "Did they work seamlessly for you?" The answer was almost always no.
- *The challenge was that it was impossible to demonstrate the working software in a prototype form.*
- In parallel with their product development efforts, the founders wanted **feedback from customers** about what really mattered to them. In particular, Dropbox needed **to test its leap- of- faith question: if we can provide a superior customer experience, will people give our product a try?**
- They **uploaded a demonstration video** on Hacker news on April 2007
- The **video drove hundreds of thousands of people to the website**. **The beta waiting list went from 5,000 people to 75,000 people literally overnight**.
- Using Lean Startup principles, in just 15 months, Dropbox went form 100,000 registered users to over 4,000,000

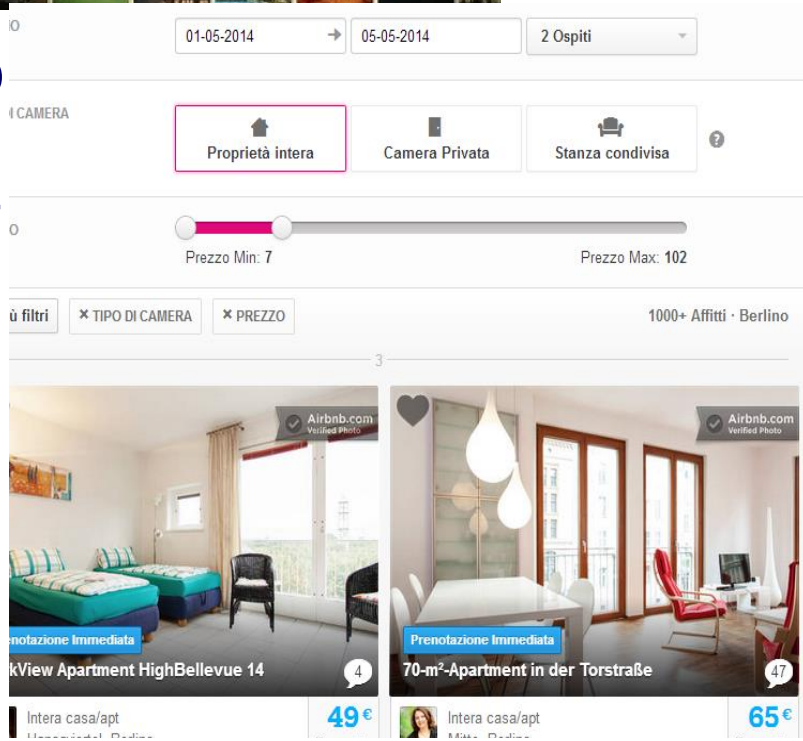
Dropbox
Lessons learnt

Focus on Lean Start up
VALIDATED LEARNING



Validated learning: You believe you'll find a new continent if you keep sailing west. So, you test your idea and verify the route using scientific methods and measurements.

Lean Analytics
Airbnb case



STEP 1: FIGURE OUT WHAT METRIC TO IMPROVE

The metric they wanted to improve was the number of nights that a property was rented. Notice that this is more central to their business than simply measuring revenue: Airbnb does well if its homeowners do well, and for it to succeed, it needs listed properties to be rented often so the homeowners will stick around.

The company knew that to succeed, they needed a significant improvement in rental rates per property.

- One Metric That Matters: "Number of nights rented."
- KPI: Property bookings
- Target: (not publicly known)
- Current level: (not publicly known)

Lean Analytics
Airbnb case

STEP 2: FORM A HYPOTHESIS

Properties with better pictures rent more often.

- Perhaps they had noticed that the pictures of those properties looked, to them, more professional.
- Maybe they realized that one common complaint from renters was that the property didn't actually look like the pictures on the site.
- Maybe they found that people would most often abandon a listing right after seeing photographs.
- Maybe they analyzed the metadata from pictures and found that there was a strong correlation between properties that rented often and expensive camera models.

Lean Analytics
Airbnb case

STEP 3: CREATE THE EXPERIMENT

- *Who is the campaign for?* Travelers looking at listings on Airbnb.
- *What do you want them to do?* Decide to rent a property more frequently.
- *Why do they do it?* Because the photographs look professional and make the property look beautiful

Find out if travelers will book more properties because of professionally photographed listings enough to improve the property bookings by X%.

Airbnb's experiment consisted of something that looked like a real feature, but under the covers was really just humans and contracted photographers. During the experiment they took pictures of properties, and then measured the KPI, comparing properties that had been photographed to those that hadn't.

