Doing a Startup

## - A professor learns a bit how business works -

Luca de Alfaro

My trajectory

- Graduated from **Poli Torino**.
- Went to **Stanford** for PhD, fell in love with logic, formal methods.
- After a postdoc at UC Berkely, became professor at **UCSC**.
- Then proceeded to lose sanity:
  - Went from formal methods, to game theory; from there, to reputation systems and crowdsourcing, and from there…
  - 3 years at **Google** (Maps, Plus, Research)
  - Serious startup: **Camio** (2013+, co-founder)
  - Minor startup: Crowdgrader (2014+, founder, tiny/unimportant)
  - Now **back at UCSC**, still works (1 day/week) for Camio.

Essentially, a professor that has tripped and fallen into the startup world.

A Tour of The Bay Area…   and of the Talk
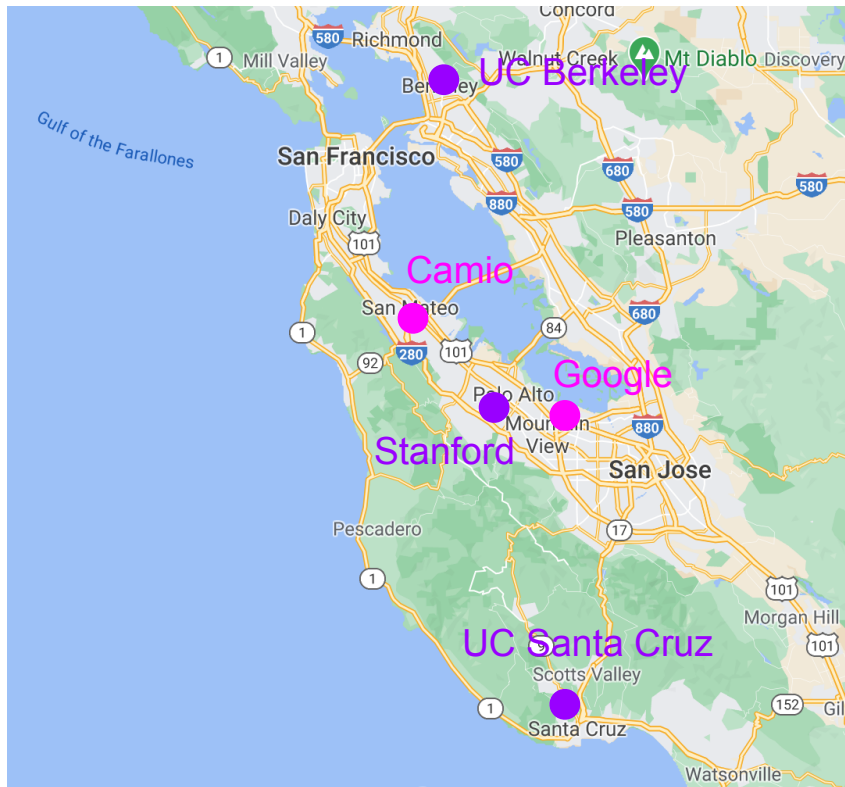
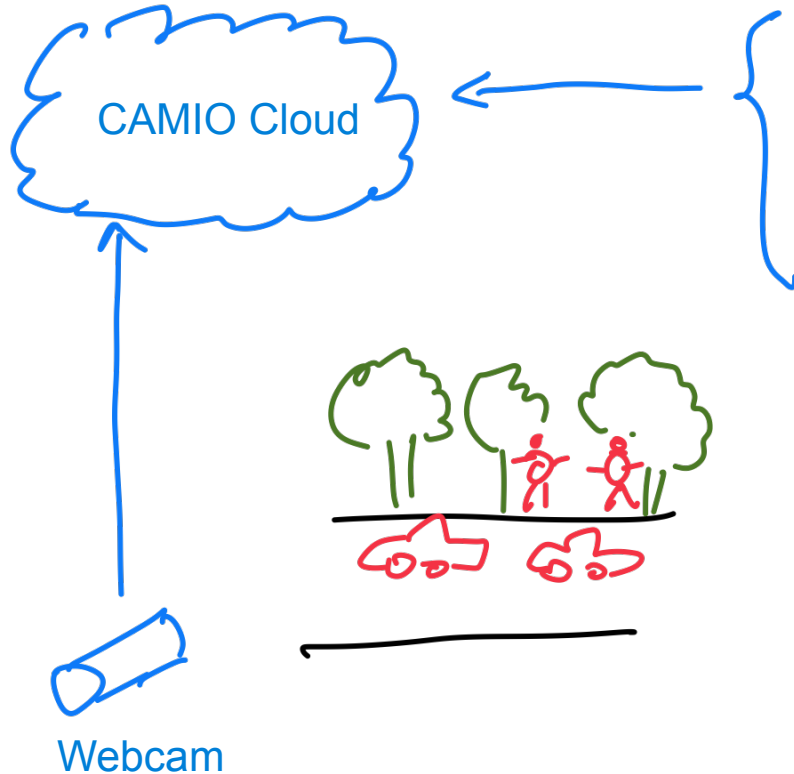Part I: A brief history of Camio

Part II: Lessons

- Product
- Monetization
- Startup life cycles
- Enabling factors
- Raising money
- Goals and interests
- Biz-dev and marketing
- Building a team
- Engineering

Part I

# A Brief History of Camio

Camio: Initial Vision

CAMIO Cloud

- Security
- Search
- Analytics
- …

Webcam

- Power the World's webcams!
- Make all video searchable and usable!
- Unlock the information in the video!

