Provocative truth telling about startup and entrepreneurship, from an engineer's execution perspective.

Foundations of entrepreenruship for engineer

Journeys, lifes, and costs of being extraordinary

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Contents

Major theme:

1. Start early. Learn mindset. Take opportunity. Go deep.
2. Marketing and distribution costs more than making.
3. Cost control and scaling makes you number one, and only number one makes money.
4. There is limited business, but infinite varieties.
5. People don't care about kind problem solving. Problems will be solved, when it is bad enough. Don't try to solve a problem. Stay with your day job.
6. Eventually entrepreneurship is power. Engineers with no business experience will have lower career expectation.
7. Business and your job is not common. Never do startup for money. It takes money.

Challenges for smart engineers

Lecture 1: About this course

Good engineers are rare. It would be amazing if they could all build their own business and make their impacts. Sadly, this is not the case. Engineering schools curricula teach no business or business sense. This course teaches engineers to become effective entrepreneurs and understand the logic of business. When engineers only know engineering, their career potentials will be undermined. The course is given by Dr. Chang Liu, an engineer with a PhD degree in engineering from the California Institute of Technology. The teacher has been a tenured professor, an industry engineer insider, and startup CEO. He will discuss various aspects of entrepreneurship with a straight clarity. He teaches passionately from direct personal experience and success. The topics cover product making, product marketing, investor relations, and power idea moves veterans use to attract big investments. This book is written holistically. It is made by an engineer to millions of future engineers. Come join us, and change your life. With this course, you will become leaders, managers, founders instead of just engineers in any organization.

Lecture 2: Outline

This class is for you if one of these applies to you.

1. You are an engineer who never worked on product development.
2. You are an engineer who never worked in business department of a company.
3. You are an engineer who never managed a lot of people, for example 30 on a daily basis.
4. You are an engineer who never started a business.
5. You are an engineer carrying too much pride, ego, stigma, fallacy, and bad information. For example, if you think industry and business is common, then we are talking about you.
6. You are an engineer who never left the comfort zone before. You have always been in school, academia, or R&D. In a comfort zone you conform to written rules. In entrepreneurship you challenge and bend rules.
7. You are an engineer who never sold anything yet.

Here is an outline of this course. In this class we will do the following:

First we will identify the noise and fallacy. The self awareness of not knowing something is critical.

We will discuss the real process of entrepreneurship, for engineers;

Then we will discuss the real work an entrepreneur is expected to do;

Next, we will discuss essentials of how business work, for engineers;

We finish off by discussing power ideas and elements of business plan to increase efficacy of thinking.

Even if you don't start a business, this course is still important supplement to your formal engineering centric training. Two reasons it is important for engineers to be entrepreneurs.

First, it is important for engineers to learn business. The best way to learn business is to run one yourself. In fact, it is the only way. Engineering serves to build business, not the other way around.

It is unconventional career path vs. career ladder climbing.

If you succeed at a startup, you will have a first pot of gold to give you freedom, or parachute into a big company that buys you as a manager. It is cool.

It is for career, not money. Doing entrepreneurship and startup will not get you rich. Winning will. If you do it for money, or for being a boss, or for getting yourself income, it is like trying to play basketball to make money.

This class is the sore missing business class every engineering school should have taught. As an engineering school professor, I am amazed how little business we teach.

Please note this course is only the first pass, meant to motivate you to stop thinking and start building.

Many engineers know that entrepreneurship has risks. However, no one has encountered the risks before, only vaguely heard about these. The natural reaction ranges from denial to ignoring.

Fair warning, here are some of the risks.

Your idea never become a product, for many reasons.

There is simply no demand for your idea. People's reaction is "who cares", even if your solution is to save their lives.

You run out of funds before break even, and cannot scale, improve, or advertise.

Some even got lucky and succeed initially. However, they got stuck with no growth potential.

The business is profitable but no growth. Or, the business has revenue but no profit.

Second to last risk, you are beat by competition.

One last risk is a compromised life. Because you took the risk without knowing the risk, you are cast out by society work force. Your resume is forever ruined. This can be very brutal for smart engineers. I have met many such cases. Everyone from great schools.

Only rule in business is to bend rules. But you must first know the rules.

You might ask, if there are so much risk, why is it then important to take the risks?

Many people take the risk because they don't know. Or don't believe the preaching from veterans. They underestimate such risks. The natural thinking is, "I am great. Rules don't apply to me."

Ironically, people with a lot of money and capital can take less risk. You see for example Microsoft buying ChatGPT in 2023 at a later stage of that company's life, when the risks have been scouted out. For people without capital and family old money, the only way to compensate is to take on risky projects.

You see, taking a risk is not taking a chance. You take a chance when the risk is unknown. Capital do not take chance. They only take risks by spending a lot of money. Capital only gamble on informed risks.

There is a saying of "High risk, high return", but it is only true to a certain extent. Most entrepreneurs must risk on ideas that venture investors and banks will consider too risky. This is how to beat others, but your losing is almost certain.

L3 Are entrepreneurs born or made?

People ask, "Are entrepreneurs born or made". This is a sheepish way of asking "am I smart enough?". This is a wrong question.

Are you creative enough? are you smart enough? I bet you are.

What makes everyone else different from Elon Musk is not the smart. If super smart people succeed at entrepreneurship, Einstein should have a company but Edison, who never went to school for a day, should not.

Every person is capable, but most don't. Why?

1. Human society produced vast comfort zone and school system. To be one you must willingly break that bond.

2. Every entrepreneur is already made, but you must teach yourself. No one can make you or teach you. Never wait for that.

3. Human success is a relative term. You must beat the second place winner to be called success.

Everyone can start a business, just like everyone can walk, ride bicycle, and swim. However, you must teach yourself. All the learning involves quick succession of failures, and that is how you learn. It is OK to fail. You must fail. The failures reconfigures your brain circuits called a mindset.

For entrepreneurship you must learn in live fire drill. No schools or startup schools can simulate the conditions. As Einstein says, you only learn how to ride a bicycle when it is moving.

You are smart enough, and your idea is good enough. You just need to trust that, and let yourself fall a few times.

Everyone is born with instincts. Instincts of competition and survival. But you must teach yourself through painful experience. That is why Elon Musk is so rare, even though the IQ is not that different.

It is the experience that counts.

Read more in Lexicon section below.

L4 Unique challenges of smart engineers

In entrepreneurship, smart people and engineers face unique challenges. Why?

Engineers are mostly smart, good at school, proud, and hands on. Isn't it enough to succeed in getting funding?

You are kind, hardworking, and loves solving problems. Isn't this what startup business is all about?

Oh boy, when you touch entrepreneurship you are in for the surprise of your life.

Most engineers do not start, because of three reasons.

First reason. They think about a perfect unique idea. They think that is the key to success and beat the odds.

Secondly, they think business is common and only takes one idea to claim your seat.

Third, their pride typically make them unable to find partners and share ideas. They believe they are master of logic and knowledge.

The reality, is that entrepreneurship is a business concept belonging to the business realm. Business realm is where B-grade students and history majors succeed and make a good living. They make the rules. Straight A engineering students have no advantage.

As engineer or engineering students you may be smart and have a lot of knowledge, but you don't have a lot of business weapons. This is the list you don't have:

First, you don't have business experience. You have not even sold lemonade on the street corner.

Secondly, you don't have insider market information. It is like the Allies going to Normandy without a map.

Third reason is this. You don't have capital. Business is arena of rich people and rich corporation. They also want to make money.

The fourth reason is this. You don't have company management experience because you need to be a good boss immediately.

Number five reason is this. You don't have sales experience and don't know how and where to sell. Selling is harder than making things.

Number six reason is this. You don't know how to build a product, although you can make prototypes.

Most young engineers never developed products, never sold things, never worked in large group on large projects, and never built business - hence they think everything is easy.

Even senior engineers in companies with many years of experience never had management experience or business experience - they know a narrow perspective of their practice and don't have the big picture.

You see, starting business is a unique skill. Just because you work in a business does not mean you know. Just because you are smart does not mean you know.

There are three realities for engineers in business:

No one will teach you anything. As entrepreneur, you are going to learn everything.

You will learn everything on the fly, it is like assembling an air plane as it is falling from the sky. It is ultimate challenge to your smart mind.

Smart is not guarantee of any success in business.

Business rules are made up by people who are not A-grade students. The rules are intended to make new comers stumble.

Even the best plan still need to be realized by hustling.

For entrepreneurship to work, you must upgrade your smart to street smart, also known as the entrepreneurship mindset, or business sense.

Business is not a kind space. It requires engineers to upgrade their skills quickly. There is no advantage for smarts, and no advantages for smart engineers. Smart ideas still need hustling. Business may be everywhere and hence “common”, but there is nothing “low” about it.

L5 Get past the noise

Many people can become great entrepreneurs, but the first obstacle is the wall of noise. Our society has put up the wall of noise. The noise is intentional. It reduces your reasoning capacity.

There are a lot of noises and fake information circulating out there. These disable the common sense of smart engineers and paralyze them from taking action.

Here are seven big noises:

1. Smart technology company can get investment and IPO, achieve glory and money quickly;
2. Tech is powerful - be it AI, ChatGPT, quantum computing. It is tech people's imagination perpetuated by media.
3. Success people like Elon Musk and Jobs achieved the status since they are smart.
4. You shall only use your own ideas and try to protect your ideas. It is noble.
5. Once you get a perfect idea, you will get funding.
6. You can make an problem-solving MVP and start to sell.
7. You can be a Shopify or ecommerce star and get money quickly.

Unfortunately these are all incomplete or completely wrong. Let's review them one by one.

Though some tech companies go IPO quickly, it may be only riding on the decades of experience the founder has. Though some companies achieve glory quickly, most can not even make a solid high-selling products after many years.

The second is wrongly emphasizing technology's potential. Technology alone does not sell. The product sells, if it can beat the incumbent and shift the supply chain. People only use new technology if it is disruptive and it is stable.

Third, people like Elon Musk and Jobs are smart, but that is now why they are successful. They are successful since they become business builder very early.

If someone tells you to come up with your own idea and use only your own ideas, that person is not well informed. Many ideas you have are small ideas. The big ideas are all shared. Whoever can realize them owns the idea. Patents and trade secrets are merely speed bumps to competitors.

The fact that you can start to get funding with an idea is absurd. People only give you funding if you have proved your idea work. For that you need to put in the efforts and money all by yourself. It is called fail forward.

The minimal viable product concept is over sold. The suggestion that you can put minimal efforts and starts to sell things sounds reasonable, until you realize that this approach can never scale. The cost must be realistically included.

Last one. What should I say. The only entity advertising the miracle benefit of Shopify is Shopify itself. It lures many people to setup websites, shops, SEO and other components to make money. These people will soon find they can not get steady business at all. It is at best a nice hobby, not business.

The sad part is, most people who broadcast the noise fall into two types:

1. They are doing this on purpose, so they can sell things to people;

2. They don't even know it is fake, and still try to broad cast. These are called media and society. They are the same folks who tell the stories of happily thereafter. They don't care if you fail and lose your shirt by going through to the dead end. By then they will blame you for not reading the fine prints.

Please be aware.

L6 Get past the fantasy

Besides the seven noises engineers face, there are three major fantasies.

1. I am smart, I have better ideas. I will think about the perfect idea and start after I have them. I will protect it because I will need it to get funding. Then I become rich suddenly.

2. Once I have a company I will have money, I will pay back the investors and I will try to ask them for very little money. Surely the rich people will be generous enough when I ask for so little and promise so much.

3. Once I have a company, I will become a boss. There will be many people I can drive to make my idea a reality.

As you see, the fantasy focuses on three elements: idea, money, and immediate help. It sounds very reasonable. It sounds logical. That is the problem.

However, these are all wrong. Why? because these are based on three critical assumptions:

1. There are people willing to pay for an idea, or reward your unusual intellect;

2. There are money to be made immediately once you open a business;

3. There are good people willing to work for you as soon as you start to show your money around.

Many books such as Lean Startup perpetuate such fantasy. It creates a lot of disasters. If something is too good to be true, it is not true. See, the concept of no effort path from MVP to VC to IPO is just too obvious. It is a trap for you to buy their courses.

The mistakes are at least three folded.

1. Instead of start doing something, it makes people just think and dream forever;

2. Instead of preparing for a big game, it makes engineers focus on gadget and hobby, not real big ideas;

3. Instead of learning the inside of a market, it encourages people to take chances.

On surface, there seems to be infinite number of ideas. Infinite possibilities of business. Infinite number of talents for hire. Infinite money supply. However, infinity is not abundance. The path to real success is not unlimited.

Simple reality will defeat the fantasy. I can simply give you four facts.

One, everything takes time. Building a product takes time. Qualify a product for sales takes time. Gaining trust takes time. For comparison, the four years you spend in college really is a flash.

Two, time has costs. Either your time or time of your hired hands. If your time is free, then the cost is called opportunity cost. When your company is waiting to qualify for sales, you can not lay off the engineers who built the products. You must keep paying their salary, and insurance, bonus, and government required pension money.

Three, every idea has competition. Even small and silly ideas have competition. You can not outlaw competition. Competition will come, especially if your idea works. People will go great length to steal what you have.

Fourth, money has competition. Everyone competes for end consumer's money. All startups compete for investor's money and attention. You may be smart, but there are many smart people who think just like you.

I know that it is really hard to face reality. This is the point many wise veterans stop preaching to convert engineers and professors to businessman. If you continue to next section, then you are special.

L7 Don't quit your day job

I have seen many great people quit job and then stuck in a bad company they started. Here is fair warning.

Engineers have several ways to make a living. They can get employed. They can start their own company and business. Moving out of a job to start a company is highly dangerous, no matter how good you are. There are at least two incentives making such career moves.

First, the kind seeking higher challenge. They get comfortable and bored at later stage of life and want to try business.

Second, the kind seeking greener pasture. They are not happy with current work and wants to make changes.

For the second kind, they made three kinds of mistakes:

1. They think employees won't get rich;
2. They think entrepreneurs can get rich;
3. They think entrepreneurship is like switching to a better job because you work for yourself.

These are wrong. Most entrepreneurship loses money in early stage and can only make enough to cover their old salary.

The reality is that most people got it all wrong. You can get rich on a job, and lose a lot of money on your own business. You don't have anyone responsible for you, and you are responsible for everyone.

Instead of jumping on a chance without preparation and safety net, they should prepare and then take on opportunities with known risk.

A premature career move involving entrepreneurship is commendable but very risky. Most people I know who quit their day job and try entrepreneurship eventually end very badly. The classic mistake is this, for only accomplished and inspired engineers.

1. Many people do a good work everyday and then quit job with no preparation, putting the rest of their life in financial ruins.
2. Many people fail to prepare for eventually jump and never prepare for dark side of business.
3. Many people wait for a risk free idea to come along and then jump on naive assumptions.

These are al wrong unfortunately, and makes risk taking fatal.

What are the correct ways to prepare for a career?

First, start entrepreneurship early if possible. Never try to do it late without sales experience.

Second, prepare on your job. Never stay in the engineering niche alone. Learn about industry and market, and use the information for your potential innovation.

Third, learn business including marketing, sales, and financial planning. Most companies and organizations will never involve their engineers for this line of work however. You must seek it.

Most startups take over 10 years to ramp up to normal earning and profit. Never underestimate the time and money loss involves in early stage, or forever.

My story and my goals

My goals for teaching this course are the following:

1. Stop unprepared people from trying;

2. Shine light on the highly inflated notion of startup and getting rich quick. Entrepreneurship is embracing uncertainty and deeper learning. It is not for everyone. It is not for most people.

3. Illustrate the path to prepare and journey clearly.

I am teaching specifically to engineers about business and business building.