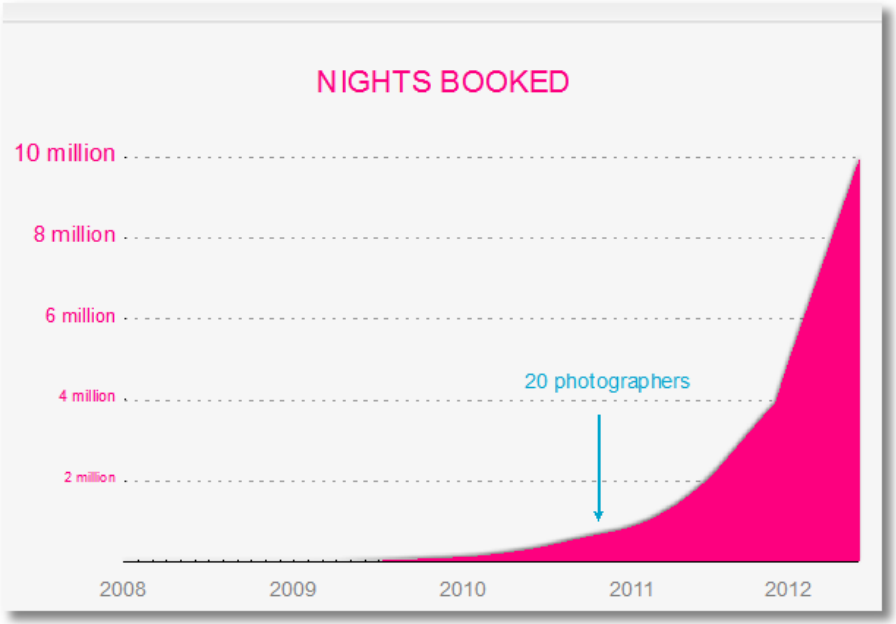
Lean Analytics
Airbnb case

STEP 4: MEASURE PERFORMANCE

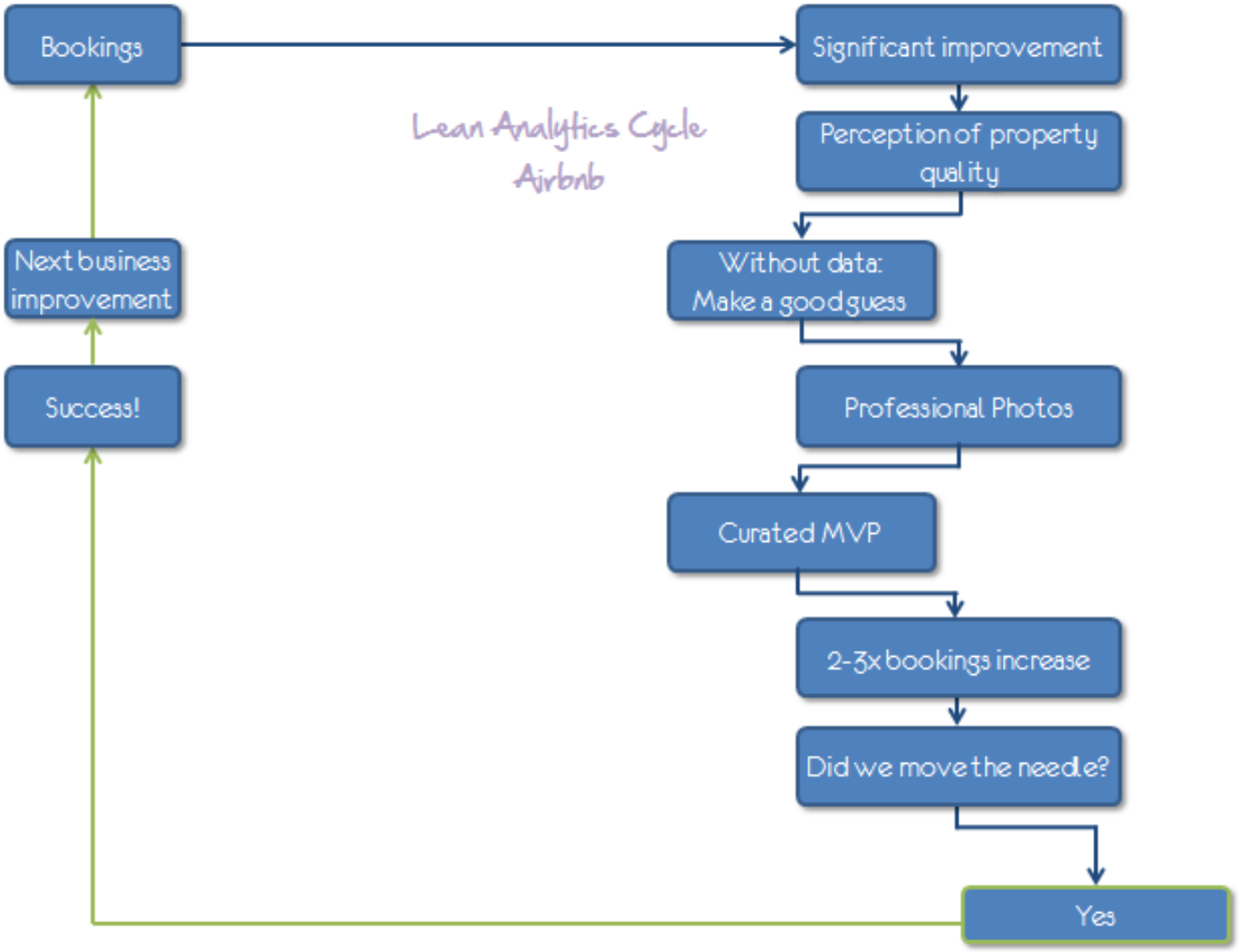
Airbnb measured the bookings from the few properties that had professional photos and compared the rate of bookings with properties that only had photos taken by property owners

The properties with professional photography had 2-3 times the number of bookings!

By 2011, the company had 20 full-time photographers on staff



Lean Analytics
Airbnb case



Focus on Lean Start up
PIVOT

Pivot (Basketball):
to keep one foot in place while holding the ball and moving the other foot one step in any direction.