Camio: The initial uptake was slow

- We were targeting users = individuals
- Turns out, screwing webcams to walls is no fun
- Once acquired, customers stayed with us forever (very low loss ratio)
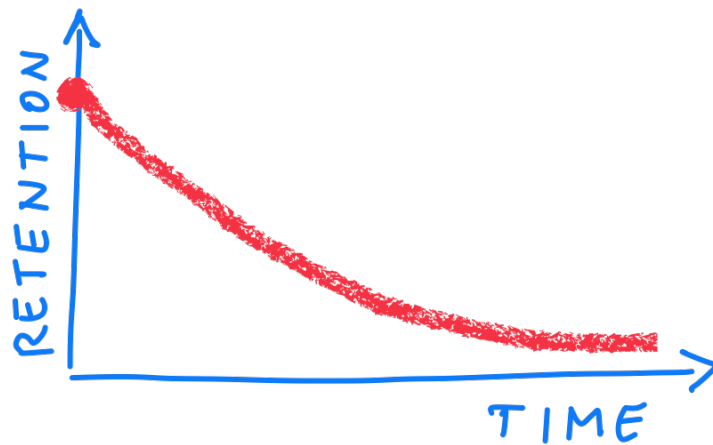- But, acquiring them was very slow; too slow.
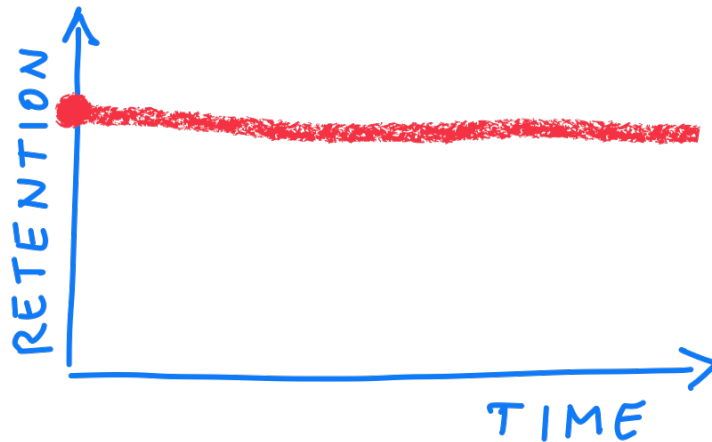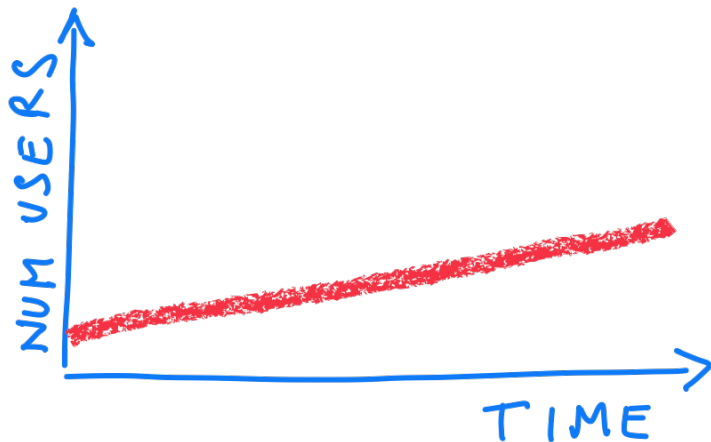
Pivot to Mobile!
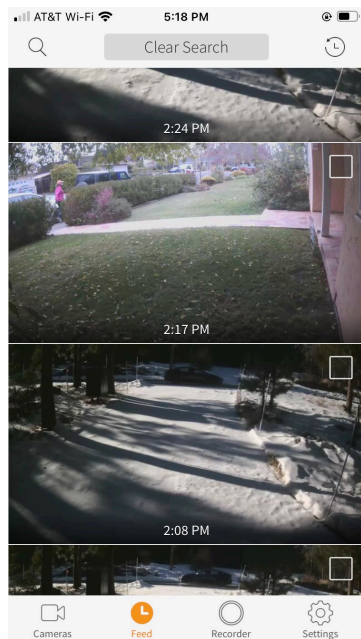
- Remember, this was 2014…

- Idea: write a single app:

  - On spare phones: webcam

  - On user phone: view the webcam

Mobile is not all roses…

Adoption was fast, but:

- Mobile: used to free
- High loss. Exponential loss of customers in time.

Crunch time. Money is low, some developers leave.
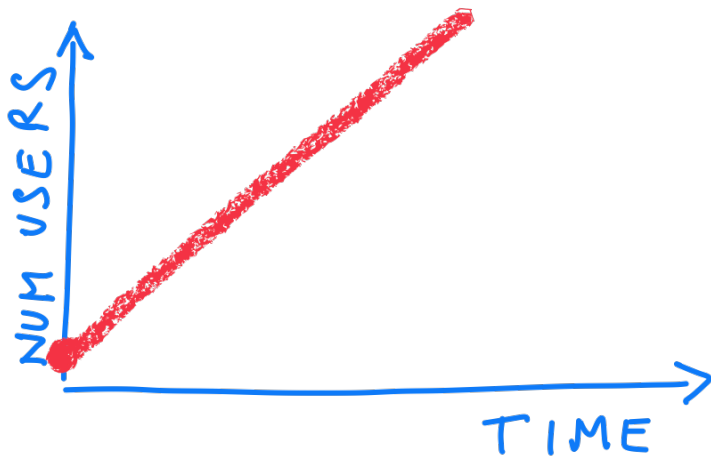
Pivot to box!

A CamioBox Prototype

Idea: create a box+camera that captures video, processes it locally with ML, uploads analytics:

● How many people pass?

● How many freezer door openings?

● …

+ We control everything,

+ ML cycles paid by customers not cloud

+ (business) customers just attach it somewhere and are up & running.

Box — but without camera

A CamioBox Prototype

Carter: *cameras evolve too fast. Let's just stick with a box that acquires video feeds.*

And the magic happened: A product companies want!