Engineers have great education and good ideas. You are not satisfied with the potentials in your job. But can you pay the rent of your factory to produce official products? Can you sell the products you make? Can you get bank loans to pay your suppliers?

In business, engineers don't have too much advantage even if you know how to make things.

1. Business is relationship building. Bad people can have relation with bad people. Even they can get rich.

2. Business is not problem solving. When a problem happens, then many people will try to solve it on the fly. It is competition.

3. Business requires capital and money. In business every opportunity is heavy competition and everyday is a chess match with your competitors. They are not bound by honor, honesty and rules.

4. Business requires operational experience in the market and sector. Formal education does not cover them.

5. Business is filled with uncertainty and change. Any single one can sink a perfect idea and plan.

6. There are not that many business in the world, but there are many varieties or niches. The world of business is large scale relations with benefit exchange. Small ideas don't grow. Solo ideas don't matter, even if it is a good one.

Society greatly simplifies these and try to promote business building to people who are not prepared.

The reality is most people build a business that makes them worse off than a job holder. But these stories are never told. Entrepreneurship does not make average people richer.

I was a classically trained engineer, at the best engineering schools in China and United States. I was doing research for the US department of defense, and has a lot of publications and patents.

However, after 20 years on my job, I am not satisfied that most of my research does not land. I have a hard time converting my advanced futuristic research to jobs.

I tried to go to big cities to search for the answer. I went to the supply chain of the world, Shenzhen, to search for the answer. Then I was lucky to get funding to start a company. That is where I learned business building.

I have read books, written books, and taught classes. But the only time I really learned is when I do it. You learn when you build.

This class is mainly to share things I learned from all these experiences.

L8 If so many companies fail, why people still try?

Many engineers heard that the failure rate of startup is high. But they only know it vaguely. Let's talk about it in detail. Many people, including either students with no employment history or current engineers in companies, do not know what the hidden risks are. Their biggest questions are the following:

1. What are the risks? why so many companies fail? are they not smart enough?
2. Why investors would fund something if they know it can fail?
3. Why there must be risks? can I avoid them if I think better?
4. If there are so many companies fail, why so many people still try?

Here is the answer why people fund startups knowing they could fail. Startup failure is not avoidable. Success rate is low, but many still succeed.

It is like trees in a forest. For an individual seed, the chance it will grow to become a grown tree is low. Many things can happen to it. However, collectively, many trees still grow to become giants.

Since trees are everywhere, we do not appreciate the individual struggle and luck associated with each. Since companies are everywhere, we tend to take them for granted and forget about the great odds each must beat to be standing before us.

Entrepreneur failure is like 2000 holes on a ship. Each single one can sink the mission. Risk of a boat is only revealed to you when you are on a boat. You only know a boat is full of holes when it is half way across the Atlantic.

You cannot look up the failure modes, even if you look for answers in books and on Google. Unfortunately, no one teach you. Risks of a certain boat and a certain journey are only known when you are on a boat.

Investors know the failures. They don't invest in a perfect plan. They only fund teams who have track record of dealing with risks.

Why do investors put money in startups? the answer is this. They want their money to grow. The fund that rich people allocate for startup funding is a very small percentage of their total wealth. This is the part they gamble away freely. Maybe it will be lost. Maybe it will win big. To be honest, they don't care.

It is an unfair game. Rich people have all the money and they bet on a percentage. Entrepreneurs bet their entire life. Investors do not bet on chances. They take risks. They bet big on opportunities. But they don't believe in their chance.

Luck is associated with opportunity taking, not chance taking. Chance is when you think you can make it. Opportunity is when you KNOW the risks. Good industry and business people never take chance with small bet, but they take opportunity with all they have.

Next time you meet an investor, you know this is how they look at you.

If the entrepreneurs face such unfair odds, why so many still try? Luckily, many engineers just think, and they never commit. For the few who try, they learn a great deal. For the even fewer who succeed, they propel society forward.

Like they say, good judgement comes from experience, and experience always comes from bad judgement.

L9: Can someone succeed instantly?

Many people ask questions like this:

How can I succeed on the get-go?

How can I avoid mistakes?

How do I know if my idea is good enough?

How do I know if an idea is bad?

All these questions are sheepish way of asking the same question. The question is. "Is there a way to succeed without too much work"?

The answer is no. There are two reasons why I say that.

1. In business, people buy only what you worked on. They only buy from you when they see that you have put in enough work. People buy your time.

2. We see fast business, but no business grows fast at the beginning.

There are four reasons no one can succeed with no time.

1. Business needs customer, and customers only buy when they trust you. The trust takes time.

2. Building any product takes a lot of work. Building a sales network takes a lot of work.

3. It takes time for you to learn, about the things you did not even know exist. That is the precise point. You only learn on the go,

4. It takes customers to find you, browse, leave, think about it, and perhaps decide to buy. People don't buy what they need. People spend money on value.

On the other hand, everyone can succeed in building business. It is in our DNA and our instincts. Don't let schools and formal education make you so rigid and proud. The only two kinds that don't succeed are:

One, those who never start.

Two, those who does not have patience or time.

In business, you make mistakes when you are trying hard enough. The only mistake is to insist on not making it.

Never make the mistake of not making mistakes. Making mistakes make you better than the person who stayed perfect. He is not growing and learning. You are.

In business, you not only work, but you build a body of work.

Entrepreneurship is a long game.

Smartness won't work.

Ideas won't work.

Doing good and providing solutions don't work.

It is your idea, and it is all your work.

Let me explain in more detail.

Smartness won't work. You need to be street smart.

Ideas won't work. You need time to realize any single one. Good ideas take extra long.

Doing good and providing solutions don't work. Who cares? Finding them takes time.

It is your idea, and it is all your work. So start early. Never wait for a perfect idea, for you may run out of time.

Don't wait for a perfect idea. Start, and perfect ideas will come to you.

L10 Stop thinking

What is the number one stumbling block of smart engineers to become successful business person?

It is their brain.

Most engineers can be entrepreneurs. Most can become Elon Musk. They don't succeed because they never start. They never start because they have too many ideas. They keep on thinking. This is a problem.

Elon Musk is not that different from everyone. But the result is very different.

Elon Musk stopped thinking at age 12, in 1973. Read more about Elon Musk in other sections I provide.

Most people keeping on dreaming about Elon Musk, and never start until they are 62.

There are five critical thoughts why thinking must stop and focusing must start:

1. No idea is perfect. Stop searching. You need to have fighting experience for people to invest in you.

2. Nothing you think others need can be true without testing. Investor only invest in tested ideas. So start testing. The world needs everything, but the world also need nothing.

3. All good ideas come from mistakes, and mistakes come from bad judgement. This is even true for Edison.

There is no such golden book (except I am trying one here). The only way to succeed is to fail.

4. Life is short. You can not wait for a perfect plan. There is a very deep dive after you start.

Life is a competition of specialization.

Life is a competition of capitalized scaling.

Rest assured you are not missing anything by stop thinking. Here are four thoughts.

1. Nearly all ideas can work.

2. The best ideas will fail. The best idea takes the longest time.

3. The good entrepreneurs can execute a bad idea to finish. Get the experience first. Become a good entrepreneur, not a good idea maker.

4. All ideas need adjustments after starting. So start.

Reference books: Hard think of hard things.

L11 Steps from idea to profit

Ideas never become profit instantly. Even the best idea. There are seven steps to turn an idea to profit. Here they are.

Many people treat ideas like a holy object. They want to keep secret by never telling. They form a echo chamber in their own head. They think patents can protect them perfectly. They naturally think the more ideas you got, the richer you become.

But this is wrong.

The journey from an idea to profit is long and treacherous. It is so because of two reasons:

1. The world has already got everything. The world is truly saturated with ideas already realized. If you are great, many people in many generations before you had done what you are planning to do.

2. No one teaches you about the treacherousness, because there is no reward in telling the truth. No one even has the patience to listen (which is the risk I am running here).

There are at least seven steps before any idea can become profit. Only you care, because it is YOUR idea. No one steals your idea before you prove it.

1. You must focus on only one idea and let go of all else. If you work on two ideas, both are wasted. It is like marrying two women at the same time.

2. You must build a product embodying that idea.

3. You must try to see if there are buyers of that product.

4. If there is, you now need to make a business out of it. But you can not do it alone. You must hire people. You can not get money to hire people just by selling things for profit. If the revenue can pay your cost and labor expense, you reaches the break even point. Congratulations. You got a company.

Breakeven is very hard, since your suppliers and your workers want the maximum pay from you.

5. If you succeed at making break even, you must protect this from copy cats. For that you need money, which you may not have - because you are just break even. This is why investors are needed. Investors are not to help you initially, but to help you scale. Investment money is to build protection.

6. For some business, break even is the best they can reach. They can grow no more. This is where it becomes hard. Once you succeed at break even you must try to increase profit. This you do by reducing cost and innovation to get higher pricing power. For that you need great people, which you must hire with high salary. This is why you need to profit - to hire good people.

7. You must keep growing your business from that point on, because new competition will emerge every day. Now you are in the growth and survival mode, but your party can end any day. You must be a leader, or you will be playing catch up everyday.

Each level is very hard to reach. Once you reach level 7, it is really sweet. You have a money tree now that makes you money when you sleep. However, to reach this level is very difficult.

Most people do not go past level 1. Then they discover they don't have money to get past level 2. Every level might be the terminal level of your entrepreneurship effort. If you are rich, you should start again. But most don't have that luxury. However, some people do have that luxury.

To make money, just build a relation. Money will always pass through you when you have a relationship.

To make profit, you need to bend backward to provide extra benefits for free. This part is called value. No one buys something at your cost. People always buy at a price below your cost.

For this reason, profit is hard. You only have profit when you have scale.

L13: How an engineer become entrepreneur?

Engineers are not supposed to become entrepreneurs automatically, just like students are not supposed to become basketball stars. Let's talk about how you can prepare yourself in this part.

Most entrepreneurs envy Elon Musk and Steve Jobs. They think they got there for three things:

1. They want to do good, and have good idea.

2. They are smart. They deserve to create the future.

3. Their success is somehow because they picked the title or pronoun.

Most people do not know the immense struggle they have to go through, their first failures, and why they got where they got.

To be like them, you must cross four basic barriers.

1. Become business minded;

2. Get to know the industry insider;

3. Generate good ideas after you are inside;

4. Be great execution person.

You must start and fail repeatedly until you get the four weapons. Then you take the official start.

The ignition plug is to make and start. You will most likely fail. It is like playing a first person shooter game first time. You can not entirely able to make it through the end. You must first start. You must first fail.

Most engineers' ideal process of turning into an entrepreneur is this. Think. Think. Think. Think harder. They get very confused.

Entrepreneurship is not a job. It is to create jobs.

Entrepreneurship is not a good idea. But successfully sustain a company to produce and sell the products based on the initial vague thought.

There is no auto pilot success. There is only hustle. Hustle by you.

One. Have a good idea does not mean success.

Second, having an investor does not mean success.

Third, having a company does not mean success.

Fourth, even having a publically traded company does not mean success.

Entrepreneurship is not a warm and fuzzy process of "making dream come true" or "inventing the future". It is business. It is a game, and it is war and picking a fight. Entrepreneurship is deep learning.

Entrepreneurship is not a dream that spontaneously and magically happen. It is a destiny you must pay to reach.

Entrepreneurship is four things, just not ideas.

Entrepreneurship is a game. You must prepare for it. Then you must get good or get better, then you start to win prizes. After you win many prizes, you have a brand. Being smart is not an alternative path to ignore these.

Entrepreneurship is business and building business. You must enter business to get ideas, and you must know business before building a good one.

Entrepreneurship is war. No matter what you do, others will watch and copy. And you might even be just one of the copy cats without knowing it.

Entrepreneurship is deepest learning. Even you have a PhD degree, you have not started to learn it yet. A good start is a serious of false starts.

Most people don't know how to start and never start. There are the following mistakes.

Most people wait for the perfect idea to start and hence never start.

Most people fail because they don't prepare. They call the first try a failure, and then give up.

Most people start too late. They only turn on the switch when they reach the end of their job career. By then it is typically too late.

Never try to start easy business. Easy business have no profit, because there are too many competitors. You tire yourself to death.

Entrepreneurship transcend jobs. Entrepreneurship is not a job. Your job is to create steady jobs.

Entrepreneurship is business. And business is not casual. Most people are meant to be job holders, salary makers, or wage earners. Most are not meant to be business builders and business owners.

Here are four caution about job and making money on your own.

Do not give up your job, try to learn from apprenticeship.

Do not use the excuse of bad boss as reason to be entrepreneur. Entrepreneurship is not job replacement.

In your job you get little, but regularly. In your entrepreneurship you get regularly pay yourself nothing but just invest.

Most people never quit their job and never prepare. Professional entrepreneurs prepare, and then quit their job to start.

Entrepreneurship transcend money. It is building a machine that makes money.

Entrepreneurship transcends engineering. It transcends also marketing, business, financing. it is all these in one.

In a business, you must prepare three elements. It is like going to war. You need soldiers, money to pay the soldiers, shields, and ammunition. These elements are:

1. Human resource.

2. Capital or asset.

3. Goods. Either products or goods to sell.

No one will send you reminders. After school, the exams are never announced anymore.

Think of entrepreneurship as building a sand castle. The so called "my idea" is the design. You can build one any where, but you must do it yourself.

Think of entrepreneurship as playing a new computer game you just bought. Why people who play it first time fail? it is designed for you to fail.

Entrepreneurship is transcend yourself.

Read their biography in case section.

They are so rare, they not only took and finished the journey, but they started when they are young.

Read analogies of bike riding about mindset. But you are not that different from the successful one.

There is no auto start.

There is no auto pilot.

There is no auto finish.

There is no security.

There is no guarantee.

There is no chance. There is only opportunity.

Real business building process and life cycle

L14 Entrepreneurship is a business concept

Most engineers think that entrepreneurship is like a label or a hat you wear. Like a position or a title. That is not true. Entrepreneurship is a business concept. It belongs to the business realm. In a related note, the word "innovation" is also a business concept.

You can not simply "open a company" and expect business to flow immediately .

You also can not provide a solution without finding the recipient first.

When you build an MVP and approach a potential buyer, you are a newbie entrepreneur.

When people come to your door on their own begging you with cash, you have a business.

Business world is populated with B grade and C grade students.

To succeed at entrepreneurship you must purposely enter the business world - you may not like the self aggrandizing of former president Trump, or the greediness of capitalist, or any thing you are led to believe. But you can not be an purebred idea maker. Clean as a whistle. No on cares. You must join the uncomfortable world of business and abide by the behavior codes.

No one cares about your new offer. Trust me. The world can always get by without paying you for your idea. If your idea save lives, no one cares. If your idea saves someone money, no one cares until they can trust you.

The schools you went to never teach such code, such details with granularity.

Business is to maximize the offer and value and drop the price, and then exploit your workers and kill your competitions in order to keep that position. That is real business and real entrepreneurship.

If you have moral issues against that, don't become an entrepreneur. The business world including its big money investors will chew out any dreamer. it is the world where B and C students make a living and survive. They made the rules. A-grade students are only meant to be the employees built by B students, nothing more. If you want to break that, you must learn the rules.

Why founders and smart startups fail? because the rules are meant to make you fail and challenge your will.

Business is six things in one. It is a taller order than a dream.

1. It is a relation building;

2. It is a cut throat game. The winner gets to keep all.

3. Business is an experiment. You never know you are right when you start.

4. Business is survival. Even Elon Musk and Apple Computer still need to survive.

5. Business is not to get yourself rich. Business is finding ways to help others rich. When you do that, you get paid. A lot.

6. Business is ultimate professional specialization and leading others.

If you want to change the world, this is the only path. Get dirty and hustle. When you have a profitable big company, you can talk about changing the world.

Remember, talk is cheap. Thinking is cheap. Entrepreneurship is grounding dreams to reality, and realize dreams.