Famous Pivot

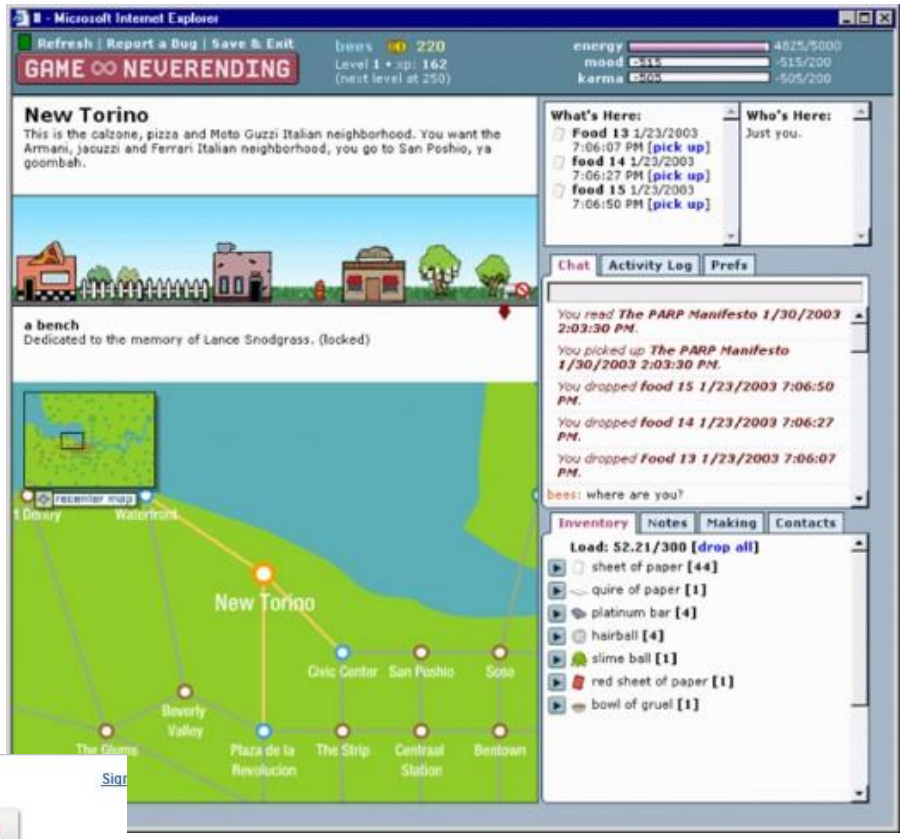
Youtube: YouTube began life as a video dating site

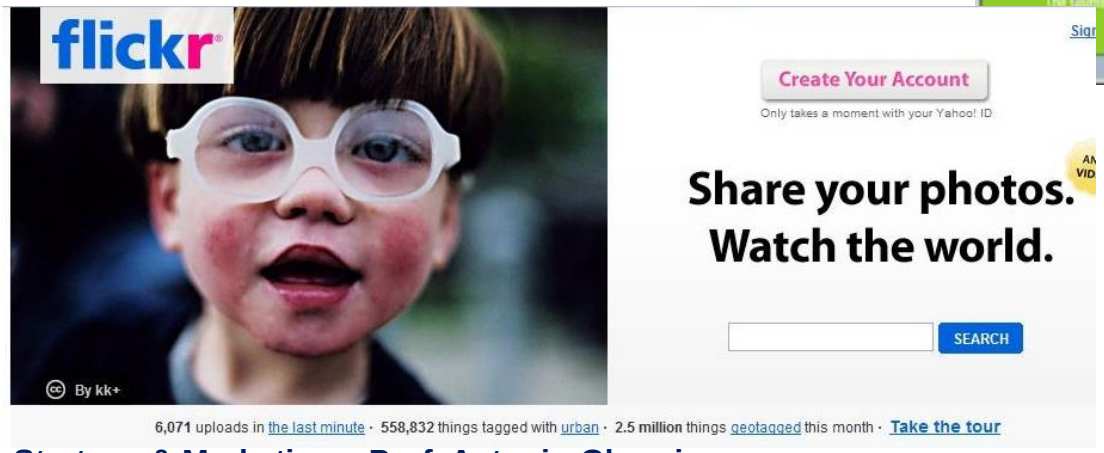
Instagram: it was a location based social network

Groupon: formerly, "The Point", site for online collective action and fundraising of collective actions (social media platform designed to get groups of people together to solve problems)

PIVOTING
Flickr

From a "massively multiplayer online role playing game" called Game Neverending….