- Flexible (keep videos locally, upload, …)

- Cheap

- Pluggable analytics (own ML + integration with services)

- Works on installed cameras

- Integrations (OpenPath, social distancing, …)

- —> Camio achieves **Product Market Fit** (the Holy Grail)

Part II

Some Lessons

Products

It's OK to compete with giants

- Giants have enormous power to:
    - Develop great things
    - Advertise them
    - Use their main revenue source to pour enormous amount of money into a product at a loss, to conquer a product area.
- BUT:
    - They also tend to develop one-size-fits-all solutions
    - Not always listen to their customers
    - Not always flexible.
- Surprisingly, there is space for smaller players via dedicated products.

It's OK to compete with giants

Examples:

- Google Drive, but there is also Dropbox, Box, Zoho, …
- GMail, but there is also SendGrid, FastMail, …
- AWS, but there is also Rackspace, DigitalOcean, …
- Ring, Nest, but there is also… Camio!

The TiVo Trap

- You think it's easy to sell a product based on an entirely new idea, something that's completely different from current products?
  - TiVo: a video-recorder that's at an altogether level of smartness: tracks shows, records them, organizes them for you…
  - Camio: makes video searchable, intelligence out of video…

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    - TiVo: a video-recorder that's at an altogether level of smartness: tracks shows, records them, organizes them for you…
    - Camio: makes video searchable, intelligence out of video…
- **The trap:**
    - If the product is too original, people don't know it exists, don't know they have a need for it, don't search for it.
    - *It is incredibly difficult to raise awareness for a new class of products. It's easier to follow in the wake of other successful products.*

The polished stones analogy

- Enormous value in listening to customers and iterating
  - Both for Camio and CrowdGrader!

B-to-C vs B-to-B

- Business to Consumer:
    - Marketing is harder
    - Monetization can be harder
    - Need more VC capital
    - But, you can achieve larger scale, perhaps

- Business to Business:
    - Easier to sustain company on fewer bigger deals
    - May be more limited in growth (but: Salesforce, Shopify, …)
    - Less VC capital
    - Different marketing

On some markets

- **Education**: lots of work in sales, compliance, lawyers, …

- **Mobile**: difficult to monetize initially, takes great skill

    - But: GaiaGPS, Sibley Birds, …

- **Hardware**: Hardware can be easy, it is *nice* hardware that's hard. Design, perfection. Large capital to do the equivalent of a Nest Cam (injection molds, …). But all of it can be outsourced given capital.

Random advice

- It's easier to entertain people than to make something useful.
- Making and selling something useful can take long, be boring.
- But entertainment can be short lived.

- **Social Responsibility** (you are creating part of the future)

- **<u>Key advantage:</u>** a CS person + someone with domain expertise (wineries, agriculture, medicine, ...) + knowledge of the customers.