There are two facts when you realize entrepreneurship is business.

1. The only way to measure success of any entrepreneurship is if people pays you.

2. Invention can be one time effort, but entrepreneurship as business can never end. Business can never end. If it ends, it failed.

L15 Stages of business development

Every company on earth carry a business, even the local restaurant and the city government. Everyone started before you were born. You must not ignore them or treat them as a safe fixture or common.

Most intellectuals think business is common. Why? perhaps because business is everywhere. Restaurants, postal office, accountants, etc. It is easy to assume that common things are common.

But there is a story behind every business. Every business has a story. They were built by an entrepreneur just like you, perhaps generations ago.

Every business have at least four stages of development.

1. Some gutsy entrepreneur succeed in finding the business and building a shop or company. They break even and stay on. But many failed. Their stories never told.

2. They find path to continue to grow, through fighting and merging.

3. They figured out how to deal with people leaving and going and maintain the core business.

4. Eventually they lasted so long their legitimacy is never doubted, and they are the only one that does this, and they become a brand.

The development of any business has roughly four elements:

1. The founder's development.

2. Human resource.

3. Capital resource.

4. Asset or products.

When you are in entrepreneurship or business, you are responsible for these four. No one will help you because they recognized you have a great idea. No one will just sign up to be hired as your co founder.

Life is not fair if you are a founder.

1. Founders do not make money. They invest money.

2. Founders do not have work-life balance. Their work is their life.

3. Much of the risks and barriers are man made to stump you.

4. Founders do not get paid, until everyone gets paid. This include employees, suppliers, land lords, janitors, lawyers, accountants, and government.

There are roughly three stages for a founder's development.

Stage 1: Becoming a great student or engineer.

Stage 2: Learn business mindset through practice.

Stage 3: Start to develop a business.

We discussed the risks of founding a business. You must cross at least six check points:

1. You must have products;

2. You must become break even;

3. You must try to become profitable;

4. You must protect your turf and grow;

5. You are then qualified for consideration by investors.

6. You are on your way of learning and brand building. You must build a great company with great managers and employees.

A business is completely developed only when all the elements are prepared and all stages are complete. You can never call a half finished company a company. You must finish what you start, or it does not matter.

Every business take at least ten years to build.

The difference between a business to a hobby or interest, is that business is responsible. To be responsible, a business must last. A business that does not last is not a business.

Every company does this. There are many failure stories even before the first part. Every entrepreneur have tried many things before. What you know about their idea is rarely their first rodeo.

To make the points more clearly, I have some examples. Please refer to the resources pages to see links. For example, please refer to the story of the Chinese online store SHEIN. You are also welcome to check out the story on Libman broom and see how someone made a fortune making the ordinary stuff.

L16 Steps and why it takes time

For startup, it is hard to start, and harder to finish. It is almost impossible to last.

But unless you start, you will never get to experience it.

Many people think forever for an instant start. They can not find an instant start idea. Since it does not exist.

Why does everyone believe in it? because of fake news about them is everywhere.

To officially have a startup, you have to find three things:

1. A product you can make or carry;

2. The target who demand your product;

3. The mechanism to produce a profit.

If you want to have a startup, you have to find these three things. You can not dream about them. No one will help you or show you the way.

Every start takes many tries. The trials and failures are critically important but they are never told.

Start today, on the idea you have TODAY.

Initially you don't know who and what to sell them. After you start, you will find demand and you will invent on target.

A business opportunity is everywhere, but everyone is buried deep.

There are four steps anyone can start.

1. Thinking. And stop thinking.

2. Making and doing.

3. Restart, now that you are inside.

4. Making a hit, and break even.

To realize a dream, you must stop dreaming immediately.

There are three reasons it takes time.

1. It takes time to make and research a formal product. If it does not take time, no one will buy it. It will likely be too crude.

2. It takes time for your customers to convince themself they should buy one;

3. It takes time for you to stay long enough to be legitimate.

After that it snowballs. But before the snow ball it is meager and hard.

The iconic light bulb analogy is very wrong. It implies something happen "instantly" when you are "bright". Unfortunately the media people who perpetuate this lie does not know.

Success is not a switch to turn on the biggest light bulb no one knows. Success sometimes is silent. The only business success is a lasting business and lasting company. It is called a brand. You are an icon. Every business, big or small, is an icon. An icon has won many times. An icon has been there long.

Entrepreneurship is not something new. It is something that can stand the test of time.

L17 Choose carefully

Not all business can grow big, and not all business can have profit. You need to have yourself the best chance to succeed.

Smarts are important, but experience trumps smarts.

Experience matters, but choices trump experience.

Choice comes from experience.

There are many choices. Most people knows only one choice to start.

This one involves the following logic:

1. I read a lot of good books and went to good schools. I must be special. I will think of a thing to make.

2. I will come up with a great idea, a perfect idea no one ever thought of, and convince investors and customers.

3. Then I become rich, successful, and free.

4. My company will go IPO and I hold many shares. If that does not happen, I am still rich since investors gave me money.

Well, this has many flaws.

Most people want to invent and then find buyer.

There are many ways to start beside inventing a useful thing and find buyer.

1. You can start a market and charge commission;

2. You can become a middlemen and charge commission;

3. You can become a factory and let others sell your products;

4. You can own and lease properties such as land.

Amazon is not a store. It is a market. Amazon is very successful.

The Wall Street is a middleman. It helps people buy and sell shares in companies. Wall Street market makers had a great strategy. Wall street makes money even if the market goes down.

China is a factory. Look how rich it becomes. China picked smartly.

TSMC, Taiwan Semiconductor Microelectronics Company, is a factory.

McDonald's Company, the restaurant company, actually owns a lot of lands. It leases land to franchisees. It makes money even when restaurant owners do not make money.

When John D. Rockefeller was starting his business, he caught the boom of natural gas. Natural gas for lighting. Instead of becoming a driller and prospector, he focused on processing raw materials into refined products. He becomes a middleman refiner, instead of a prospector. This may require more capital, but the risk is significantly lower. His business has scale and is not subjected to random luck.

However, never wait and think about the perfect choice. Don't pick and start. Start and then pick.

There are many kinds of companies and business you can start besides "high tech companies". The vast majority of world is filled with "mature tech" companies. Business is nothing but buy and sell, make and sell, buy-make and sell.

This is the art of start. Don't expect to find something no one has done before. Don't expect a perfect big idea to start. It does not matter. You never really start a business. You only start to try and start to learn.

There is no new business. There is only old business done the new way. In that sense, products and technology can change, but business never change.

However, your first choice is likely to be wrong. Even knowing this, you must choose first.

Choose what you can today and start. Start safe. Don't guess. Dont' second guess. Don't take chances and don't expect to be lucky with a one time effort.

Select carefully. Pick one. And stick with it until you have business or learned something.

Your first choice is likely to be bad, but at least you have started. Your brain circuits are being rewired. You are growing mentally.

L18 Super deep dive

Entrepreneurship is not an event. It is a life. Entrepreneurship is life altering, whether you like it or not.

Business is everywhere, but every business has competition. The winner takes all, and therefore has profit. Everyone else just make a living.

Entrepreneurship takes a whole life, especially if you succeed. Any business you build is a life long engagement. It will never be on autopilot.

Let's say you invented the wind shield wiper to help prevent automobile accidents.

When you invent the wind shield wiper, your natural instinct is "I thought about it". Then you try to ask Ford to pay you. This is when you will learn that Ford has made it before, they just are not satisfied. Ford never published papers on it, and never even filed a patent. Filing a patent would alert the competition.

Then Fords buys your patent, but just to prevent you from selling to another car maker. Your patent may become a weapon they can use it to fight against GM, who also have invented the wind shield wiper. But they never put it on cars because the manager thinks an extra item would hurt the bottom line. The manager does not want to lose his job by proposing something outrageously new. He is trying to stay safe on his job.

Suppose you are lucky, you get to work for Ford. Then you realize that the rubber on the wiper squeegee requires a special material that stand harsh winter. And the best material have been patented in Japan, and bought by Toyota.

Then you must invent your own. This is when you go from mechanical engineering to materials engineering. And you need to learn everything overnight.

One day you are made manager, and that is when you must learn about management, especially handling the ego of other smart people.

Before long, this "little idea" quickly become a monster that dominate your entire rest of life. That is the power and curse of entrepreneurship.

This is a hypothetical play. In reality, the inventor of windshield wiper, Mary Anderson, never made a penny from her invention.

You may successfully start something unsuccessful, at the very end.

Schools are rare, and companies are everywhere. However, this does not make industry people common and professors special. At school, you learn the broad knowledge and theory. In business, you practice super specialization down any rabbit hole called market sector. As long as you win in there, there is unlimited money to be made.

Entrepreneurship is easy. It only takes a whole lifetime. It only takes tremendous patience for about 10 years when nothing works.

Execution essentials

L18 Wearing seven hats at once

Most people think a founder is CEO. That is not true. You are everything.

Common misconception about entrepreneurship is three folded:

1. You are boss;

2. You are free;

3. You are rich.

These are all wrong. As starting entrepreneur, you get a chance to learn everything, on your own. You are student in chief. Here is how.

1. You are not boss. You must work hard to pay your employees;

2. You are not free. You work 365, 7, and 24.

3. You are not rich. Your meager revenue first must pay for suppliers, office rent, advertisers, and salary. It will be years before you get paid 1/10 of your former salary at a job.

You are investor number one. And the money you pay can be considered tuition.

But the learning and sense of control is fantastic. You wear seven hats, because you don't have money to pay for professionals yet.

The seven hats are:

1. CTO: chief technology officer, for making the product. The MVP, or minimal viable prototype you got is not enough;

2. CEO, which is chief fund raiser. You must raise money, because organic growth and slow churn will not work.

3. CMO, chief marketing officer. You need to find what customers like and demand to pay for. You must prove that customers do come and like your price.

4. COO, chief operating officer. You must reduce the cost you pay your suppliers, or you work for your suppliers.

5. CSO, chief sales officer. You must build a store and run them. No one will help you or rent you space.

6. Chief engineer. You are to make it impossible for competitors to copy you, even if they can buy and open your products easily.

7. Human resource manager. You must hire and retain talents.

It does not mean you qualify magically. You are doing on job training. You must manage the company you build, you must sell the products you build, and you must hire the people correctly.

Funny you thought before-hand that your idea is so good it is guaranteed success and everyone will help you. Not a chance. Typically, when you start to sell your products, it is first time you learn they already existed. Even Google search does not tell you that.

Building a product

A product is the center of business.

Without a product, an idea is a dream. When your customer can hold the product in their hands, it becomes a proposal of purchase.

It takes a lot to just to elevate a prototype to a product. However it is the transition from hobby to beginning of business.

The center concept of business is a product. Business is buying, selling, and building products. Without a product, it is like a sentence without a pronoun, or a statement without a subject.

A product is different from a prototype or minimal viable product (MVP). There is nothing minimal about a product, even if it looks simplistic. In fact, if you did not spend a lot of work on a product, it is not going to fetch any high price. Why? because it would be common. Common things have no price-setting power.

A product has five things that MVP does not have.

1. It has a specification list;

A product is a promise. It comes with legally binding quality control certification and test results. It is certified to be safe. You must pay for producing the product certification and it is not cheap. Sometimes, each country of sale has own certification system.   A product is standardized and produced in factory.

Even when you use free services like Gmail or Facebook there are agreement you must sign. Don't under estimate the spec sheet. It is a promise guaranteed by lawyer language, and it defines the right of the buyers, to sue you or seek damage. Without these protections no one will buy from you.

Your startup may be able to afford an engineer. However, affording a lawyer is a different matter.

2. It has quality assurance, or you will be sued;

It is repeatable. Its performance is reliable. For example, a product would have expiration temperature and temperature range of storage. These have been tested in laboratories

3. It can be returned anytime, even after 20 years;

4. A product is a fixture in the supply chain. Others depend on your products to make a living.

5. A product is a system, not a standalone object. It must have a sense of quality.

Product making takes time and money.

I share some experience of product making in the extended documentary section.

A product is not a prototype. It is refined. There are three major differences.

1. A product has appearance, color, materials, and look;

2. A product is made in a factory with quality control staff;

3. A product must be complete and must be operable without your handling.

A fancy toy prototype rocket is already pretty impressive, but a product is made with money. For example, a product rocket would list many specifications. Hypothetically, this may include:

•Can return vertically 90-95% of time.

•Can land in this and that weather conditions.

•Can land in different places on earth, including cold places.

•Can tolerate space radiation and temperature swing.

Cost of product development include:

1. Research and development engineers;

2. Tooling for manufacturing and testing;

3. Tooling for reliability testing;

4. Cost to produce certifications;

5. Patents and other documentations.

After this we can start to talk about cost of marketing, sales, and mass production. The sales and marketing cost is a lot more than research.

To make a product, it takes a lot of development and refinement. A product typically costs 1 million dollars to refine.

To ask people if they want to buy it or not, you must present them with a product unit. Otherwise you are wasting everyone's time.

Look for the case studies of product making of consumer products in appendix.

Confirming customers will buy

Most first time entrepreneurs would take their products and seek out random people on the street to buy. This is wrong.

I will first tell you what is the right way.

I will then discuss why there must be an uncertainty.

I will then discuss how to find the fit.

First let's discuss the right way to find a buyer.

The right way is to arrange for the buyer to find you.

Where the buyer search and make decision is called a market.

Everything has buyer. But the buyer and product must meet in the market, or sales won't happen.

Some people ask "Can I have a sure entrepreneurship business". The answer is no. The reason is very logical. Here.

The customer buying is the biggest dilemma of any entrepreneur.

First, if you know something will be bought and where, there is no risk. But it also means you will not get a turn since someone with more money will get on this. They will use money to buy a business, not facing the uncertainty.

You are not even the one with the most information. For example someone who is already in the supply chain grape vine already know this. They have the same information you have. They may not be as good students as you were in school, but they know more than you.

Second, the only business opportunity for someone without capital is to take a risk, hopefully a calculated risk with good insider information.

This is why customer buying is always unknown when you start. You must test and prove it. This is why entrepreneurship is more like science, not engineering.

It is like a marriage proposal, hence it is called a value proposition.

You must be humble enough to treat your gut instincts as only a hypothesis.

Now let's talk about how to find the fit. The general rule is to let the product and the intended customer to meet face to face. An intended customer may convert to a buyer, or not. However, it is important to know that not all intended buyer will buy.

Why would intended customer pay for your product? They are keeping it. There are several prerequisite:

1. The customer believe it is safe to own it;

2. The customer senses discount, or value;

3. The customer find utility by owning the product;

4. The customer find benefits by owning the products.

The customers take time to decide to buy. In reality, they decide to pay the price to keep your products. it is the magic of so called value proposition.

For example, when a customer buys a car, they must know it is safe. Most people don't pay full price. They wait for discount time. The utility they find is the ability to move themselves conveniently. The benefit is that the purchase of the car would increase their earning power and make them richer.

The concept is often talked about. What is product-customer-market fit? it means two things.

One. When you put your product in the right market where intended customers go.

When your product is on the shelf in that market, it is said you have penetrated the market.

Two. When your product is competitive and unique in some way.

If the wrong audience sees your product, they won't buy. If the customer buys your competitor's product, it is not a good fit. You need to compete harder.

The only way to test the fit is to test. Try every combination until you find the fit. It costs money and time.

No matter how good or famous you are, you still need to do this exercise. Like they say, the customer is king. Only they have the mass purchasing power and spending power.

There are many products.

There are many markets.

There are many customer grouping.

Nothing can make everyone happy.

Building your sales network

Finishing a product is just the first step.

You must sell what you build.

You must sell what you build, in a store you build.

You must sell what you build, in a store you build, in a market you penetrated.