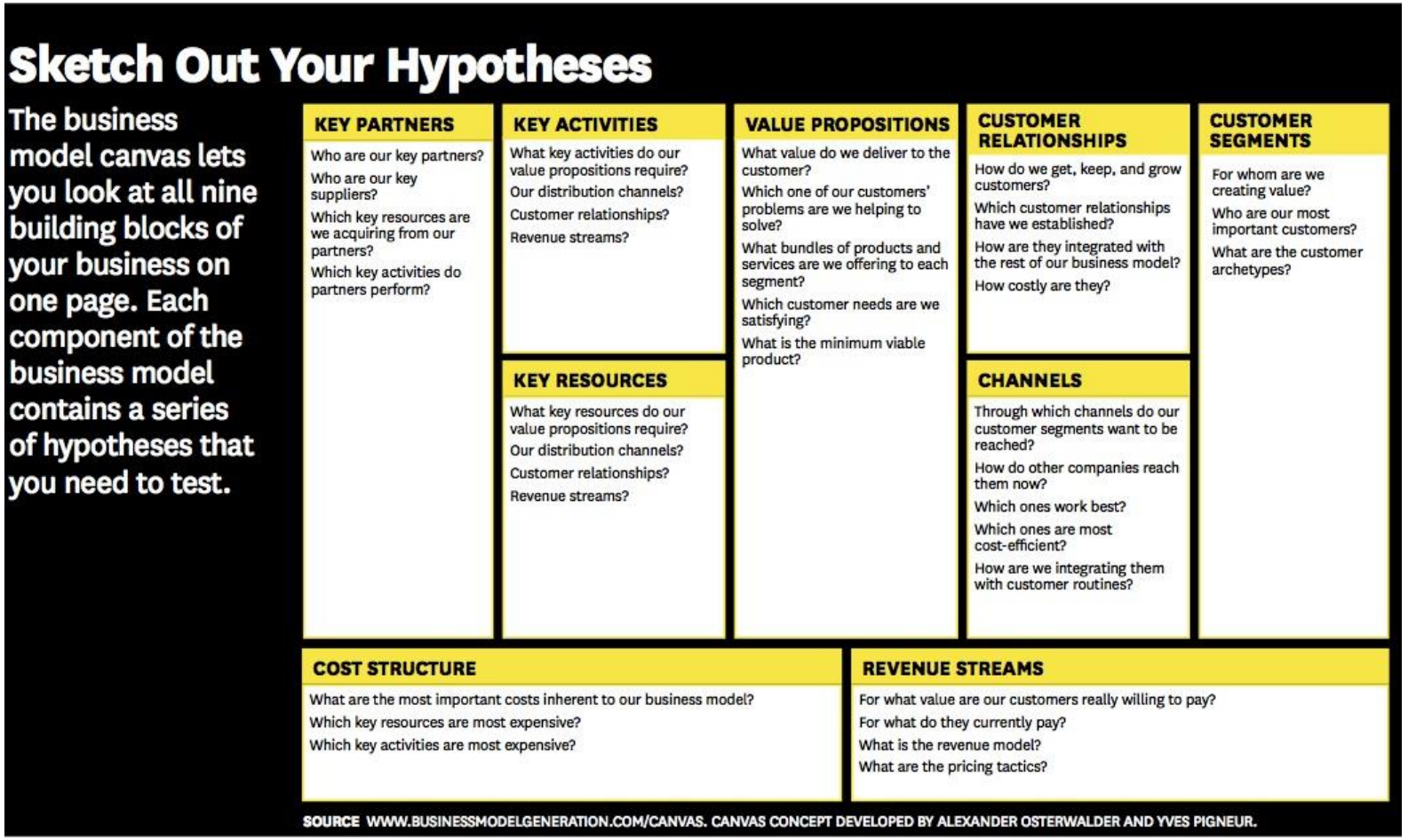


… to the larger potential of simplifying photo sharing on the web

Key principles of lean method (*Steve Blank, 2013 – HBR*)

1. Instead of writing an intricate business plan, summarize their hypotheses in a framework called Business Model Canvas
2. Use a «get out of the building» approach called Customer Development
3. Practice Agile Development

Business Model Canvas



Key principles of the lean method

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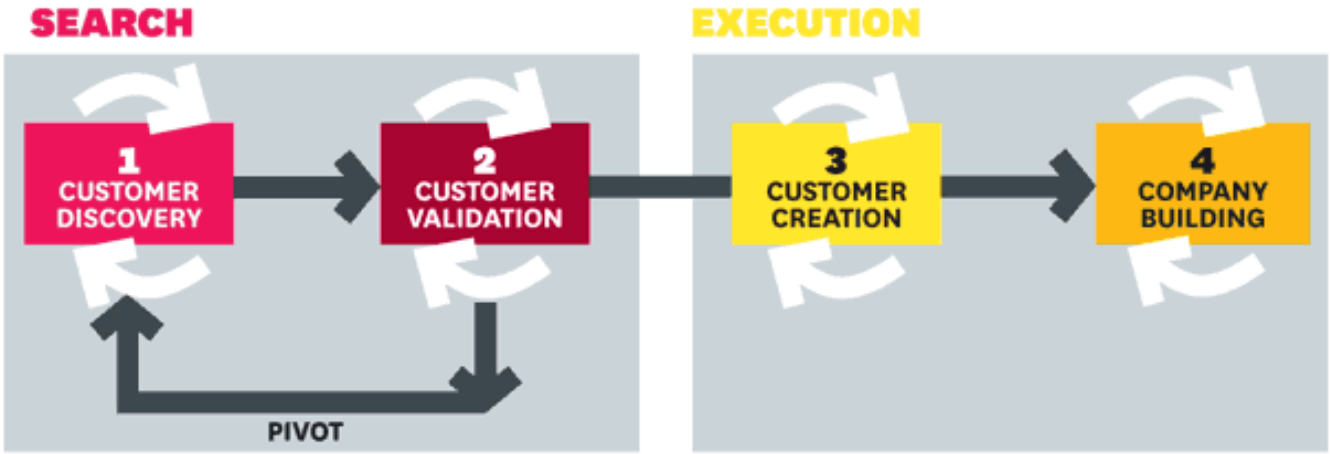
Listen to customers (1/3)

- SEARCH: Looking for a business model that works
  - If customer feedbacks are negative = wrong hyotheses
    PIVOTING
  - If customer feedbacks are positive = proven model
- EXECUTION: Building a formal organization



Listen to customers (2/3): *SEARCH*

1. CUSTOMER DISCOVERY –

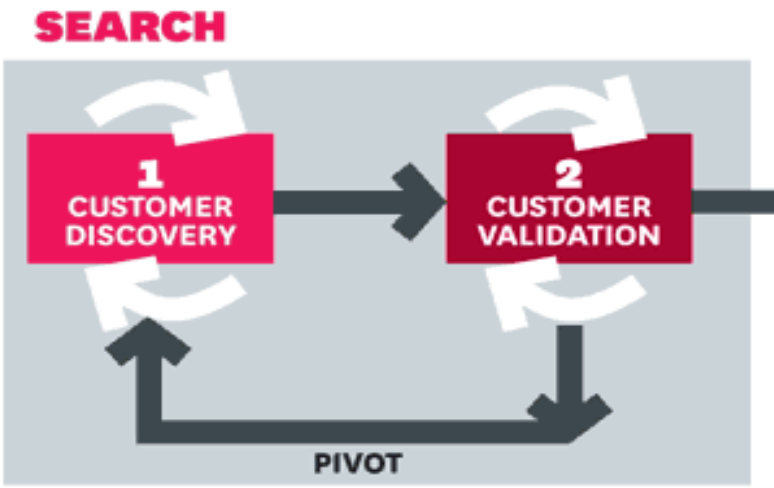
   Company ideas are translated into:

   a. *BM Hypothesis*
   b. *Test assumptions on customer needs*
   c. *Creation of a MVP*