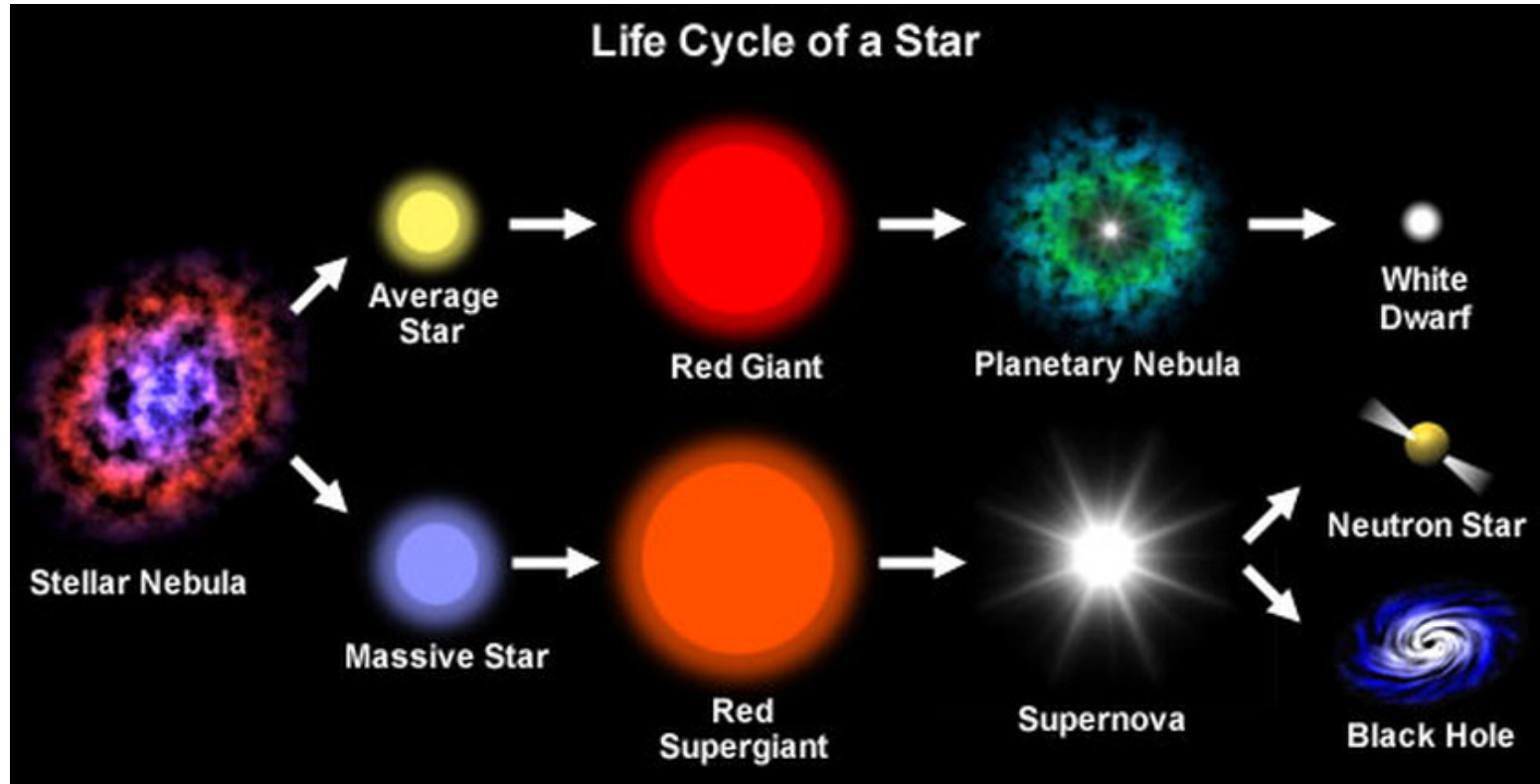# The Holy Grail: Product-Market Fit

- When you have it, the product flies out of the door.

  - You sell to customers that are already sold to it.

  - Customers talk to each other and do the selling for you.

  - Your problem shifts from getting customers to know & try you, to keeping them happy.

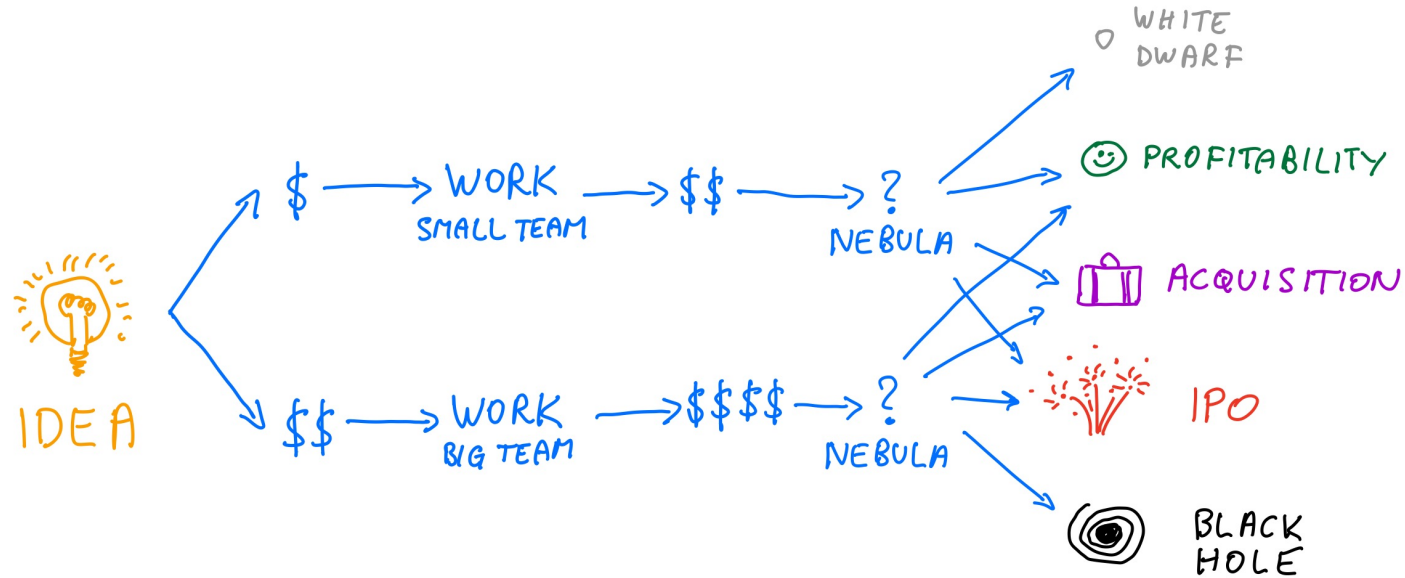*"That incredible woosh sound when the product is sucked out of the door"*