After you have beaten incredible odds and have the product, the sales lead, and supplier, you must sell like crazy. Nothing moves on their own, even if it save lifes.

Ideally you want to sell in your own store and on your website. But there are two facts:

1. the store and traffic is not cheap;

2. the store building is entirely your duty - no one will help you.

No one will let you piggy back on their sales system, because it will take their customers focus away.

No magic such as Shopify, Amazon FBA, Etsy will help you sell. They just make it easier to have a digital shop front. A store front with no traffic is worth nothing. The key is to get people inside and do your magic. Good traffic takes years to build, or money.

Hopefully by now you are already familiar with this assessment. When you don't give away shares, you must do all the work. Or the operations will wither away and no one will remember - and the next newcomer will tread over where you were and say "Hey, I got an idea".

There is cost to selling. This may include:

1. Cost of renting store fronts;

2. Cost of search engine and traffic increments; without advertising, the pure organic sale may never catch up.

3. Cost of paying for sales manager and sales people; good ones are expensive and they want rewards.

4. Bonus and other promises so they work hard. Just salary is not enough.

The cost of selling can easily be 90% of your sales. In this case you are not making money. You are just passing money.

The world is a buyers' market. There is over supply of everything, even life saving stuff. Be prepare to sell, or no revenue will develop.

Getting investment is number one job of CEO

If you are a startup CEO, more than half of your work is to get funding. If you are not doing that, then you are not doing your job.

Entrepreneurs and investors have a love-hate relation. If an entrepreneur is a new car, the investor is the gas station. No entrepreneurs can get anywhere without investor. The investors know that, and they are not your friend.

First time entrepreneurs don't know this. They make three classic mistakes.

1. They think investment is minimal and unnecessary. They want to succeed on their own.

2. They think they can easily meet "angels" and VC comrades if they have to, since they own good ideas.

3. They want to wait for investor infusion of money to build products and start their journey. They don't want to use their own money.

These are all wrong. It turns out there are some facts for founder or startup CEO:

1. Investment and financing is full time work. You can never stop.

2. The best time to get investment is when you don't need it. The investors can sense you are desperate and they will squeeze you for shares.

3. Once you get investment, you become hooked on investors and virtually work for them. They become true stake holders.

4. Investors are not fellow chance takers like you. They want to spend big money on big, sure opportunity.

5. They are not some kind of smart people, but they have been through a few rodeos before. They have seen too many smart people failing. They know the rest of the script, but you don't.

You should know that an entrepreneur is never free. You must beg for capital, even if you don't like it.

Investor is not the only one you beg. The second person you need to beg is more.

Most entrepreneurs make the following mistakes.

1. They think they don't want to give up shares and don't want to grow. They just want to cultivate a hobby business and generate live style side income. This rarely works in modern society.

2. They have casual contact with investors too early, when they are not ready. They want to play the "friends" card. Hence they ruin this reputation unknowingly. Investors are friendly, until they ghost you.

3. When they approach investor they keep on talking about their academic pedigree, their ideas, and ask the investors to keep secret for them. This is the exact recipe the investors don't want.

4. They mistaken the investor as a co-founder, advisor, or comrade. The investors are not. The investors only want to make money from dealing with you and your cofounder.

Here are some reasons why not having investment is not an option.

1. Your revenue and profit can never be fast enough to support your growth. If they do, then you are not starting a business. You are starting a hobby. You are trying to make memory.

2. You and your team is the 1. The investors are the zeros behind the 1.

3. Investment money is an escalator that transport your employees to the stock market and get rich. If you don't have investment, you will only have second rate people working with you.

Here are some rules to know why you are not ready.

1. If you don't have a product yet, don't approach an investor. Investors have money but they are not your alternative piggy bank.

2. If you don't have a cofounder, don't approach an investor. Investors expect to see a team, not an idea and its brilliant maker.

3. If you don't have a clear idea, don't chat with an investor. It is not their job to teach or coach you.

4. Don't ask the investors to keep a secret for you. They will call everyone they know to verify your claims. They will call your competitor to verify. All investors communicate and know each other. It is their profession. If you have to keep the idea secret, that means you have not done anything on that idea yet.

If your entrepreneurship is a journey, the investor does not give you a car. They are just a rich hitch hiker. If you are a rocket ship, the investors are booster rockets. They expect you to prepare the rest. But their fuel will take you to a higher orbit faster.

In this analogy of hitchhiker, the investor will be picky about the ride. If necessary, they will demand the steering wheel and drive the car to where they want to go, not you.

Investor is a strange partner in the journey of startup. They are not an advisor or cofounder. They don't work for you. They are not nice, but they are necessary.

The investors do not like small ideas. They are greedy. Small ideas are cute but not business worthy or investment worthy

Remember. Investors make mistakes. Just because you have investor does not guarantee success.

There are certainly smart investors. Elon Musk was investor for Tesla and SpaceX. They made him founder.

Most investors are just employees in an investment company, doing their job and due diligence.

Controlling cost is your own business

To get profit from business is hard. There are only two ways to go:

1. You are the price setter and not price taker or follower;

2. You have controlled costs, mostly through volume order advantage.

If you have no real competition in the category, you can name your price. For example, a price that actually covers your costs. If you can not do that, then you sell at below your per item cost.

if you are the price setter, you are either in a small niche or are really good!

If you can not control price, you must control cost by ordering a lot from your supplier to encourage them. You need to feed them orders steadily. Essentially, you pay wholesale price for your parts, not retail price.

What are the major costs of business? Let me name five.

1. Facility rent and landlords. A business typically have to sign multiyear lease on property instead of year by year.

2. Workers, their benefits, bonus, and severance packages if they are fired. When you fire your bad employees, you have to pay them on their way out. If you think only CEOs have golden

parachutes, think again. If you think being boss is about having workers, then you don't know the workers are hard to fire.

3. Parts and supplier costs to build up inventory. If you don't have inventory, your sales will be halted once the inventory is down to zero, and customers will complain. Inventory keeping is real dollars. No serious supplier will dropship for you. It is drops in the bucket.

4. Marketing and advertising. Ever heard of Google, Facebook, and TV channels? they all get fat and rich from advertising that business pay them. Advertising is necessary, even if your product is good. The best product makers pay top dollars for advertising. Why? it is worth it.

5. Shipping costs. Shipping is seriously costly. That is why companies like Amazon build their own fleet.

Even if you have the product and have customer blessing, no one will make you win. We all depend on each other. You must pay suppliers. If you do not control the cost, the suppliers will charge you just enough that you don't make money.

Here are three dynamic challenges for you to deal with suppliers:

1. Your suppliers likely will also supply your competitors. For them it is open bidding war. If your supplier has no other customers, then it is likely you are making a gadget not products.

2. The supplier price is variable. The more order you give them the cheaper they charge you per unit. Only the downstream buyer with more stable business and more orders will get preferential treatment.

3. To get on time delivery of high quality parts, you must be tyer-one preferred customer.

Most business operate at a price below their cost.

For most business, profit only kicks in at a certain volume of sales.

All big companies like Coca-cola, Apple and Nike are masters of cost control.

Let's look at how Coca cola pinches costs in the appendix.

This is the reason why Apple makes computer chips themselves, build their own stores (iStore), and even make their own entertainment videos. Controlling the source allows you to control the cost.

This is also the reason why Amazon build their own fleet of trucks and planes to handle shipping. For this they charge the customers 100 dollars a year for unlimited shipping. This illustrates the ruthlessness of the game.

Cost control is not optional or elective. It is a competition.

You see, you are not the only entrepreneur out there trying to get rich. There are many other unannounced players in your equation - the supplier, fellow competitors, the entrenched player who don't want to lose their market share, and people who already are rich.

Often you even have players who intentionally loses money to grab business. Because they want to and they can. They just want to bleed you out by having a price war.

Building barrier of entry

Now that you have a business, it is time to protect it. Everyone will try to steal it from you.

A side note, you should think about the barrier even before you start. When you start a business, never start an easy business. Let me tell you why at the end.

Since your business must be conducted in open, everyone at this point already knows your success. They will want to displace you and take the customers and business away. To prevent others from doing that, it is not enough to use loyalty or threat of patent litigation. You must make your business uncopyable. This is uncopyable in plain sight, not by hiding. You must erect barrier.

It is often called barrier of entry, moat, trade secrets. By the way, this is secrets you do not patent. You see, patents to a tech company is just like chain mail armor worn by middle age knights. It is really not enough.

Barrier is not just patents. Legal protection only goes so far.

There are other forms of barrier of entry. For example:

1. Scale of your operations;

2. Capital and war chest;

3. Unique relations you have with customers no one else can have;

4. Location, name, and culture.

5. Certain legal and regulation process can be barrier, such as FDA approval.

When you discuss the term "unfair advantage" with investors, it typically means a special barrier entry that you can cross.

Let's see what some companies have prevented others. Whether they will be forever successful remains to be seen.

Amazon had the early starter advantage. Time was on their side. However, Amazon has used its scale as an advantage that few can beat even if they try.

Google is in advertising placement business. It has a tremendous funnel with free search. Google has permeated into many things, making them hard to replace. It remains to be seen what ChatGPT will do.

TSMC has tremendous barrier of entry. Even Intel can not copy TSMC even though they have access to same equipment. The corporate culture becomes the unfair advantage. The talents build technical knowhow that is not documented anywhere but in internal documents.

Dyson vacuum is a great household name. The barrier of entry is in the manufacturing system that guarantees tight tolerance. The equipment is available to anyone. The engineers is available to anyone. But the engineering knowhow inside is the barrier.

We know Thomas Edison invented the light bulb but lost the war of electricity. The light bulb is great, but the barrier of entry is too low. Just having a piece of patent paper is not enough to stop other entrepreneurs such as Westinghouse and Tesla.

Amazon killed many brick and mortar business. The reason is because the barrier of entry to these business is low. They are capital intensive to own land and organize the supply chain. But anyone with money can do it.

So why you should not start an easy business? Let's name a few reasons.

1. An easy business has no barrier. If others did not set up a barrier, it may not be good business.

2. Just because you don't see the barrier does not mean there is no barrier. Some barriers are hidden. Your perception of easy entry will be met with surprise.

3. Others in the future can take your business.

After a while the brand recognition becomes an barrier of entry for new entrants. However, it does not work forever.

Any company that you see exist has an invisible wall. Ordinary people may not appreciate it. But people in the same industry know.

Barriers take great business and engineering talents to erect.

The barrier you conquer will later become your friend.

The difficulty you mount are the future barrier for anyone chasing you.

Remember this. A business is not just about tech.

Barriers take great business and engineering talents to erect.

Great talents takes good culture to keep.

Building organization and culture

Congratulations! You have made a company. Can it last? Can it grow?

You have built the product, found the customer, got the investor, and build the sales network. At this point the company is your money making machine, and it is growing.

Now you must install a long lasting operating system.

Now you need to take a break, and you don't want the company to fail after you are taking a vacation. It is important to install professionals CEOs, CTOs, HR managers, engineer managers, and marketing vice presidents. How do you make sure the company will continue to run well and not run down by people who does not share your vision and passion?

A company starts with the owner. Even if the owners do not work actively in the company, their influence is still there. Most likely the owner is the founder. The founders and owners hire the CEO. A company must seek professional managers and outsiders as it grows. The owners do not come to work everyday. The CEO does.

The CEO hires the rest, including president, chief operation officer, chief marketing officer, and HR director. Each business unit functions like a small company within a company. Each business unit may also have their president, who hires the rest.

In the functional units of engineering, there are directors, managers, group leads, and then engineers. The structure ensures everyone has a path to promotion and career growth.

You not only need to fill the organization chart, but must ensure the company can self correct problems and stay strong. Managers will leave. Employees will leave. Engineers will come and go. But you want the company to function without a hitch.

This is not a unique problem you will face. Your company must attract the right applicants and hire the right people. More importantly you must make sure the company is well managed to retain the talents. A founder's job is critical to build the culture right.

Not convinced? let me show you some Glassdoor reviews of tech companies. This one says for example.

"Deceitful, uncaring and absolutely no respect for employees. Senior management is a joke. They massage the books. They are not willing to pay for anything and are abusive. Look at their turnover its pathetic and have you ever seen so many low ratings!? HR has no clue what they are doing and belong to serving burgers."

Advice to Management. Quit and go back to school to learn good management techniques."

See, if you let a bad manager in, then everything under him will be shaky. If so, your startup is going to start to go down the drain. This company already will be terminated by the market after many years of failed running. It can never make profit, even though it makes revenue. However, the damage of a bad manager can last a long time.

If a manager lets a bad manager in, then the company profit will weaken, and eventually good people stops applying, and profit will weaken more. The company spirals down with a wrong hire on top.

Here are some bad examples of bad companies after the founding stage.

1. A toxic company, where a micro managing boss runs the show. He will drive the company to the ground. In such a company, bad owners hire bad CEO, and bad CEO hires bad directors, and so on.

2. A clueless company, where a company does not recognize threats and problems. It can not build products successfully. It can not compete against rivals and simply lose.

3. An acquisition target, where it stops growing and become a target of merger. It disappears and becomes a division of a bigger company.

No matter how bad a company is, you only find it out after you join on board. See, no one reads the reviews before you sign on to work. They only write them after. Which almost no one reads.

A company has two critical elements:

1. A management system where good managers hire good managers, and good people stay and grow. A good management system and document is part of the asset and invention of a company.

A big part of the founder's legacy is to setup the management system. A wrong system is like a bad operating system.

2. A culture that rewards honesty, collaboration, and performance. A company is much more than meetings and projects.

It is all easily said than done. Bad companies die every day, but no one reports them. Companies with bad managers stops competing and stops growing.

Business is just relationship

Business is just a relation. Beneficial relations can grow out of nothing. That is why there could be unlimited business opportunities.

Money is originally invented to facilitate trade and relation. If you are rich, it only means you have strong relation and can offer strong benefits.

The points of business is to build inter dependency.

Strong business is about being indispensable. When you have relation, you will be rich, one way or another.

Relations with early stage investors

As business builder, you are going to be professional in relation building.

Let's first talk about relation with investors. You need money to make money, and you need to jump start with capital.

Why do some people want to invest?

Some families are rich because their parents or grand parents were entrepreneurs. They want their money to remain valuable against inflation. They must invest and make their money to work for them.

Early stage investors are one of the three:

1. You.

2. Your parents.

3. Your neighbor and friends.

These are the people who are willing to give you small money without proof of products and sales.

No one else would, not the so called angels, or the rich VCs.

These are also the only folks who will give you small amount of money, for example a couple of thousands of dollars.

The early investor's money is not enough to build a product or sales network. They can only be used to build proof of concepts.

It is important to emphasize that you are the number one investor. In fact, the shares you get from your company is directly proportional to your cash contribution. You can not be rewarded with having an idea.

If you do not invest (such as by giving up your job and steady salary), your parents or neighbors won't invest. Never try to get money from an idea.

Many successful entrepreneurs get seed money from their parents.

Amazon founder got 240000 dollars from parents.

Gates parents are rich themselves so they could have founded earlier ventures.

Sometimes you have an angel investor who is not a family member. Why would that person invest in you? They are not here to loan you money or act as your bank account. What does the investor want?

The investor want to sell his share in your company to another investor.

He is not interested in the following:

1. He is not trying to get part of your revenue and income. This is because of two reasons. One your income will at least make him come out even. That is not enough, considering the risk. Secondly the investment is not enough to get to the revenue.

2. He is not interested in being paid back. He wants his money to grow.

3. He is also not interested in donating small amount of money to you even if he is rich and comfortable in life.

4. He is not interested to be your partner. He does not want extra work.

If you want to have one investor and build a hobby or business, that investor won't bite the hook no matter how hard you try. Never pitch a one of a kind, unique, never thought of ideas to an investor. It is too out of the main stream.