2. CUSTOMER VALIDATION –

   Iterative process:

   a. *Test all hypotheses*
   b. *Validate customers' interest through early usage/orders*
   c. *Pivot (change in hypotheses)*



Listen to customers (3/3): *SEARCH*

3. CUSTOMER CREATION –

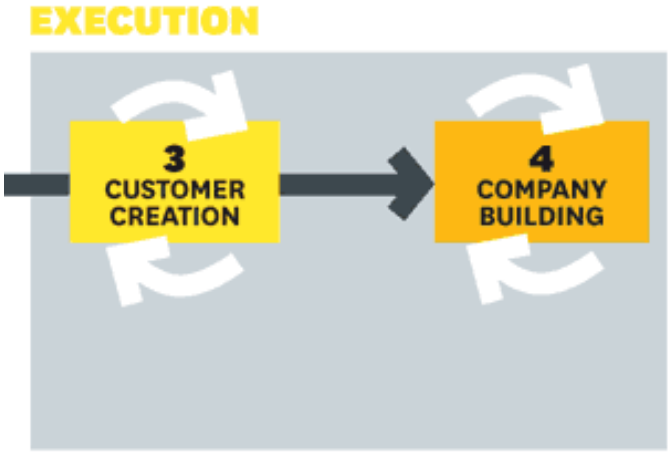
   The product is refined:

   a. *Demand building*
   b. *Marketing & sales spending*
   c. *Scaling up the business*

4. COMPANY BUILDING –

   Business transition from startup mode:

   a. *Customer development team*
   b. *Functional department*



Key principles of lean method

1. Instead of writing an intricate business plan, summarize their hypotheses in a framework called Business Model Canvas
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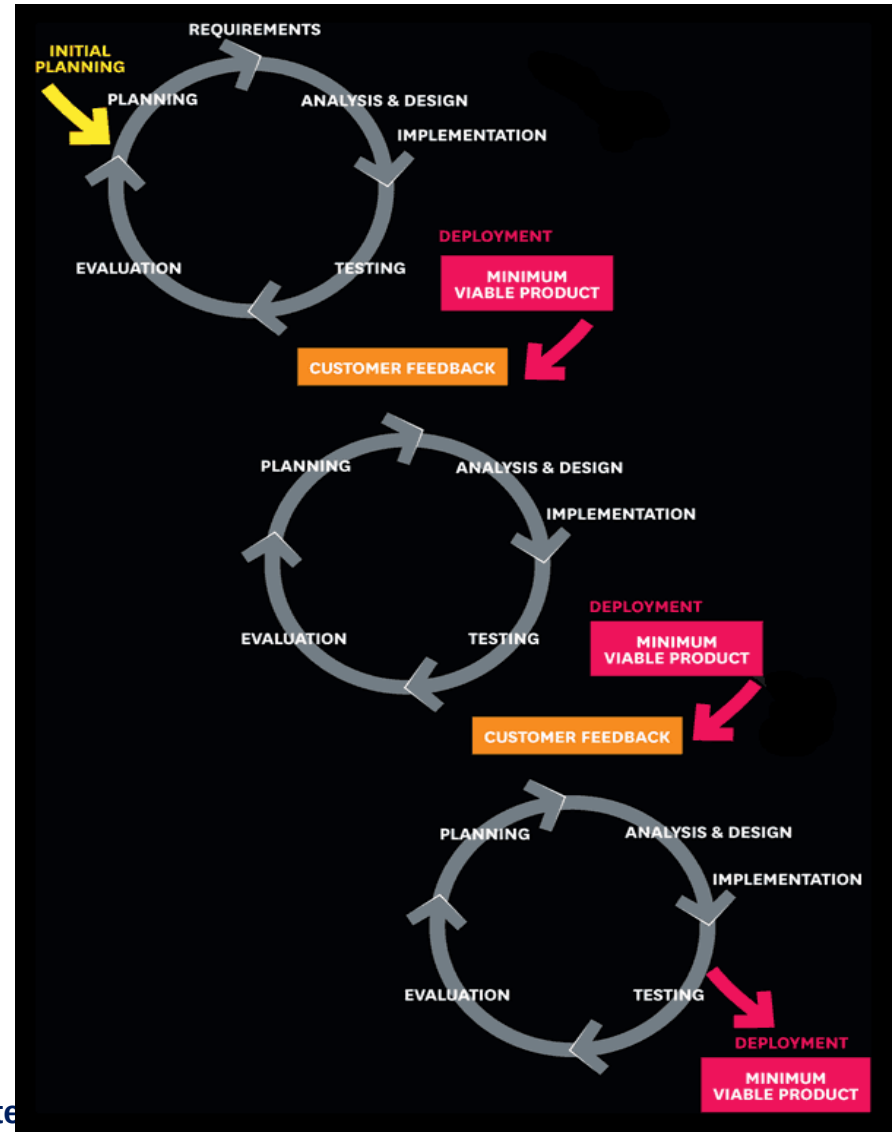
Quick responsive development



«In contrast to traditional product development in which each stage occurs in linear order and lasts for months, agile development builds product in short, repeated cycles. A start-up produces a ***Minimum Viable Product (MVP)*** *– containing only critical features – gathers feedback on it from customers, and then starts over with a revised MVP»*

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Lean Startup Approaches: theoretical roots and empirical findings