Startup Paths

Star Paths …

… and Startup Paths

… and Startup Paths
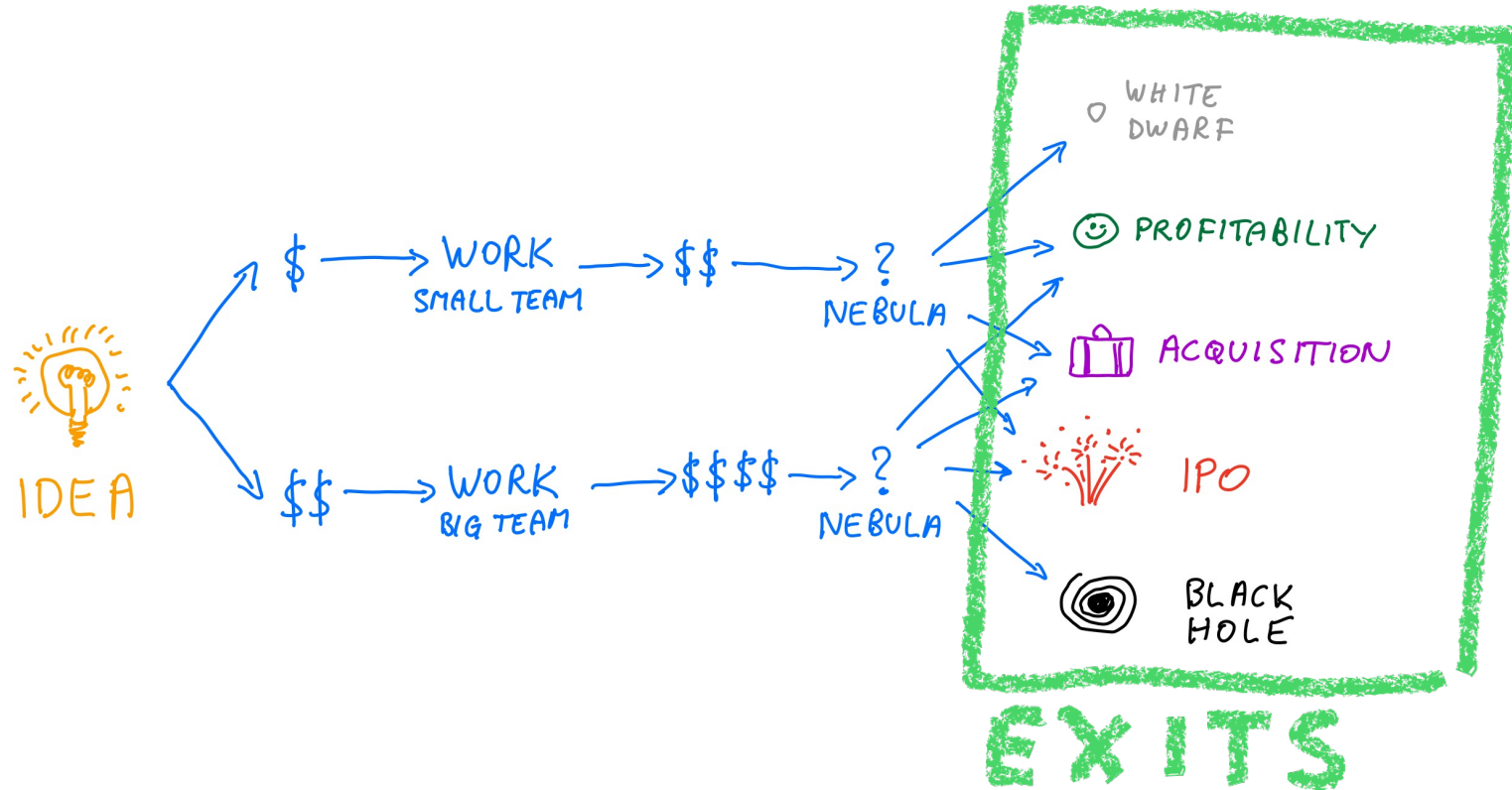
Enabling factors - starting side

On the **starting** side:

- People with **skills**
- People with **ideas**
- Willingness to take **risks**
  - … and social **acceptance** of failure!
- **Capital**
  - … and a willingness to invest it.

Enabling factors - exit side

On the **exit** side:

- **Large companies that acquire** and pay a premium for technology
  - Acquihires don't matter

- **IPO Market.**

- **Profitability.**

If these don't exist…
- Move to a place where they do.
- Or, accept much lower reward.

The acquisition exit

- Companies buy to:
    - Quench competition
    - Acquire talent (and deprive competitors of it)
    - Acquire technology that it would have been difficult to do in house.

- About the latter:
    - Innovation starts from below (simpler, cheaper, that gets better)
    - Difficult for a >1B company to nurture a group with 1M revenues

The IPO exit

- If you get there, you will get better advice than mine.
- Road show, you get investors to commit to buy the initial shares for some price.
- This initial price is lower than the immediate market price after IPO hopefully.
- So initial road-show investors capture a large share of the value of the IPO.
- … but, you can sell more stock later.

Raising Money

"I rob banks, because that's where the money is"

Quote improperly attributed to Willie Sutton.

He actually robbed banks much for the reason you might do a startup: because he loved the excitement of it.

Rounds and Sources
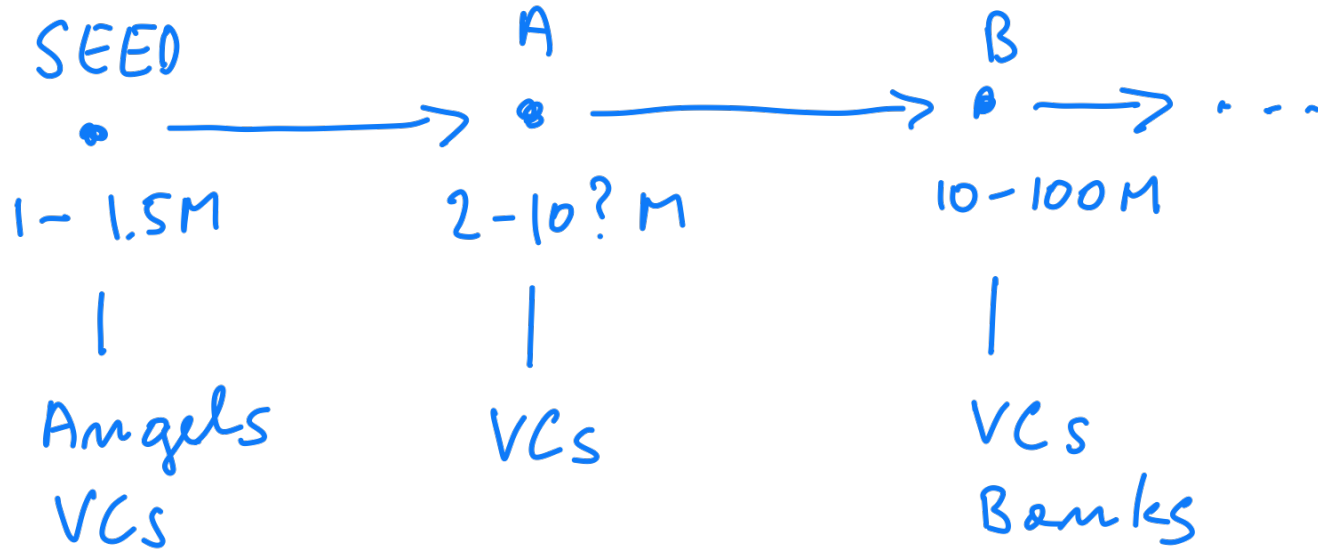
Sources

- Angels ("seed round", perhaps up to 1-1.5M)
- Venture Capital (VCs), seed round and rounds A, B, …
- Banks, via:
  - Their VC arm (similar to other VCs)
  - Loans (typically to fund production, marketing, … once the product & sales are there).