Relationship with late stage investors

Entrepreneurs must beg for money. Both before and after you make money.

The more successful you are, the more money you need to borrow.

Investors only invest when they see the chain of investors after them. They don't take stupid risks and don't put themselves in danger. They want the safety of numbers.

The chain of investors and their typical investment size is below.

Research foundations: 200,000 dollars a year

Family and friends round: half million

Seed round: 1 million

VC and later rounds: 5-20 millions

Bank loans:100 million dollars a year

Investors work in stages. Much like coaches work in stages. There are mom and pop coaching little league, then there are park district coaches, then there are high school coaches, and there are professional coaches.

However, investors do not coach you. They expect you have coached yourself through experience.

Few investors are perfect.

Many investors have worked in companies. But very few know how to build a business and company from ground up.

Investors do not invest in smart people. They have seen ten smart people yesterday alone.

If you are good, you want other third parties to say you are good. In entrepreneurship, you fail because it is real competition.

Investors want to investors who have tasted failures.

Business building is a game of war. It is war. It needs supplies. It is a game. It needs learning, talent, and hustle. Being smart and imaginative does not provide much use.

Late stage investors are banks and other financial institutions. They have a lot of money waiting to invest and they take on less risk simply because they are putting down tens to hundreds of millions. They may not care so much about shares in your company or your IPO, but they just want their funds to be safely returned with interest.

Investors are not generous comrades.

One way they increase safety is to ask for your collateral. If you ask for half a million and your house is worth half a million, then you can offer your house as collateral. (The VCs called this hedge and some VCs want terms if you fail to meet demand).

When dealing with VC, it is important to know three things:

1. VCs are not entrepreneurs. They are employees of financial management companies;

2. VCs want to be paid in large multiples quickly. They typically do not wait for your profit or IPO to cash out. They want other VCs to pay them in the next stage. The money they manage have term limit as well. It is not their money.

3. VCs is a community. Once you get funding from one VC, your fate is locked and you continue to work for one VC after another.

Venture capitalists are not nice friends. They are business vultures for naive players.

1. You must pay the VC according to terms. For that you can not use your cash reserve or revenue. It is not enough. The VCs do not need you to pay back, but they do care.

2. The VCs give you just enough for each period, and use your performance to decide if they gives you more. If they don't, your operations will run out of cash instantly. If they do, then the next round of evaluations on tight leash continue, until the next round.

After the VCs get their money, after your company IPO on the stock market, the real big investors start to come in. They are the banks. They will provide you loans in return for interests. But even public companies can not escape the banks.

Even big companies can close when running out of cash.

This articles says it all.

"Borders' collapse is both expected and disconcerting. The company filed for bankruptcy protection last February and has struggled ever since. After closing a first wave of retail stores, the bookstore chain had increasing trouble even stocking its shelves, as publisher after publisher refused to send inventory to Borders. This was because Borders delayed payment to publishers on books it had already sold, and the company wanted to establish delayed-payment plans for itsfuture sales."

The banks need collateral. The borders don't have that. If you do not pay them back in time, they will confiscate things of value.

Why big companies still borrow from the bank? because it is the advantage and barrier to scare off small new players.

Entrepreneurs must beg for money. Both before and after you make money.

The logic is simple. No one can grow with revenue. No one can grow fast enough with organic profit. If you do not grow, you start to decline.

Even big companies risk everything by borrowing.

If you do not borrow money, you will remain a hobby and it is only your own business to fund it.

L31 Relationship with customers and demand chain

All business runs on the life blood of cash. The cash of all business come from consumers - directly or indirectly.

Money does not grow on trees. They come from the pocket of consumers.

Customers are called the kings. They are the most important for three reasons.

1. Customers is the life blood of a company, long after the investors have moved out. Without the customer continuously providing cash to a company, no company can sustain by investment.

2. Customers may be ultra demanding, but ultimately they pay cash once they see value.

3. Customer and consumers are vastly powerful. Even if one American citizen pays you 1 dollar, you would have got 300 million dollars. The power of consumers comes from its numbers.

No matter how large a company is, they must draw cash from consumers. Coca-cola makes money one can of soda at a time. McDonald's still sell one hamburger at a time. Google begs you to store files in their cloud service.

We see people buy things all the time, but selling anything new is hard. It takes long time to build the demand habit.

Customers are hard to win, and hard to keep. They may appear to be faceless, but each has their demands.

You may not like them, but they are the only source of cash.

Customers want bargain, safety, ease of mind, and ease of return.

Customers may complain about you, only when they care a bit about what you offer.

Customers only pays you the price after careful deliberation of three factors:

1. Utility;

2. Benefits;

3. Bargain.

This is even true if someone appears to make a purchasing decision on a whim.

A business must constantly fight to win customer's favor. They must win new customers everyday, or other companies will win them over.

The purchasing power of consumers form the demand chain. There may be many possible ideas for business, but there are very few hard demand. Educating consumers and customers is crucial. It is otherwise useless to guess new things they may buy. You must educate them to buy. This is costly.

Customer education and acquisition are expensive.

After the demand chain forms, many business then form the supply chain to supply to the demand.

Consumers demand to spend money. If you sell something that are not covered by demand, you will have a very hard time selling. You can make sales but it will never be mainstream.

Relationship with a cofounder

In startup, you win or lose as a team.

The cliche is this: if you want to go far, find a partner. If you want to go fast, go alone.

The cliche is true. In startup you want it go far.

There are many reasons not to have a co-founder.

1. I can not find one. It is inconvenient.

2. Maybe it is OK just by myself.

3. I don't want to tell anyone my idea.

4. Maybe one will come join later.

5. I will hire a co founder when I get things going.

The co-founder is a critical elements. Here is a crucial benefit of having a co-founder. If an investor sees that you are a solo entrepreneur, he will not fund you.

If Michael Jordan goes to NBA game with no team mates, would people still buy tickets? I think you know the answer.

What makes a cofounder different from a contractor, a help, or a tech assistant? There are two important elements.

1. A co founder has quit his regular job.

2. A co founder has put cash investment into the company coffer, not just sweat and work.

In some countries, the shares percentage is only related to how much cash each founder bring to the table, irrespective of his talent. In other words, everything is converted to cash terms.

On the other hand, an hourly, a volunteer, a contractor, or advisor never give up his job and steady income. To some extent, they should never be given shares.

Don't give valuable shares to people who did not give you cash. If you need help, pay someone.

You have only 100 percentage points of shares. You can not throw them around as a token of appreciation.

A cofounder is like a spouse. He/she must have some qualifications:

1. A mutual understanding and ability to work, elevating each other to higher level. In other words, similar value and IQ levels. If a cofounder is smarter than you, it is even better.

2. A cofounders should have non overlapping roles with you. Together a founding team must have technical and marketing skills.

3. A cofounder should be a who's who, not a novice. The cofounder's clout should become the company's unfair advantage. Any investors would demand that.

Without a cofounder the startup is doomed from the get go, even though it will only be evident to you after two years.

Here are two reasons.

One. If you can not find or recruit such a person, take it as a sign that the idea is not good. Never fall in love with yourself nor your ideas.

Two. You are going into a battle without knowing where the enemies are ambushing you. Technical stuff is common. The knowledge you cherish is common. The ability to make powerful disruptive products and sell them in market is a challenge above finding technical talents.

Remember, business is the arena rigged by B students - so that A students with no experience will fail.

If you don't have a cofounder, your idea is not good enough. It is too small.

Small idea won't get investment. You are going fast but going no where.

Relationship with supply chain and ecosystem

No one can make money alone. No one needs anything. No relations, no money.

Money is simply a measure of how connected you are.

Business is largely buying and selling.

Some people do original product making or parts assembly, but they are the minority.

Most business is just providing services to move the products others made.

Market maker and funnel makers are also business.

In business, selling something takes more money than making them.

Business don't care a product. It cares about moving them through the supply chain and earning commission. They get a cut of the total money that theend consumers pay the retailer.

If no one are incentivized to sell your product, then your products won't sell. They will just sell someone else's products.

If you make products, then the things that sell like hot cakes are the things people help you sell. If you decide to make money on your own by your own and for your own, you sell nothing.

If you have a product, you must recruit powerful parts suppliers to you and powerful distributors. If no one distribute, you won't sell. If the best supplier don't work for you, they will work for someone else.

At the end of the supply chain is billions of consumer. Consumers demand to spend money, and everyone wants to figure out what the consumers want to pay for.

All members of the supply chain gets rich.

Apple products are sold in mobile network providers such as AT&T and even Costco. Apple also has made Foxconn a vital partner of manufacturing, instead of making things themselves. Apple helps Foxconn get rich. Helps app store game makers get rich. Help AT&T get rich. That is how you behave at the big guy. That is how every one look up to you. It is never just about a good product.

The red arrow indicate direction of service or product. The yellow arrow indicate the direction of money movement.

Apple is a master example of building an ecosystem. Everyone in the ecosystem gets rich. If you remove anyone element, then others will stop making money and the consumer will simply reduce spending.

There are stories to make you believe. For example.

1. All Hollywood movies have distributors.

2. All sport stars have agents.

3. All book writers have agents.

If you don't have a promoter, nothing really moves.

After you have a product, you can not afford to be alone in the supply chain. You are responsible for helping your sales channel make money. Or it won't sell.

You can not move the products on your own to the consumers. You don't have the funds for that.

If your product does not help your upstream and downstream then no one will care. This is assuming you have a good product. For example, if your product is a commodity and thin margin, then it is lean business moving them.

You see, the world is saturated. Nothing is indispensable. You must be indispensable to your ecosystem, and that is how you shine.

No one is strong enough to succeed without help. Your helpers makes you, even if your product is inferior.

The more people you help, the more help you get in return.

Read my stories to learn why inferior products makes more profit and more sales.

Relation with competitor and imitators

Ever wonder why silicon valley companies are located at one expensive place? The cost is extremely high there. Ever wonder why restaurants always get to be at a restaurant row? why many startups begin on the same idea and have head to head battle?

The reason is because business don't avoid competition. Beginners have some wrong ideas about competition.

1. They think you can shut competition off with patents;

2. They hate any competition are bad and non ethical;

3. They want to pick an idea where there is no competition.

These are all wrong.

People all know Thomas Edison invented the light bulb. However, many don't know that he was sued over 500 times in a year for patent infringement. If he is sued this many times, can you imagine how many times he has to sue other competitors?

Don't hate your competitors. Your competitor and copycat is your friend. There are several reasons.

1. With no competitor, your organization will soon lose the edge to innovate.

2. Without competitor, the stock market has no reference to price your stock.

3. If you are supplier of some industry, all big down stream companies will always keep two suppliers for insurance. Keep your competition as a backup tire.

4. If you dominate the entire game, you will soon get a visitor from the monopoly enforcer.

5. If you are the only game in town, you will jack up the price and get comfortable. Competition will inevitably come in, by your invitation. Your employees will become arrogant and your customers would have second thoughts before you know it.

That is why Apple and Microsoft coexist, why Intel allow AMD for survive, and why Amazon does not kill all its competitors by just buying them.

Never pick something where there is no competition. Likely it is a bad choice because

1. If there is truly no competition, you will not have business;

2. If you think there is no competition, it most likely means you no nothing about the market;

3. If something is easy, it will be easy for your future competition if you succeed.

4. If you happen to have a business, many big companies with a lot of money will pivot into your business anyways.

Your job is not to stop your competitor. Your job is to be number one. Your job is to build the barrier of entry, and slow the competition down.

Without number two, you can never be number one. Competitor is a fact of life. Get used to it.

Relations with yourself

Entrepreneurship is to enter business building. You will live three lives in one, instead of one life in one.

The three lives are:

1. The regular life of everyone else;

2. A business building life;

3. A business managing life.

Entrepreneurship is a life transforming decision. It changes one's life.

A normal engineer begins as engineer and ends as a middle class engineer. He is never the CEO of his company. With entrepreneurship you will be the CEO.

A regular CEO does not know how to build business. They only know how to manage one. However, an entrepreneur knows how to build a business out of nothing.

Not all engineers need to be entrepreneurs. Not all will succeed.

Why most engineers remain engineers? why some become Elon Musk?

Most think about good ideas to change the world.

They keep thinking, but never start. They don't start because of fear. They want perfect idea to show they are smart. They want to be smart, and they think smart people stays perfect.

No matter how many companies they worked for, they have no idea how business is actually conducted.

Most never even become manager.

One day they are bored and start a business. That is when they realize they have no capital, no business sense, no product making skills, and no human skills to manage employees.

Then they fail, and becomes part of the statistics.

Elon Musk started business education young, and then he started school. He is fully grown business minded engineer.

A person who has worn the hat of startup founder will lead a very different life, for good or for worse.

There are three main characters for a founder's life.

Business is professional life. Engineering, interest and passion are all raised to the highest level. You compete, rather than doing your best. You push yourself to survive the competitor assault and to win the crown.

Forget the original goal of doing good, getting rich, or becoming free. Entrepreneurship will change your attitude. You will be humbled but you also will learn to market your product and yourself. You will not only just be smart, you will be wiser.

You actively change your life, to an extent you never knew life can be changed. If you start earlier in your life, you have a chance to get rich. If you start later, you may not have time to recover from setbacks. Your income may forever be lower than what you can make at a job.

You must fail and you must learn by failure. Why?

1. Failure is not due to mistakes. It is due to unfamiliarity.

2. Failure is because you are beaten, not a mistake.

3. Failure is learning what does not work.

You must leave time for failure making.

We will continue to talk about the pros and cons of employee vs. founder at another episode.

Summary: Build relation with trust and benefits

Many engineers are not supposed to be successful in entrepreneurship. In fact, they should not even start.

If you don't agree with this, then I hope you agree with the following.

Don't make money. Make relationship.

Business is many conflicting things for engineers.

Your engineering and book smarts are not enough anymore. You are playing a game in order to realize your dream.

Your odds of success is just same as everyone else. Whether you have an Ivy League degree and you are in high tech or you are a tech genius do not matter.

The elements that would increase your odds are:

1. You need to find the demand first, by all means. Demand can not be guessed. What you guess is wrong.

2. You need to gain the business sense, by some means. Most employees, even CEOs, don't have business building sense.

3. You need to be an insider first, by all means. The insiders are waiting to ambush any new comers.

4. You must become interrelated with the customers, the supply chain, and even competitors in the same market.

5. An alternative of 3 and 4 is to have good connections.

If you are lucky enough to start right, then you need to be extra lucky on several fronts.

You need to borrow money and grow a business to be a clear number one.

Your company can survive a couple of rounds of competition and challenges.

And you need several tries until you become good.

Going to schools and reading books do not help.

Most engineers trying their hands don't get lucky. There are several scripts of rather few successful stories.

1. Many started to build and sell on their own in college. They build computers or software. Some even quit college. Examples include Microsoft's Gates, Facebook.

2. Some established technical people develop products and start to sell. Mostly it is software products, because the cost is low and valuation is high. Mostly they have to quit their job. They typically sell their company.

3. Some bootstrapped a company on their own and support themselves with government contracts. They remain on very thin profit for many years.

Four advice for all engineers from all schools:

1. Start early. Or don't start at all.

2. Start build and start selling. Do anything you can today. Don't try to improve your ideas.

3. Drill deep. You can get lucky everyday, but you need to realize that.

4. Do one thing. Never two. Never be greedy. Be real.

If you are engineer, getting good grades at school is the easiest. Most ended up making less than their salary potential or suffered life changing events such as divorce or bankruptcy. Or they got stuck with a business that can not grow. It affects only great people.

Getting into entrepreneurship is like trying to get 5 PhD degrees.

Business plan and planning to build a business

All business has the same logic

Business is a weird concept for many. Business starting is a special form of business.

However, all business has the same logic, whether it is a convenience store, Intel, NBA, or a school.