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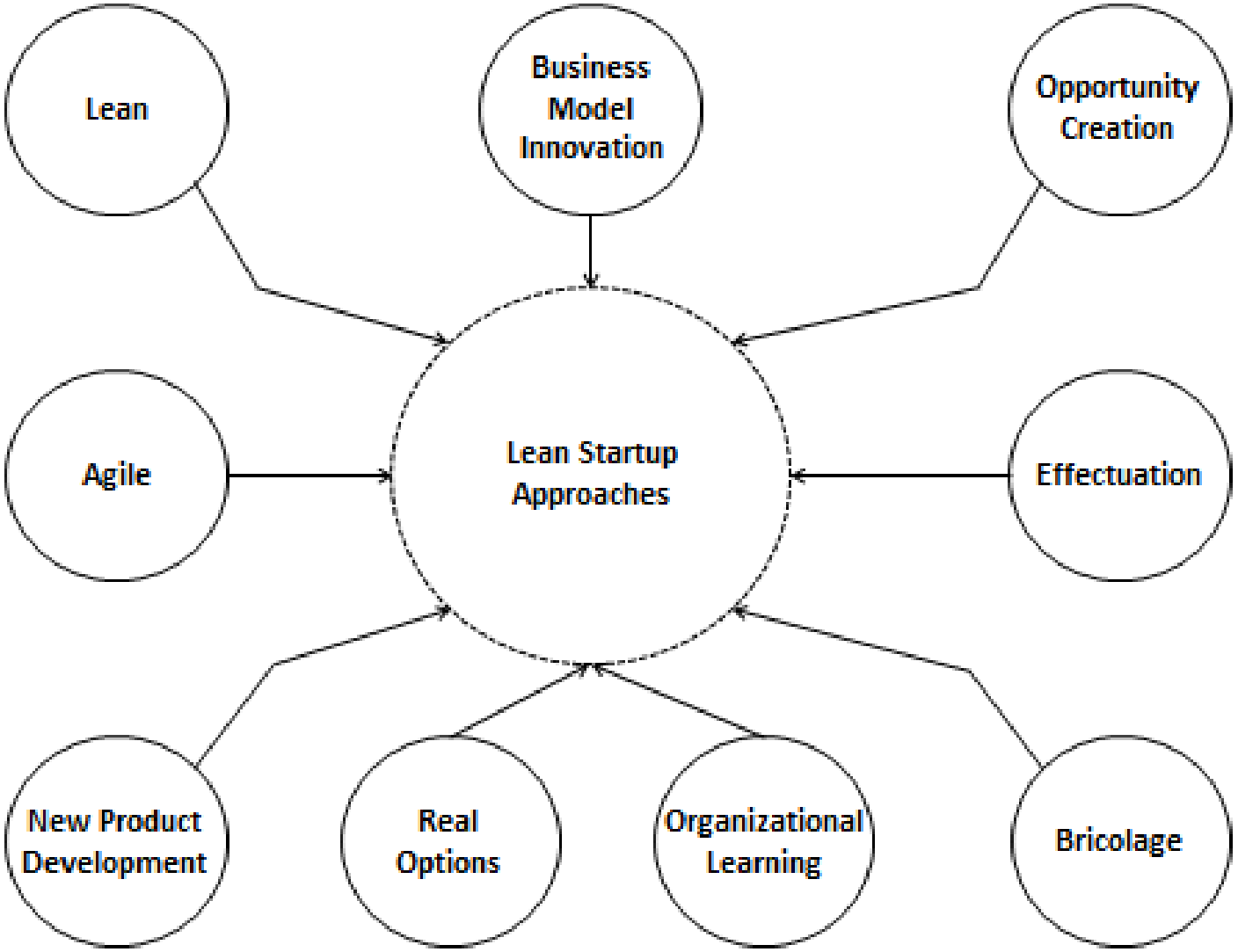
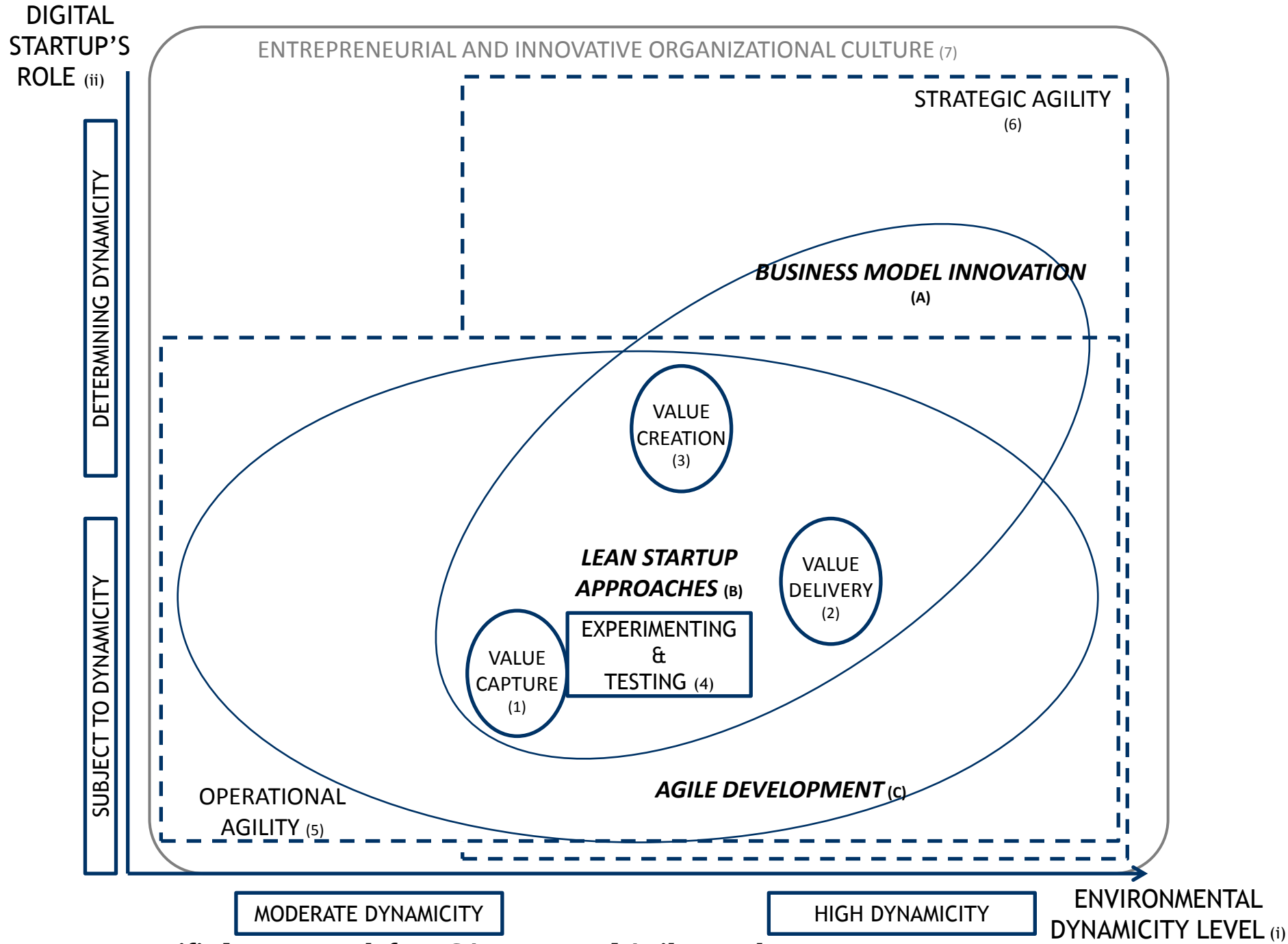
Lean Startup Approaches: theoretical roots (Ghezzi, 2018)