Before a Round: Incorporation

- Before you can raise a round, you need to incorporate as a company. In the US:
    - **C-Corp:** Has shares, anyone can own them. You decide where to incorporate (Delaware?). Losses are recorded on the books.
    - **S-Corp:** Like C-corp, but limited to US persons; you can deduct losses.
    - **LLC:** For small stuff. No shares.
- **Shares:** percentages of ownership. They go to:
    - Founder(s)
    - Advisors. It's very good to have advisors (like, godfathers). 0.5-1% each.
- **Board:** You also need a board. It can have tremendous utility. Get a great business lawyer on it.

A funding round

- **Round:** You give away a share of your company in exchange for money.
- **Valuation:** How much do you get for which share of the company? It depends on the valuation.
    - Example: if the company is valued at 4M, if you give away 20% you can get 1M (1M is 20% of the resulting 5M company).
    - The valuation is decided by a lawyer according to a process:
        - You count the time invested, how much it would cost to replicate, sales, patent value, etc.
- **Shares:** usually, investors get "privileged shares", who get their money first in case of bankruptcy.
- Often you also "sell" the ability to participate in a minimum share of following rounds.

Raising between rounds

- You can also raise money between rounds.
- You get money in exchange of the ability to *participate in the next round at a discount.*
    - The discount is because you ask them for money before the round.
- Technically, the instrument is a *convertible note:* a note of debt that is later convertible in shares.
- Typically, convertible notes also contain a condition by which the purchaser is assured the ability to participate in the next round with a given percentage.

The mechanics of raising money

- **A presentation (~15 slides).**
  - Team
  - Product
  - Advantages (why us, why difficult to replicate)
  - The market (any initial customer data) — the more data the better
  - The more successful startup create smoke — *reality distortion circle*
- **The team is very important.**
- **Create a sense of urgency**
  - Get multiple bidders
  - Force a strict timeline on closing
  - Remember, everybody (including VCs) loves a bargain.

Incentives are different for VCs and for you.

- You want **your company** to make it
- VCs want to **maximize their ROI**
- The two are different.

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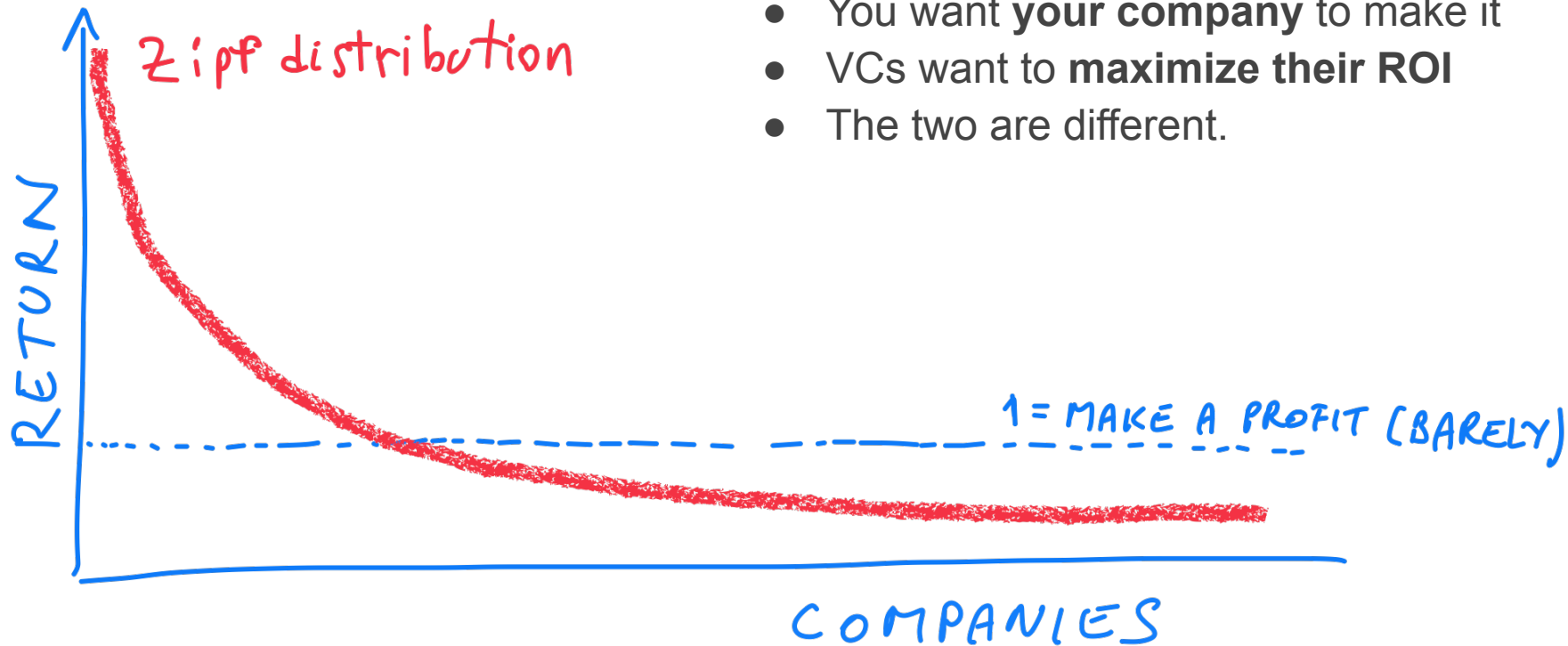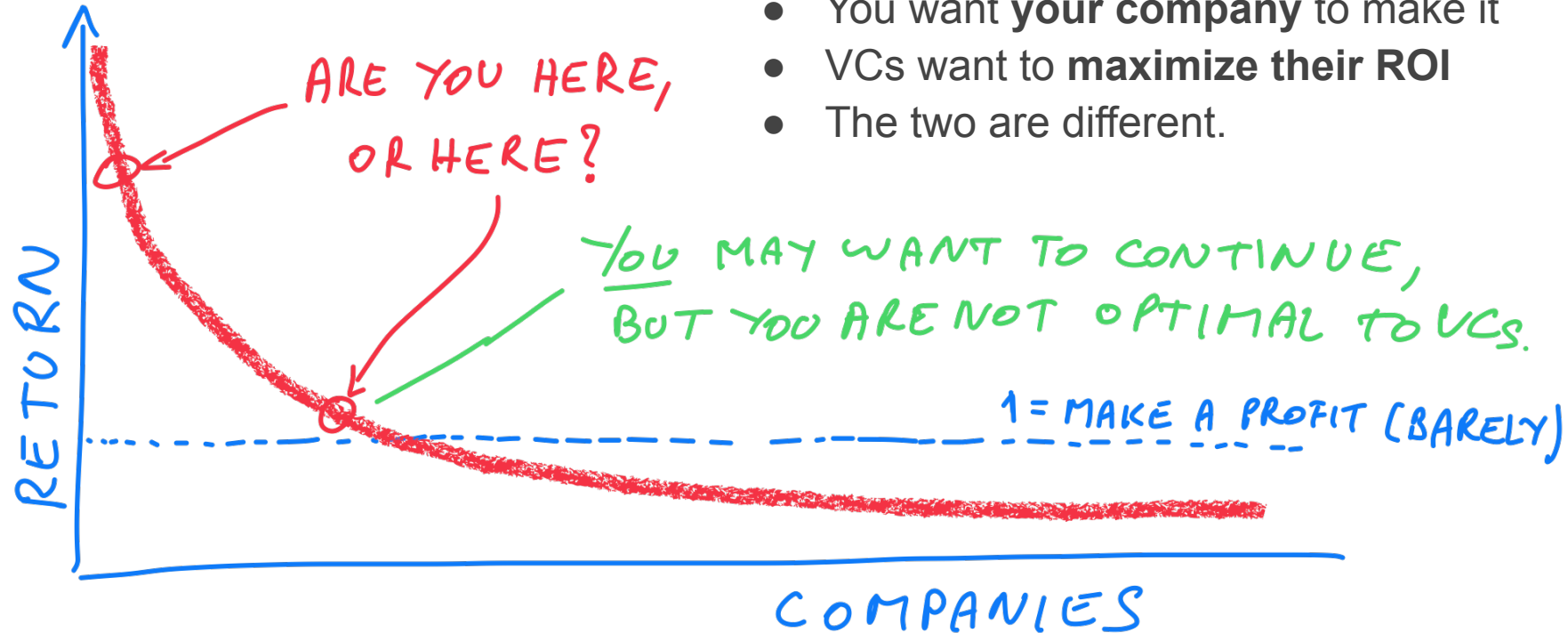
Corollaries