There are three important concepts.

1. Entrepreneurship must be realized through business. If you don't do business, a dream is forever a hobby.

2. Business is created out of nothing.

3. There are finite business but infinite combinations.

People need everything and people need nothing.

Some people can care about something, but no one cares the same thing.

Business is relation and benefits created out of the blue.

There may be infinite ideas, but there are not infinite business to choose from.

There may be infinite buyers, but there are not infinite demands and supply chains.

A mature entrepreneur does not think about an impossibly good idea. He thinks about executing a plan others think impossible.

An mature entrepreneur don't think about the startup. He thinks about the end, when the product is copied ferociously, the company is mature and business is ran by professional managers.

A true business builder build a business and a company, which produces high quality products and maintain the edge over competitions. For the end game, the choice and design made at the get go matters. There is no second chance to choose.

Business is looking at many things in one.

Business is profit centric. If there is no profit, then business is just a hobby. It does not matter.

Business is product centric. Product, funnel, and channel are together.

Business is relation centric. People make money together. One aspect is the supply chain, marketing channel, distribution channel. You must contribute to others moving their products.

Business is inter-relation centric. You are someone else's business. This is the only way you can have business. Every business person helps some other business persons. You are a money mover, through selling.

Business is selling centric, not making centric. Selling is a lot more work than making. You see people sell products, but the network of selling is the key. Regular people can sell nothing, even good and useful stuff.

Doing business will change your ideas of money.

Never do business for money.

Just the same as never play basketball for money.

Never compete in the Olympics for money. Successful entrepreneurs and regular employees look at money differently. The entrepreneur thinks money is a certificate of being useful to someone. Average people think of money as a means of buying what they want.

Some people collect money. Some spend money. Some earn money. Business is a machine that makes money when they sleep. Entrepreneurship is to build that machine.

We have a lot more to talk about in the coming sessions. Stay tuned. Thanks. If you like this video, watch more and share.

The logic of start

The logic of operation: Market, funnel, conversion, profit, price

The logic of growth

The logic of competition

The logic for employees

The logic for owner

A store is not a business. A website is not a business.

Ecommerce: shopify, or hobby is not business.

Business is weird, because most people are just consumers.

Entrepreneurship is even more weird, because starting business is a special form of business.

L39 Business method and business model

Business uses finite resources to reduce cost, increase profit, increase cash reserve, increase customer loyalty, and prolong corporate life. Exactly how they do it belongs to the realm of business method, business model, and trade secret.

The business method and business model are different concepts. Let me explain with a few examples.

The business method is typically insider tricks to make money, whereas business model is the open book path for translating foot traffic into money.

For example, COSTCO and Walmart are both super markets. On paper they are competitors,but they really just complement each other. Costco charges membership fees which account for 77% annual revenue. It targets slightly different customer base. Walmart uses volume to reduce cost, and therefore offer lower price to maintain the volume. For Costco and Walmart, the trade secret is its supply chain.

Google, for example, operates a search engine. However, this is not something anyone willing to pay. For Google to make money is actually not easy. The model they invented is charging for search result position bidding. This is the business model that non previous search engine companies used. This is literally their invention.

Google's business method is how to maximize their income from this model. Google opens up every English letter and their combinations for bidding (hence the mother company of Google is called Alphabet). They introduced the SEO business and maximize bidding. This allows Google to become an ecosystem company.

Amazon is an online store. However, the way Amazon makes so much money is to become a platform company, allowing many people to operate stores. Amazon charges platform fee and host daily position bidding, called sponsored ads. In other words, Amazon becomes a search engine of all the products that it operates.

Amazon later offers handling of shipping, inventory, and item return. This allows anyone to operate an Amazon store. Amazon charges large percentage of their sales. This is the business method.

Every company has the Ying-Yang side. The business model is how to turn popularity into money, and the business method is how to maximize it.

The business model is not copy-able. If a competitor copies your business model, they will just become you. It is pointless.

If the way to copy is to spend a ton of money, then it becomes uncopyable.

The business method is never told.

If you have a business, you need both a model and method. The model is the key. The method is where you hide the key.

L32 How to sell a product in market and stores

No one makes money alone. If you make it alone, you don't make money.

In this episode we talk about three things.

1. You must penetrate a market and setup shop;

2. You must attract market goers to your shop's front door;

3. You must sell products inside your store.

Money is made in a market, where competitions exist, and where customers open up their purse.

Most engineers who wish to become entrepreneurs have never even setup a lemonade stand in the neighborhood. They got it all wrong.

What is the wrong process:

1. I will make a prototype, crude but functional;

2. I will approach people and impress them

3. I will set a price, arbitrarily low to entice them to open their wallet. I will also add on some profit for myself.

This is wrong. The right way to sell is this:

1. Setup a store in a market. Next to your competitors.

2. Wait for customer to come to the market, approach you, browse, pick up and examine, and consider your price. See, people want to shop. They don't want to buy. People want to spend. They also don't have to buy anything.

3. A certain percentage may come back and buy.

For example, Amazon is a market. There are many stores, and visitors to Amazon.com browse, think and log out.

Why don't people use the first method? because this is the lowest cost. The customer acquisition cost is low this way. Don't call amazon a store. It is a market of hundreds of thousands of stores.

Many so called businesses are actually markets. The wall street is simply a market. NBA is a market where talents show off their skills. The downtown area in each city is a market. In many places, the busy street becomes a market. The terminal area inside airport becomes a market. Different people get attracted to different markets.

Markets attract people to go.

Google sets up a market for advertisers. Hollywood is a market where people go to look for new movies.

Market makers have strong positions. Wholefoods is a market. Amazon is a market. The infamous founder of FTX bitcoin market maybe shady, but he got the right idea - make a market.

The difference of market and store? a market is made of stores. A store sells products from one company. The market sells products of many companies. People visit a market. They don’t visit a stand alone store.

If you want to make money, you must compete.

There are even world competitions for bicycle riding and dart throwing. Same for business.

No competition, no money.

People only buy from you after they have checked out your competition. People only buy when they know there are no better deals.

L21 take risk but not chance

One great mindset of successful entrepreneurs and investors is that they don't take chances. They take risks. What is the difference?

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Let's compare taking risk and taking chance.

A risk taker knows the odds against him, but he still does it because he has skills to adjust. Or they can survive the worst.

1. A chance taker assumes the odds are good and no bad things could happen.
2. A risk taker is willing to take the worst case result and consequence.
3. A chance taker assumes only the luck is on his side.
4. A risk taker is doing it for a second time.
5. A chance taker is taking a first time ride.
6. A chance is when you don't know your risk. Therefore, great entrepreneurs are never first time entrepreneurs.
7. A chance is where you believe things may turn in your favor, by mystery or "I believe".
8. A risk is where you know things may sour. You know because it has happened before to you.

Great entrepreneurs start early in life. Their first risk does not cause permanent harm. Bad entrepreneurs wait and start late, and lose the livelihood on a chance and gut feeling.

Great entrepreneurs are not doing this as their first rodeo. No one wins a trophy on their first rodeo, let alone a luxury yacht.

The only way to deal with risk is to know it.

The only way to evaluate risk is to be inside.

Risk is necessary because ... only people with a lot of money can buy their way out of risk and take only the sure bet. For anyone with lesser zeros on their bank account, risk is your friend. But chance is your enemy.

For most people, if you don’t take risk, you have no chance.

Take risk, but not chance.

Take risks, but don't lose your livelihood.

There is a fine line and the moral compass and text books are not enough.

You have have vision - namely you must have done this before.

Always assume the worst will materialize. This is the difference between Planning and Hoping.

Example: Founder movie.

L22 Why startups must fail

Since our air wave and internet is filled with news of great successful entrepreneurs, most stories of failed startups are never told.

How can a founder fail? In a nutshell, it is not so hard to create a small success. But if you don't make it big, you failed. Business must be big.

Let's list five big reasons. The fact "idea is not good enough" is never the reason.

One. Failure to take off. You can not reach break even stage in short amount of time and limited capital. You run out of money. Within the time frame, you fail to find partner or edge. You must abort.

Two. Failing to scale. If you fail to grow to break even or profitable stage, you don't have a prayer. You must abort. For example, you may fail to get investment because your concept is not trendy or big enough.

Three. Can not compete. You simply can not put together a product or selling system.

Four, you get beat by competitor or sabotaged. Competitors come in different colors and sizes. Some big and well capitalized. Some small and dirty. Many bigger than you and dirty.

Five. You are just a bit too late, or just a bit too early. You found out later that the idea has been done before. The information about your competition can not be googled. Google does not know. If it knows, it does not tell you or warn you. You must find it out yourself.

Every entrepreneur must fail once. Most are just good at hiding that failure and never tell.

Why so many founders fail? because they never restart.

Why first time founders must fail? there are four philosophical reasons.

One. They have no track record of failure. Hence no one trust them.

Two, they can not take off within short amount of time and learn on the fly. They might be good students, but this is extreme test.

Three, they run out of money.

Four, the timing is wrong. Too early. Or too late.

In startup, Money and timing are critical. money can solve every failure. and timing is more important than idea.

Money paid for failure is real tuition of startup school.

L40 Why plan and why plans don’t work

Why do VC investors always want to see a business plan? What should it include? why I always fail to make my case? Why the VCs always ask me to "come back again"?

A business plan have the following six elements:

1. The opportunity and timing.

2. The team and why it is unbeatable.

3. The business ceiling and total addressable market. It is basically how big a business you try to capture.

4. The risks. All the risks. Don't be shy about it and say there is no risk.

5. Your plan to launch into that market and business.

6. Your plan to beat incumbent players and future competitors. Don't say they don't exist.

Investors only invest in person or team, not the ideas.

Investors invest people who have been there done that before. Not the super smart chair professor from MIT whose students have successfully formed companies.

Business is war. A plan is necessary.

Business is also like playing chess. You must beat against another person. No plans work. You must adjust.

People present their business plan to investor with fear. It does not have to be. Investors know two things.

1. No plans work. It is the adjustment that matters. Plans never work, because real operations involve live situations you can never predict.

2. A daring plan that seems impossible beats the safe plan. Being bold is necessary. But they don't want stunts.

Plans don't work for three reasons.

1. You are playing against another person.

2. The inside is rigged with barriers that hide from you.

3. Many things have to work to make the plan work.

Ever had a vacation where things go wrong? plane delays? hotel overbooking? real world is complex, and there are always many pieces of moving parts to your plan.

If the investors know that plans don't work, why do they still want to hear a business plan? In fact, they just want to know how experienced the skipper is. Consider this a personal interview rather than a presentation.

The "business plan presentation" is to show the homework you have done, not to show your smart guess.

If you assuage the investor that there are no problems, they won't see you again.

The worst situation a first time entrepreneur can present to investor is to tell the investor the following:

1. Bad situation One: no worries, I am sure my idea is so good everything is smooth.

2. Bad situation Two: I have no plan, but I googled last night and found some exciting marketing information.

3. Bad situation Three: I have a plan, and it is safe and easy. I will do it alone, because I am a big shot.

The veteran investors will immediately walk away from you. They won't coach or advice you on anything.

If you present a bad plan and get money, be careful what you wished for. You may just got into a trap of cheap money. You may have signed up for mission impossible without anyone knowing it.

L41 Target audience precisely and offer unlimited benefits

The first big test for engineer entrepreneurs is practice disciplined focus. You must reduce unlimited imagination to focused pursuit. You must connect to target buyers and spenders. This is the test and you can take it only one time.

Your business must have a clear target audience. At the wedding, there can only be one bride. For every business, there can only be one customer. This can not be vague. If you are vague, nothing will happen.

In this section we discuss three iron rules for starting.

1. Target small at beginning.

2. Increase traffic and increase browsing count. Browsing is the first step of buying.

3. Offer benefits and value to convert browsing into buyer.

Why must you focus at start? wouldn't it be better to broaden your customer base?

1. Each company can only represent one thing. This is important in a market. You can not sell three unrelated things to increase your chance.

2. Getting customers is costly. Each buyer converted is costly, especially at the start phase.

3. At start, you are on shoe string budget. Even the VC money is only shoe string money. VC money is not enough business war chest. VC is not your bank. You must spend the money wisely.

We see the dedication all the time. California Pizza Kitchen only sells pizza. In fact it is only for one type of pizza. Starbucks don't sell fast food, even if its customers perhaps won't mind. Amazon sells everything now, but they started being a book seller only.

You can grow your customer base later, but you can not cover everyone on day one.

People who do not want to focus do so based on three wrong concepts:

1. They assume everyone on earth would see your website;

2. They assume right customers would buy immediately;

3. They assume people will not mind covering your cost plus a healthy profit margin.

These are all wrong. Customers do not find you. You must help them find you. They take time to decide, and many forget to return to your store. They even forget the name of your new small company.

Targeting is risky, but necessary. It is your first test.

If your business is designed to keep two target audience happy, then no one will be happy. When you target audience you may make mistakes. However you must take the risk. The practice here is to make big mistakes safely.

In school you can practice for a test many times. Practice makes perfect. In business, the practice is the test. What is the test about? it is about whether you can make a magnet to attract the target customer, whether you can offer products greatly appreciated by the customer, whether you can make the price very low, and whether you can prevent others from hooking up with your customer.

You have one shot, and you must find a special friend who you must bend over to provide immense benefit. This is what entrepreneurship is about. If there is no uncertainty, then there is no point in doing it. Because someone else would have already done it.

If there is no uncertainty, there is no business.

After the focus, the next test is to entice the buyers to pay you.

Veterans know that many potential buyers only browse and don't open their purse. They know it is OK. They want browsers, even if they are not committed.

In relationship it is called dating. It is engagement to fiance. You let people examine. You let people try.

Veterans know the traffic is important. They know only 1 person out of 10,000 browsers buy.

The last hurdle is to gradually make the browsers pay and keep your products. We discussed this earlier. A customer must see four things:

1. Utility;

2. Benefits;

3. Bargain.

4. Zero risk.

Customers are picky.

The right way to do business is to focus audience, attract as many candidates to your store, and project certain percentage of them will buy.

The wrong way is to be vague about your customer, and try random people on the street to sell. This never works. It is just like approaching a random girl on the street and asking if she wants to marry you. It is crazy.

L42 Designing exit before start

No startup will be in startup phase forever. When it becomes a mature company, the founders and investors can exit. Cash out their stocks. It is important to plan for that. You won't succeed overnight, and investors won't wait for you to make a decision.

Many startup folks have big struggle after they succeed. They can not choose whether to

1. Sell the business

2. Keep running the business

3. Give up shares and letting others run it.

Option 1 will give you some one time cash. Option 2 is fun, especially if your business is good. You can keep your hobby and have full control. Option 3 is a path for all investors to get rich, by giving up control. The company will be driven by the stock market valuation. The instinct to grow will take over the decision making of products.

The McDonald brothers built the first restaurant. It was very popular. Ray Kroc wanted to take the company public and expand, but the brothers did not like the idea. They fear they will lose control. Eventually Ray Croc kicked the brothers from the company and settled legal disputes with money. And the rest is history.

While you are still thinking of starts the investors are already focusing on the exit strategy. Why?

There are two reasons.

1. The investors want to turn the shares into liquid cash as early as possible. For that they don't want to get paid from the profit you make. They want the next round investors to pay them cash.

2. The only reason that the next round investor will come in is because they know there is still another next round. The last round investor pays the most amount of money since business is growing. They typically want to exit to the public market. The final round investors would actually want to buy out the earlier rounders. They simply have too much money to invest.

However, many entrepreneurs want no such large operations. They may need a small egg-laying, profit producing company that they can use as a second source of income. It is called a life style business or hobby business. In this case, there is no way you can get investment, because your exit strategy does not agree with the investors.

Are you creating a business? a public company? a hobby? or a memory? these are serious questions a founder need to choose.