Unified Framework for LSAs, BMI and Agile Development *(Ghezzi and Cavallo, 2018)*

Empirical findings: practical guidelines for LSAs adoption (Ghezzi, 2018)

Issue	Practical Guidelines
Type of digital startup	• All startups, including those that are CVC-backed, benefit from adopting and implementing LSAs.
Stage of startup development	• Startups are to adopt LSAs in their early stages of development, while continuously implementing them following Agile principles whenever the context turns out to be uncertain.
Bad choices concerning the provision of LSA-related knowledge	• Startups are to carefully assess and select suppliers for LSAs courses and training sessions. • Startups are to rely on certified and experienced actors – e.g. universities, colleges and research institutions, top-ranked incubators and accelerators.

Empirical findings: practical guidelines for LSAs adoption (Ghezzi, 2018)

Issue	Practical Guidelines
Formulation of falsifiable hypotheses	• Entrepreneurs must think carefully on how they can accurately formulate falsifiable hypotheses about their startup's business model (a step they often neglect). • Falsifiable hypotheses constitute the operational trigger for the scientific methods embedded in LSAs.
Identification of earlyvangelists	• Entrepreneurs are to properly evaluate who their earlyvangelists and trial users are and where they "hang out", in order to target the right prospects and receive informed feedback. • In B2B settings, evangelists are found among existing business customers by carefully assessing the customers' purchasing processes and identifying the key decision-makers.

Empirical findings: practical guidelines for LSAs adoption (Ghezzi, 2018)

Issue	Practical Guidelines
MVP design	• MVPs are artefacts with these key characteristics: they (i) resemble and embody the business idea; (ii) are actionable; (iii) are measurable through the MVP testing outcomes; and (iv) are less wasteful than prototypes. • MVPs as paid-for products increase the amount of information they carry when tested upon. • MVP design can leverage Feature Development Design (FDD) to provide guidelines on how to identify and design minimum features and run iterations. • In B2B settings, an MVP cannot be too "minimum", as it should incorporate a sufficient number of features at a satisfactory level to compete with existing offers.

Empirical findings: practical guidelines for LSAs adoption (Ghezzi, 2018)