- VCs have company portfolios, the way horse breeders have horses.
  - Some are for racing and will be well fed, others will be eaten.
- **"*Fail Fast"*** — it is a VCs mantra, but is it good for you?
- Beware of incubator "farms" — they are a way for VCs to spread risk
  - But what is in it for you? Access to services, connections, the ability to jump on the next thing.
- **VCs love to keep you on a leash:** give you enough money for 1.5 years, ask you to spend in that interval.
  - Too much money is like too much hay, it can blow you up.

- **The holy grail:** committed, long-term investors that understand the market and have faith in the team.

Advertising, BizDev, Marketing

Advertising

You have a product. Now you need to sell it.

Advertising:
- Until you attain product-market-fit, advertising doesn't buy you much.
- After you attain product-market-fit, you don't need it much

How to advertise?
- Digital marketing: you pay most of the value of a new customer.
- Traditional (TV, …): expensive!
- Radios, blogs, …
- *Trade shows, industry newsletters, distributors, …*

Advertising is one area where the big ones have a huge advantage on you.

Business Development

- Understand the channel
- Understand *where* the value is in the channel
- Provide incentives to all involved, but …
- … retain contact with customer, to know:
    - product needs
    - improvements
    - competitors
    - price flexibility
    - … and be able to "grind the stones"

Target… and advice

- Remember Willie Sutton: target rich people, because that's where the money is.
    - But also, target developing countries, if you know their real needs, because that's where the expansion is.

- **Charge enough to make it interesting.** Don't make my mistake with CrowdGrader. Charge enough so that it is sufficiently profitable for you to continue development and investing. You do nobody a favor by having to abandon a product.

Monetization

Cash flow is KING

- Many things are flexible. Many things in engineering are flexible.
- Money is not. Zero is a *very hard* boundary.

- Corollary: can you think of things that generate *a better cash position,* even if other things stay the same (total long-term expected revenue, etc)?
- **Do *not* do things that worsen your cash position** unless you have gazillions of cash
    - Do not extend payment terms
    - Do not bill late
    - …
- Leave it to cash-rich banks to loan money.

Revenue types

- One-time revenue (purchase of product).
    - Problem: can you sustain the company on new purchases?
- Recurrent revenue
    - A potentially more stable basis on which to build.

- BUT:
    - Surprisingly, many companies prefer to pay as a lump sum recurrent revenues for 1+ years, because it might be easier for them to approve expenses than recurrent billing (and many sources of one-time money).
    - This gives you an opportunity to use advance revenue from some customers to fund development and acquisition of more customers.
    - Berkshire Hathaway was funded on the cash flow of an insurance company

Building A Team

Roles

- **CEO** (try to get the CEO to do CEO-ish things, like raising money, talking to customers, selling, *not* coding)
- **Engineers**
- **Customer success engineers** (better if separate from engineers)
- **Marketing/Bizdev,**
- **Sales,** but only once you have a proven, replicable, sales process; *not* before.