Knowing the exit from the beginning is crucial. It determines:

1. Whether you need to quit your job right away;

2. Whether cofounder will be on board and quit his job;

3. Whether investors will be on board.

It is not good to just have a "best effort finish".

This is why designing the exit is critical from the beginning. Even if you are individually rich you do not have the amount of capital to fatten up a startup. In the end, you must allow the investors to dictate the terms and trajectory.

Power idea generator

L43 Use power ideas not your ideas

To be entrepreneur, use power concepts to make power ideas. Don't try cute but small ideas.

To startup, use powerful ideas. Don't use your idea.

Many entrepreneurs want a one of a kind, perfect, great idea.

In fact, inventing a new idea is like inventing a new form of sports. You might just become people's laughing stock.

Why better ideas is a trap?

1. Better ideas won't necessarily win anything, because there are hidden forces trying to defeat you. The force will be hidden until you start.

2. Most people's good idea is based on guessing. No guess and chance taking will work in business. Ever tried to buy a lottery ticket based on a smart combination of numbers?

3. A great but small idea will just develop into a small business that has no profit and staying power. It helps no one.

4. Advanced products are fun, but they may just be a fringe. Before Tesla, electric cars were a fringe. Elon Musk made it sounds like a good one.

5. Every idea is already taken, especially advanced, fancy and exciting new ideas. Don't spent time trying to beat the crowd.

There are three reasons why people with good ideas may not win.

1. Nothing you offer is needed. The world is saturated, at least in attentions.

2. Good ideas are hard ideas. You can not lock up rights to an idea and then have people help you.

3. Good things need timing to realize. Just teaching enough people someone is good will take time.

For business, ideas are not even necessary. The big ones are very limited. Say electric power, train, air travel, insurance companies, popular restaurant chains. Need more? Business is just buying and selling. If you can make the things you sell, great. But it is not necessary.

Even making a market and making a funnel is still business.

Business don't need ideas. It just needs capital.

We talk about six power concepts. But here are other ideas we will not cover:

1. Make markets.

2. Make funnel and help people marketing.

3. Use turns.

4. Sharpen your customer focus and serve sub markets.

5. Follow the buyer. They won't follow you.

6. Facilitate relationships.

7. Give people safety.

Give you some examples.

1. Make markets. Amazon, Wholefoods, Wall Street are markets.

2. Make funnel and help people marketing. Google is a funnel. It does nothing but attract people.

3. Use turns. ChatGPT caught a great turn. Microsoft, Apple and Intel all caught the micro computer turn.

4. Sharpen your customer focus and serve sub markets. Lululemon made women's clothing for Yoga. There are plenty of sports wear maker, plenty of women clothing stores. But no one focus on Yoga cloth for women.

5. Follow the buyer. They won't follow you. If you want people to pay you, make what they already buy. It is a lot easier than inventing a new concept.

6. Facilitate relationships. Starbucks does not sell coffee. It facilitates relations. All TV stations facilitate relations. And they get paid handsomely.

7. Make people feel safe. Any kind of insurance company, banks, real estate and investment make people feel safe. People want to buy safety.

What are some wrong ways for an engineer to make an idea?

1. A gadget focused company, a one trick pony;

2. A technically superior company with advanced unproven technology. Research and development costs money. They don't make money.

3. Make anything that you know nothing about the customer. With a component for a business buyer, when you don't know the buyer. Anything looks easy and innocent.

Start your journey and you will eventually bump into a powerful idea. Don't try to waste all the time to come up with one. Good ideas tends to jump out and meet you.

If you want to make a business, make a business. Don't spend all time making an idea no one will care.

L44 Entrepreneur Power Move One: Use big ideas

To get a big idea, you need to start with a big concept.

If you think from the fringe and niche, you may want to rethink the strategy.

If you think about doing something you can alone, think again. If it is too easy, it is likely a trap.

What does a big idea mean?

1. It is related to clothing, food, housing, and transportation.

2. It involves something latest about these and their supply chains.

3. It involves news and entertainment.

4. At the end of the journey, the business would be for everyone on earth.

Amazon founder Jeff Bezos started to build an online store. He started selling books on line, and then he sells everything to everyone.

Google wanted to remake a global search engine for all and the new yellow page business index. They started as a nifty search engine on table top computers. Then they become an advertising agent on all platforms.

Elon Musk does not care that electric vehicles have failed before. He knows everyone needs vehicles. Everyone in the world wants a car or can use one.

Microsoft founder Bill Gates imaged a computer on everyone's desktop, at a time no one sees that. Everyone needs an email, a Powerpoint for making presentation, or to play solitaire.

There are four signs you are thinking small.

1. Your plan is to make a product or an object. It is object focused.

2. Your plan is see if you can get funding. You want to sell any idea and see if anyone likes it. It is based on taking a chance with a guess.

3. You are at the forefront of research and discovery. It would involve too much cost to mature.

4. You are thinking outside of an existing supply chain. You are trying to come up with an idea no one has tried.

If your idea or pitch involves any one of these, you are guaranteed not to get warm reception from investors or customers.

A small idea is a gadget, a widget, or something outside of main stream or supply chain. People with small ideas are often called idea man. They are not grounded. They do not focus.

As entrepreneurs, do only big things. Small things belong to companies that are already there.

Why not small things?

1. Small things still take big money that you don't have.

2. Small things won't get investment.

3. It is unlikely you thought of something no one else has thought of. A small idea is likely an discarded idea.

4. A small idea may take off quickly, but it will hit the ceiling of growth quickly.

Why it is actually not possible to make a business from a product? a single product is never a foundation of a business.

A small idea may sounds useful and good, but it is financially unattainable. It may sound to you that you only need small amount of money but that is only because you underestimate the real cost of industrializing a concept.

L45 Power move – only propose disruptions

As we discussed elsewhere earlier, small improvements never work. It is not your business to make small improvement.

Many people can offer improvement. However, the job of improvement belongs to the entrenched companies. They know the market, they have the connections. If they are not improving, it does not mean that anyone from outside can.

What is a disruption? a disruption is a brand new path. It is called a game changer.

The Chinese has a saying "pass at turns". The disruption is the turn.

Disruption reveals the future briefly.

Let's look at some examples.

For example, many people tried to invent the light bulb but only Thomas Edison succeed at making long-life bulbs. His secret is a new vacuum pump technology that allow higher vacuum to be pulled. The invention of a mechanical pump has nothing to do with the electrical device, but it is the key.

Elon Musk used the disruption of lithium battery to make electric cars.

Jeff Bezos used the internet to disrupt book selling.

The micro computer and integrated circuits was a disruption that gave young founders of Microsoft and Apple their opportunities. They beat IBM and Xerox.

Disruption may not be technology. It could be a new demand that was not there before.

nVidia used the Moore's law and the popularity of first personal shooting games to disrupt video processing chips. If it is not for the first person gaming, the video card market belongs to Intel.

The disruption can come in six flavors:

1. Political change.

2. Economic change.

3. Societal change.

4. Technological change.

5. Changes of law.

6. Environmental.

Ariana Huffington use the new media format of blogging to launch a new daily news channel called Huffington Post. The blogging is a new societal habit.

The video conference software ZOOM enjoyed tremendous success during the COVID lockdown period. The COVID gives a new environment.

When Bill Gates started Microsoft, he knew that IBM was being threatened by antitrust authorities in the United States. Therefore, IBM can not just shut him down like usual.

After COVID lock down ended in the United States, many landlords increased their rents by taking advantage of the inflation environment.

Business success requires an engineer to have peripheral vision. The disruption and the intended use are from different fields.

Startup takes disruption, not just hard work and continuous improvement. Why?

1. The disruption is your timing and unfair advantage. It is even your advantages against entrenched players.

2. Disruption offers brand new benefits or dramatic lowering of costs.

3. Disruption introduced fast changing new demands.

Disruptive change is not perfect, but it is 10x better in some area.

Jets disrupted railroads. It is 10 x faster.

Railroads disrupted horse carriages. It allows ten times long distance travel.

If business is a river, then the disruption is an earth quake. After the earth quake, the river might change its course. Without the quake, it would take tremendous amount of money to do the same thing.

Entrepreneurs don't have to make change, but they must take advantage of change.

Why do disruptions favor young people? For two reasons.

1. The old players can not change fast. Old entrenched players already have customers.   They can only make changes very slowly. They don't want their customers to leave them. Young players have no customers and therefore nothing to lose.

2. Young people can simply meet more disruptive events in life.

Smart people do not make future. They see the future before others.

Great entrepreneurs don't just think. They look.

This is what you hear others say, fortune favors the bold. The investors know this and they don’t want to hear small improvements.

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Only game changers are needed.

> Biography of Marc Benioff, Founder of Salesforce.com
>
> History of Salesforce.com startup and growth
>
> Founder of Zoom Eric Yuan
>
> Google's purchases of small firms
>
> Companies acquired by facebook

Entrepreneur Power Moves: Make an acquisition target

Most people are familiar with the Initial Public Offering (IPO) as a destiny to make money. However, there is an easier way.

One way for engineer to make a move is actually conduct a project that make you become the merger and acquisition target of a bigger company. This requires that you already know the insider information, otherwise there won't be a good match.

Many companies were formed ex- members of the company. They were created because the founder is very familiar with the industry and market. Here are some examples:

1. Ex Oracle veteran Marc Benioff formed Salesforce.com, which was a project within the original company;

2. Ex Cisco employee Eric Yuan formed Zoom;

3. Ex Intuit executive formed Taxbit, a tax reporting software for bitcoin industry. The exit plan is to have Intuit later acquire the company.

Why would big companies buy small companies?

1. Big companies have internal politics and organization struggle. They may want to do internal startup but it may be a losing cause. They would rather buy fearless startups.

2. Big companies can not take too much risk. They would rather pay to buy smaller companies after it has proven the success.

3. For big companies to do what the startups do might actually cost more money. Buying is cheaper.

You don't have to make a company that go IPO. Going public is just to find a buyer.

You can sell your company to another company, and then you will be an employee again but with a much better title. You left a company to start one, and eventually returned to the corporate world gloriously after fighting.

Don't be afraid. But do prepare, including financially.

Entrepreneur Power Move: Automate business

To make a business, you don't have to guess what people want. You can sell to business.

Often business does not sell to consumer directly but sell to business units in the supply chain.

There are three scripts for selling to business.

1. Automate their business process;

2. Offer quality control;

3. Outsource part of their business.

The best way for other business to purchase your service is to automate part of their business.

Business will always invest in automation technology to make it unnecessary to use human labor. This is a long term trend that has been going for a long time. The technologies power for automation have been immense. Let's take a look at some examples.

1. Computers, automate office tasks;

2. Robots, automate factory manufacturing;

3. Internet, automate communication and make it simple;

4. Voice recognition, automates call centers and customer service;

5. Artificial intelligence will automate decision making.

Many big companies will buy automation technology. When you think about an idea, think along this line. It may offer tremendous clarity.

Business owners want automation. It is not because they like technology, but because they like cost control. They also want to provide quality control and scaling up to 24/7 operations.

The benefits of automation for a business include:

1. Reduce direct labor;

2. Consistent quality of operations;

3. Stay ahead of competition by capital expenditure.

4. Scaling of their business.

Why automating business is a better business proposition? or at least for building an acquisition target?

1. Reducing cost is dubious. You are also reducing the quality.

2. Improving quality is costly.

3. Changing price is not your decision.

Never walk to a CEO and tell him that you will reduce his expenditure. It is not his primary concern to "save money". He wants to cut costs. More importantly, he wants to control costs. Cost control is bloodline of business.

Entrepreneur Power Moves: Appeal to the eyes

What products do end consumers care? think about what their eyes care first.

Your customers all have basic sensory needs. The biggest sensory need is vision.

Here are a list of things we get from vision.

1. Survival.

2. Confirming. People believe when they see.

3. Entertainment and information pathway.

4. Excitement and sense of beauty.

There are many business opportunities reserved for vision. Movies and hollywood. News. Display. Camera. Surveillance. Tourism. Eye protection. You name it.

Vision is powerful. Humans can get a lot of information from a single picture.

Companies even spent lots of money on failed vision ventures. These include Google glass and Qualcomm Mirasol display.

Any technology related to the sense of vision is big. Here are some examples:

1. The movie industry is big. it is enjoyment for the eye.

2. TV ad computer displays are big industry.

3. Display technology such as LED is big. Even a play on meta verse is big.

4. Diagnosis and visual inspection is big.

In terms of technology for vision, there are many examples.

Steve Jobs is a genius computer maker. He makes eye candies. He makes windows so the eyes see beautiful fonts and more of them.

Generations of new technology for camera phones, displays, television, gaming graphics have been developed to satisfy the eyes.

In terms of Artificial intelligence, or AI, the computer vision attracts much more attention than voice.

Of course, this does not mean other senses are not as important. But they clearly take a back seat compared to vision. Technologies for touch and smell never really caught up, even if a lot of great talents have done a lot of work. Cyranos was a smell sensor technology company. It never caught up. The sense of touch plays a small role, for example in robotic surgery. But it remains a science fiction, not real markets.

If you run out of ideas as a technologist, turn your attention to vision. If what you know can related to vision, think about its potentials at automating or disruption. It may yield surprisingly good ideas.

Many technology finds relevance to vision.

If your technology can relate to vision, focus on vision. It is the easiest to succeed.

Popolar technology companies based on vision

Entrepreneur power move: spread to more people

Many smart engineers think of three steps:

1. Inventing something.

2. Solve some problem.

3. Results.

That is only one way. There are two surprising approaches:

1. Help spread someone else's invention;

2. Reinvent things, including things that did not succeed.

For example, electricity was invented in the 1850's, but the spreading of electrification is still ongoing.

For example, electric cars were invented by Edison, but Tesla is still working on it.

For example, NASA has space agency technology but SpaceX is inventing new rockets.

For example, do you know almost every country has its own Google? You really don't need to invent Google to get rich. If you have enough capital, you can reinvent anything and penetrate new untouched crowds.

Many successful startups did not invent something, but they popularize it.

Examples include:

Henry Ford lowered the price of car, using an old concept called assembly line, and increased the population reach of automobiles.

Zoom, the video conferencing software, did what WebEx and Microsoft Teams have done. But it popularizes the video conference concept. Of course, the breakout of COVID helped it tremendously.

The internet browser called Netscape made internet usable by vast number of people. The people who invented the browser did not invent the internet, but increased the access.

SPACEX is a rocket and space travel company. NASA and many government space agencies can already do it, but Elon Musk tried to popularize space travel by reducing the cost.

You see, you don't have to be the smart inventor that invent what has never been done. You can simply be the reinventor or the next inventor.

Lowering the price of something may sound common, but that takes capital and business acumen. It takes way more money than doing research.

Here are several ways:

1. Focus on new upscale crowd of existing products;

2. Focus on new lower scale crowd of existing products;

3. Start with high end products such as military tech, and develop new market penetration and accessing new buyers;

4. Lower the price of something. Drastically. Sustainably.

5. Bring popular concepts into another market. For example, McDonald's restaurant spread fast food to unprecedented heights. Starbucks made a popular European concept new in America again.

6. Play the cards we discussed before. For example automation. See, automating vacuum cleaner was a good idea.

Don't spend all the time inventing new things. Somethings are not meant to happen today. Focus on what works. Especially what works now.

Don't try to change history. History and future just may need you to turn the page.

Conclusions

L50 Smart is overrated

Thomas Edison said, much knowledge can not be found in books alone.

To make change, you must enter business.

The things often over rated are:

1. Smartness;

2. School and degree.

3. Passion and interests.

School is over rated. It teaches everyone who are willing to learn the same thing. It provides common knowledge.

School teaches what works. Business teaches what does not work.