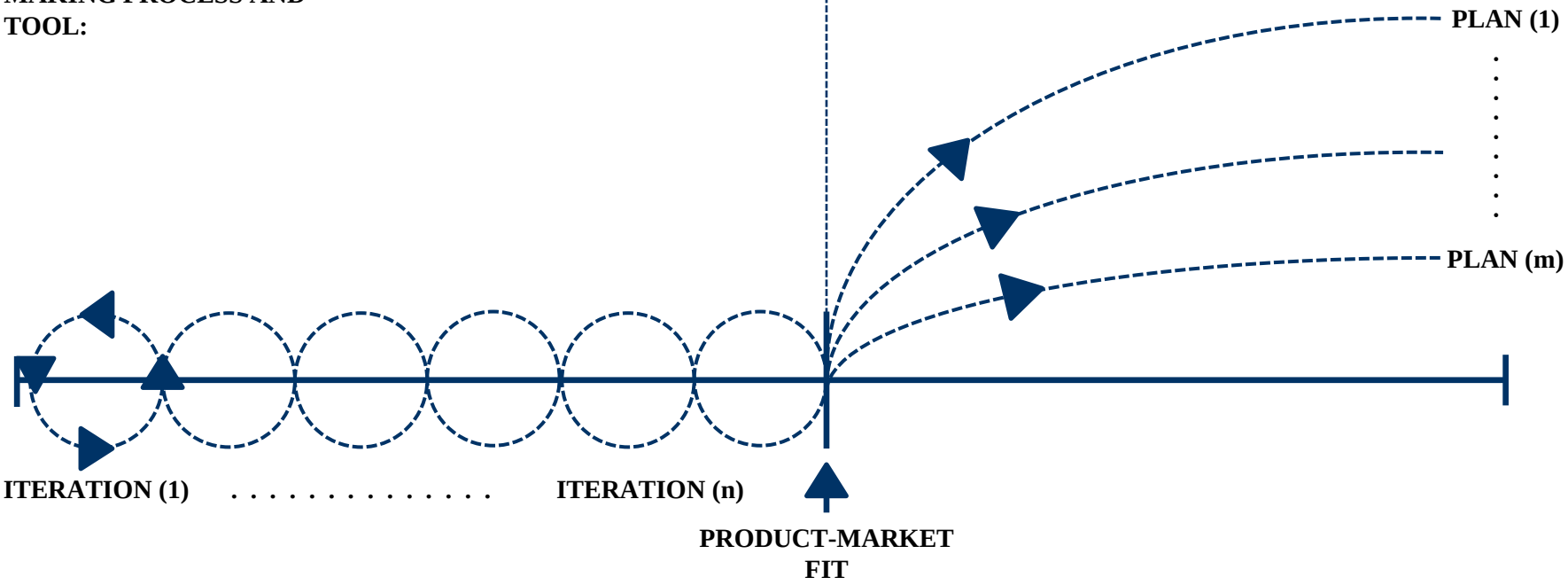
Issue	Practical Guidelines
Experimenting and testing	• Experiments are to be MVP-based, which in turn means they are BM-based. • Digital products and services can be run through Scrum sprint cycles, to control for time and budget. • Entrepreneurs are to radically rethink their views on IP protection, embracing openness and collaboration through fast experimenting and learning.
Business Model validation and pivoting	• Startups are to experiment and test on all elements of their business models, not just their value proposition (product, service, solution, bundle). • Executing a go-to-market strategy often requires more testing than the value proposition itself.

Empirical findings: practical guidelines for LSAs adoption (Ghezzi, 2018)

Issue	Practical Guidelines
LSA broad adoption and implementation process	• Entrepreneurs are to adopt LSAs comprehensively, rather than cherry-picking the steps and elements they perceive as most useful. • Entrepreneurs are to go beyond heuristics and apply a scientific method by means of the LSAs. • **Entrepreneurs are to integrate LSAs with business planning, thus altering Blank's motto to: "*before* writing a business plan, design a business model and apply LSAs"**. • Entrepreneurs are not to overlook the process of strategy formulation and strategy analysis which can inform the formulation of falsifiable hypotheses and design of a preliminary business model.

Bridging LSAs and Business Planning (Ghezzi, 2018)

ENTREPRENEURIAL OPPORTUNITY SETTING:	***Creation theory***	***Discovery theory***
UNDERLYING COGNITIVE LOGIC:	***Effectuation and Bricolage***	***Causation***
DECISION MAKING CONTEXT:	***Uncertain***	***Risky***
OPERATIONAL DECISION MAKING PROCESS AND TOOL:	***Lean Startup Approaches***	***Business Plan***



The entrepreneurial opportunity space

(Ghezzi, 2018. Digital startups and the adoption and implementation of Lean Startup Approaches: Effectuation, Bricolage and Opportunity Creation in practice. Technological Forecasting and Social Change. https://doi.org/10.1016/j.techfore.2018.09.017)

References

- Blank, S. (2006). *The Four Steps to the Epiphany: Successful Strategies for Products that Win*. Cafepress.com
- Blank, S. (2012). *Search versus Execute*. Retrieved from steveblank: http://steveblank.com/2012/03/05/search-versus-execute
- Blank, S. (2013). Why the lean start-up changes everything. Harvard Business Review, 91(5), 63-72.
- Blank, S., & Dorf, B. (2012). *The Startup Owner's Manual: The Step-By-Step Guide for Building a Great Company*. K&S Ranch Consulting
- Eisenmann, T., Ries, E., & Dillard, S. (2012). Hypothesis-Driven Entrepreneurship: The Lean Startup. *Harvard Business School*, pp. 1-23
- Ghezzi, A. (2018). Digital startups and the adoption and implementation of Lean Startup Approaches: Effectuation, Bricolage and Opportunity Creation in practice. Technological Forecasting & Social Change. https://www.researchgate.net/publication/327852445_Digital_startups_and_the_adoption_and_implementation_of_Lean_Startup_Approaches_Effectuation_Bricolage_and_Opportunity_Creation_in_practice
- Ghezzi, A., & Cavallo, A. (2018). Agile business model innovation in digital entrepreneurship: Lean Startup approaches. Journal of Business Research. https://www.researchgate.net/publication/325955069_Agile_Business_Model_Innovation_in_Digital_Entrepreneurship_Lean_Startup_Approaches
- Bortolini, R. F., Nogueira Cortimiglia, M., Danilevicz, A. D. M. F., & Ghezzi, A. (2018). Lean Startup: a comprehensive historical review. Management Decision. https://www.researchgate.net/publication/326960493_Lean_Startup_a_comprehensive_historical_review
- Ghezzi, A., Cavallaro, A., Balocco, R., Rangone, A. (2015). A comparative study on the impact of Business Model Design & Lean Startup Approach versus traditional Business Plan on Mobile Startups performance. In Proceedings of the 17th International Conference on Enterprise Information Systems (ICEIS 2015). Barcelona, Spain, April 27-30, 2015
- Nobel, C. (2011). Teaching a 'Lean Startup' Strategy. *Harvard Business School Work Knowledge*
- Ries, E. (2011). *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*. Crown Pub.
- Ries, E. (2012). *Lean Startup Principles*. Retrieved from The Lean Startup: http://theleanstartup.com/principles

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