Building a team

- Interview for technical ability (for whichever field), and also:
- Ask open-ended questions (recognize talent in every form)
- **Company fit:**
  - Humble, cooperative, helpful, listens, easy to work with, integrity.
  - Diversity, not necessarily in the US sense, but in a real sense.
- No high-maintenance egos.
- People have to be willing to do a bit of everything, including lowly tasks such as keeping stuff running, fixing bugs, etc.
- A top developer is paid 3x and produces 10x.
- You can outsource, but not the crucial stuff.
- Hire with parsimony, but have a bit of redundancy (people leave).

Motivate!!

- Communicate the vision
- Lead by example
- Always be friendly
- Take care of the people
- Think about performance reviews.
- Remember: not everybody has as thick a skin as you do:
  - Give praise, motivation
  - Don't assume they automatically feel part of the team

For you, as the leader

- Keep the faith
- Remain open and self-critical, and able to pivot
- Be very dedicated

Employee compensation

- Two components:
  - Salary (mid-range, not great)
  - Stock options, which typically vest on a 4-year schedule:
    - wait one year for first 25% to vest
    - then, vesting monthly.

- Problem: stock is worthless unless somebody buys it.
- Need to wait for an exit for it to be worth something.
- How to keep employees happy in the meantime?
  - Private share market
  - …
  - but, difficult.

Remember

- The *incredible* advantage in being nice, friendly, and a great person.
    - Friendly
    - Collaborative
    - Give credit to whom it's due
    - Reliable

Engineering

Some random engineering advice

- Goal: achieve as much as you can with as few people as you can
  - Embrace the cloud (you don't want to keep stuff running)
    - ... but cloud ML is 10x$ of local ML
  - Automate as much as you can (Appengine, Google Cloud Compute, ...)
  - Don't get to be an SRE
  - Mind the UI
  - Review the code
  - Remember the anecdote about polishing stones? You will do it a lot
  - Think: build scaling in it from the beginning, or add scaling later on?

What to build

- We made the mistake early on to build things just because customers were asking for it.
- Later: if someone asks,
    - If it was already on the roadmap, BUILD
    - If it was already on a conceivable roadmap < 1 year, and *customers pays in advance:* BUILD
    - Otherwise, stall.
- *Asking for money early:*
    - Great proof of real interest
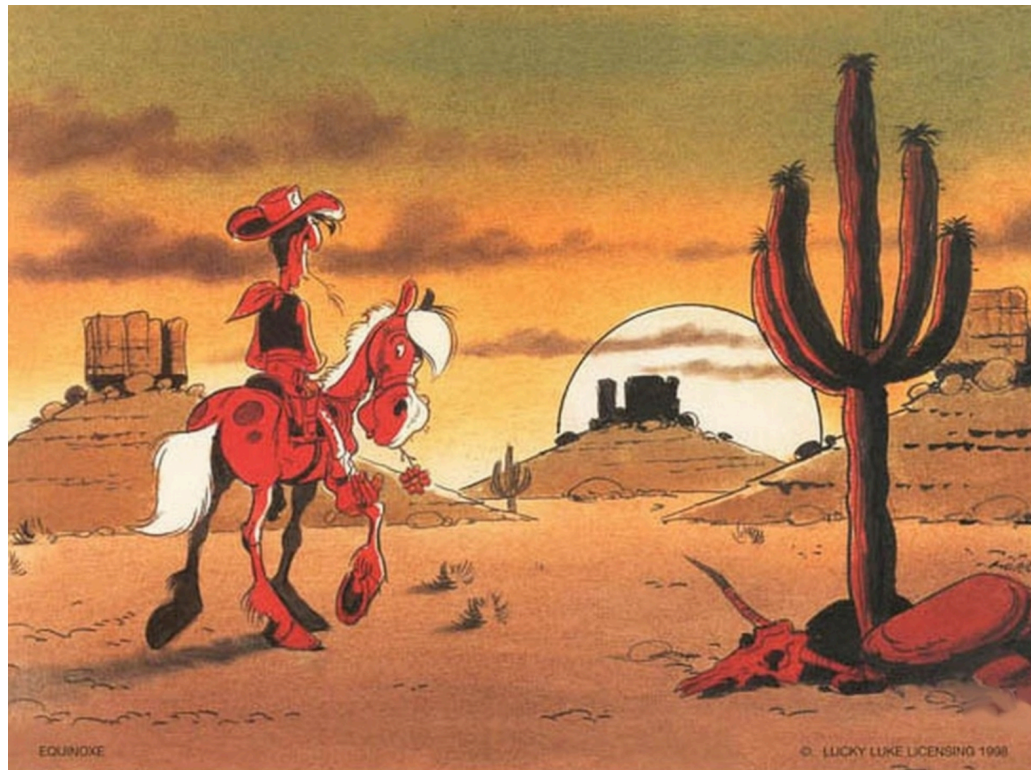   - Can fund advance development

What do you want to build?

- Research: because you hope to be acquired.
- Products: because you want to be acquired, or revenue.
- Conquer a market barely holding on it, because you hope you will be acquired for the market (or get funding) and be able to then build the real infrastructure to hold it.

Mental Health

Doing a startup is like a 10-year marathon

- It can be draining
- It will take years
- Everybody will look at you for motivation
- All the difficult decisions will be up to you
- You have to radiate being the company for all that time
- Make sure that you either don't care about having a life, or have a very happy life otherwise.
- Seek balance in life.
- Seek advisors that have already done some startup.

THE END