Everyone is proud of their passion. But until you start entrepreneurship you have never need to try so hard yet. It is ultimate test to your passion and work-a-holism. If you don't absolutely think work is life, then you should not be a founder.

Vision without exhaustion is hallucination. Why? because the world is a competition of passions.

Entrepreneurship is a school that you pay tuition by making mistakes, and you practice by making mistakes. It is the only path to so called success but the cost is very high.

Unless you started young, unless you have an unbeatable team, don't try it.

School smarts is not an advantage in business and business starts.

First, There are all kinds of smart. Everyone is smart.

Second, Business is competition prize winning. Casual best efforts are not enough.

Third, business is a game you play with another person, on his turf. You must practice.

Fourth, no one cares about the changes you want to make and solutions you want to provide. If you can give them for free, then some might take time to try out. Otherwise, who cares?

Fifth, making products takes money. Selling products takes relation. All these have nothing to do with smarts.

Academy is sky. Business is earth.

Academy wants new. Business knows yesterday's new must become tomorrow's old.

Academy wants new and change. Business is about staying longevity. No changes. No surprises. Day in and day out. Boring. Mundane. Common. But heroic.

To make change, you must make business. Why? business is benefits, not kindness.

L51 Start with what you have, today

To be extra ordinarily rich engineer, start today.

Or you will only be ordinarily rich engineer.

To be extraordinary, you must go beyond ordinary efforts. You must travel extra.

The two things you must start, TODAY:

1. Finish a product and start selling.

2. Start to learn outside of school today. Network. Learn to sell. Build a plan and execute it daily. Learn by failing something important.

Note the following principles:

1. These have no conflict with getting good grades and doing a good job. Entrepreneurship is not an alternative to work.

2. Do not perfect the plan. Do not make yourself better first. Do not plan by reading more books. Your start will not get you success, but your start will get you to learn.

3. Your schools and jobs do not teach you management and business. You do.

4. Never try to learn this later in life by taking undue risk with no preparation.

You don't have to be an entrepreneur, but you are better off having the business mindset. You will see the world differently and appreciate people and relations better.

Why must you start today? because you have a life long journey to make.

Do you like going to the national parks? have you walked any extra long trails that very few people walk? Entrepreneurship is kinda like that.

You go way beyond an idea. Way beyond kindness. And way beyond technology.

Please allow me to explain.

You go way beyond an idea.

To have an idea takes no time. To be recognized as the owner of an idea takes much more work.

To know you are smart is one thing. To have a third party say you are smart is totally a different level.

With their hard work and hidden sacrifice, Steve Jobs owned the idea of personal computers. Howard Schultz owned the idea of fancy coffee shop. Elon Musk owned the idea of electric cars. Ray Kroc owned the idea of McDonalds.

Everyone on earth thought it was their idea. Which is completely untrue. But hey.

To own an idea is sweet. Entrepreneurship is to pay for the cost.

You are smart. You have been a good students. You already get A. You have good ideas and great creativity - in fact, too many.

To realize ideas you must have relations. You must have relations of benefits. You must have helpers. You need to have something to give to your helpers. Or no one will help.

There is no help based on kindness alone. That is not enough.

Ideas and entrepreneurship are related. Entrepreneurship is business - you must teach yourself, through failures.

The relationship will transform you. Once built, you can not leave anymore.

Entrepreneurship is a life long pursuit.

Through this your life is transformed.

You go way beyond technology.

Technology is only the start.

Technology is only the means to the end. Technology can sometimes be the new way to do old things.

Thomas Edison used a new German vacuum pump idea to pull vacuum in his light bulb.

"During 1879 Thomas Edison's Menlo Park, New Jersey laboratory developed the means to evacuate glass lamp globes to less than a milli Torr in 20 min and in mid-1880 began production of carbon-filament incandescent lamps. Among Edison's nearly 1100 U.S. patents are five for vacuum pump improvements, and at least eight others that are vacuum-related; all applied for between 1880 and 1886. Inspired by an 1878 article by De La Rue and Müller on studies of glow discharges, Edison devised a combination pump using the Geissler pump as a rough pump and the Sprengel pump for continuous exhaustion. Edison's patents described means to control the mercury flow and automate the delivery of the mercury to banks of up to a hundred pumps. Other patents described various means to remove residual gases during lamp processing."

The high vacuum allows his bulb to last much longer without burning out. In the end, the new light bulb is a new light for the night, replacing fire, candles, and gas lights. The vacuum technology played a key role, but it is really the unsung hero.

In the end, what is the ends of the means? a new light? a better light? I would argue these claims are overly simplistic. People already had lights at night. The electric light is really a future that has to happen.

See, the technology must meet the lucky use, or it is just a technology waiting to find its use.

What made Edison special is not his ideas, but his dogged pursuit to realize his ideas.

Thinking is easy. Classes that universities teach are all common knowledge. Edison actually never went to school. It does not matter.

Making anything is hard.

Making a finished product takes more than technology. it requires a lot of meticulous work and money.

Selling a product is even harder work.

This is where Edison actually fell short. He had to use the money of J.P. Morgan to sustain his venture.

In entrepreneurship you go way beyond kindness.

Business is war. Winner takes all. Dog eat dog. Hook and switch. These are all true.

The smart you have must beat other people's capital, or you will just work for people with money to realize their ideas.

Business is a fight. You fight with competitor and moneyed players.

Business is also a competitive game. You fail because you are beaten by your opponents.

Any small business pursuit has competition.

Business is a competition, like chess or soccer. It is not a math exam. There is no finals. There is unannounced exam everyday.

Business road is paved with money. If no capital, no idea would work.

Besides, as you want to make money, so do people who already have money.

The bankers, investors and distributors are more essential.

They pushed business to the level that no individual efforts alone will amount to anything.

Further, business is business. It is not ethical or for charity. It is not kind and not for kindness. It is true. Business is what life is.

Business people are professionals. They bend backward for customers and hustle for innovation, but they also stab competition in the back.

We discuss other brutal truth of business in appendix. My intent is to stop unprepared people from taking the plunge.

L52 Vision without exhaustion is hallucination

Business has no logic.

It is constant learning of new logic.

There are only truth and facts that defy school teaching and book logic. Schools teach you what work. Business teaches you what doesn't work.

Here are some.

Business is not rocket science. Anyone can do it. Smart people have no advantage.

It is extra hustle and extra credit learning. Anyone can do it as long as you stay in it for long enough.

A vision without exhaustion is hallucination. Even for Edison, Tesla, and Elon Musk.

There are seven lessons no one will bother to teach a smart engineer. Some think it is common sense, and some think you will never change.

1. You may be smart, but in business you have competitions.

Some competition are from poor, desperate people who must make a living. You are against others who are ambushing you and preventing you to win. Some are from rich and experienced people who likes to have a diversion.

It is easy to make money. You just have to beat the best.

2. Business building takes more than a bright brain. It takes familiarity and practice.

It takes money to build, sell, and scale up. It takes hustle to correct what you can not anticipate in your plan. It takes insider knowledge.

3. It is easy to make money, but only large business makes profit.

There is cost to doing business. Only large business can compensate for the cost.

4. You must learn to sell and sell your own products - no one will help you.

No one will teach you how to sell, just like no one will teach you how to fish. It is survival, not charity.

5. Business is building reliable beneficial relations. Trust takes time.

Nothing good can happen fast. Only bad things can happen fast.

6. Business does not care about technology knowledge and secret keeping.

You may have technical knowledge but building a technical product is a different level. You must make products stable and reliable. And you must prevent others from copying it.

7. Business world is not kind.

All business people are survivors. They fight everyday, rich or not. All business people are not common - they are fighter and survivors. No one needs your help and no one will help you. It is only your business and your fight. You need experience to plan and then experience to dodge the bullet.

Appendix: Day Two - Managing the business you build

Money, Profit, Investment

In business you are not making money. You are making a money-making machine. The machine makes money.

Here we talk about three things.

1. A business first is concerned with profit.

2. A business is concerned with growth. No profit, no growth.

3. Investment is what is needed to grow faster.

They are all money, but they are different. Let's talk about their relations.

Let's first talk about a business' profit.

A business can make a lot of money but has no profit. This is undesirable.

Even if people buy from you and pay you, that is not money you can keep. The money you keep is called profit. Profit making is insanely hard. The cost of doing business will drown any business people.

Many high tech silicon valley companies, even public companies, struggles to make a profit.

No one can automatically make a profit. Customers don't give you extra for profit.

If money is the score of your team, then profit is winning.

Increasing price is not a way to make profit. Increase of price has costs and limits. Only if your product is best, you may be able to raise price. Keep in mind, even Amazon, Google and Apple can not arbitrarily raise their price.

Here are three situations.

1. If your product is one of a kind, you can charge for whatever but your customers are very expensive. You must wait for them to arrive. The waiting is expensive.

2. If your product is commodity, you must pay for your suppliers. Your suppliers will not automatically give you a profit margin.

3. If your product is somewhere in between, you must fight on two fronts. You must increase your price through value making, and you must reduce your cost through volume growth.

The second thing a business person cares is growth.

Without profit. there is no growth.

Without growth, there will never be profit.

Business is all about the growth. If a business does not grow, it will have no profit. It might be a family business or life style business.

Growth is all about cost control and pivoting.

You must change constantly even after you succeed with startup.

Investment is needed to help with growth.

Founders build the machine. Investors sell the rights to the machine.

Founders build the profit. Investors sell the company to other investors. Otherwise, why would they invest? there are no such thing as angels.

Investment at the start is called seed. When a business is fully grown, the investment comes in the form of bank loans.

Brutal Truth: Only big business has profit.

Do you ever wonder why so many big container boats go to China and bring back gazillion tons of goods to sell in the USA?

Would a smaller operation be better?

The logic why big business makes profit is as follows.

Price is a function of the size of the order. Retail customers pay the highest price and whole sellers can expect much lower price. The difference of price incentivizes the whole seller and stores to act as distributors.

For business to get to net profit but not arbitrarily raising the price, the only path is to lower the cost. Your negotiation power with your supplier is dependent on the volume of your order.

Business must grow, or it starts to shrink and die. This is because when the size starts to shrink, your cost will increase. You are no longer the favorite customer for your supplier.

Even big companies must grow. For example, the stock price of a business is typically taking into account of its growth. When a company's growth slows, even if the business is still strong, the stock price drops. The CEO's paycheck is immediately affected.

The consequences are:

1. In business, you grow or you die;

2. In business, the winner takes all. The second place finisher in any market gets nothing.

If you don't believe it, look at the relationship between AMD and Intel. AMD was trailing Intel for the longest time.

This bring us to a concept called small business. A small business is typically solo owned or family owned. It will never seek public listing or only do so symbolically while maintaining full control. It does not have potential or interests to keep growing.

What defines a small business?

1. Champion in a niche that is small enough to have profit, even if the capitalization is low.

2. Relatively small total market and immune to competition from big players.

3. Typically has some elements that resist automation.

Examples include a local restaurant, a specialty product maker like car seat protection, necklace, shirt buttons, etc.

Chicagoan David MacNeil founded a car floor mat company WeatherTech. MacNeil started WeatherTech out of his Clarendon Hills home in 1989 after returning from England with an agreement to import car mats, eventually bringing production in-house and moving operations to Bolingbrook in 2009. To grow, he even run advertisements in Super Bowls. However, there is also a risk to that. For example, the China factor.

In the case of WeatherTech, the ability to customize a mat for each car is an ability that does not transfer easily to China.

Other names are:

1. Purveyor.

2. Establishment owner.

3. Franchise owner.

A small business focus on a very well defined niche and dominate that sector. It becomes the niche champ, sector champion or city champion.

Many Taiwan, Germany and Japan companies are like this.

Such businesses are everywhere, just like small trees are everywhere. They can be a comfortable life, but always at risk of losing out due to change.

Change events include:

1. Owner retirement;

2. Disruptive technology such as internet

3. Will never have capital and funds to grow out

4. Always at risk with loan guarantees, rent, local government and politics.

Related topic:

1. Focus precisely.

2. Think about the exit.

Only the leader has profit

Business is a brutal competition unlike academics. You must finish first. The first have

1. Pricing power
2. Largest volume and hence lowest cost

(reverse adding to udemy)

Advices for entrepreneurs of all ages

Advices for computer science majors, engineering college students, professors and 45 year old engineers.

Advice for computer science majors

Computer and software majors have one major advantage. You must use it.

You have two big advantages in this major.

1. Your product can be made with a computer alone. You don't need to rent factory, don't need to buy heavy machinery.

2. Your products can be distributed and sold without cost. People can just download it. There is no shipping fee, no packaging cost.

Look at all the people who succeed, they often made software.

Marc Andreessen made Netscapes.

Jeff Bezos programmed a website and arranged someone to dropship books.

Bill Gates made and sold software. He even managed to sell software he did not own.

You are the envy of all other majors, because you can make and assemble your own products.

Other majors need heavy capital. you don't.

Certainly it is not easy to make a finished products.

1. You need to program backend and front end.

2. You need to code database and algorithms.

3. To make a full products you need to code many parts. This exceeds what a typical code genius can do. You need to hustle like a monster for a few months, and then count on your luck. The successful entrepreneurs all had luck on their side. There were plenty of competitors.

Certainly if you make it big, you still need to pay for servers and SEO. It is not cheap to get traffic. But everyone else would encounter the same issues.

Advice for college engineering students

A vast majority of great entrepreneurs started at college age. College dorm is a great place to experiment.

Bill Gates started in college.

Marc Zuckerberg started in college, so do Steve Jobs, Steve Wozniak, Marc Andreessen.

Even the founders of Dell Computer, Subways and Domino's Pizza started from college dorm.

However, many did not succeed. Some succeed only modestly. And there are surely many failures never reported.

In college you can recover if nothing happens. You are experimenting even before formal job and income. Think you are taking extra credits on your own.

In college you can make and sell a lot of things.

1. You can sell computers;

2. You can assemble and make drones;

3. You can turn your college projects to business;

4. You can make and sell food.

College is a great time to get your foot in the door of big business. But never do something small. it will only end small.

Some ideas:

1. Make something you can make alone, or with one partner;

2. Make sure the added value is high from parts assembly;

3. Make sure it is not a time sink. You can not afford it.

4. Make sure you focus on a niche but the total market is big. Don't try something that will end small. However, start small.

45 year old entrepreneurs

Many people try something daring at this age. It is the so called myth of mid life crisis.

People realized what they have been doing won't make them rich and happy. They want to try something new.

However, here is the bad news. At 45 years, you are too old. Pardon me for being to honest and blunt. But what I am saying can avert a disaster.

Michael Jordan did not start to train for NBA career at 45 years old.

No business is a walk in a park.

It is debatable whether someone should start at this age. Your advantages include:

1. You have engineering experience in an area;

2. You have life experience.

3. If you are lucky, your kids have grown up and ready to leave home.

However, there are many disadvantages that were never fixed. These include

1. You do not have business sense, even when you have worked in a company many decades;

2. You do not have business building experience and have not failed;

3. You do not have industry management experience;

4. You do not have whole product building experience;

5. You do not have business running experience. You were never assigned to work on real business decisions.

6. You do not have credibility for getting large capital funding;

7. You do not have marketing and sales experience. You can not estimate the cost

None of these can be fixed by reading some books. You can only learn by experience and repeated setbacks and failures.

Business is largely business sense and it is self taught.

Most 45 year olds do not have time to experiment and fail many times. Time is not on your side.

Here are some warnings:

1. Never take your job for granted. You may want something better or more challenging, but you never knew the cost of older generations of entrepreneurs had to build the company that offered you the job and position.

2. Never try to get more money. People who promise you more money is just fooling you. If some promises are too good to be true, they are not.

3. You might see a lot of open opportunities and are tempted to take a chance even if you have never done this sort of things before. However, you are the last person to know the degree of difficulty to pull off the easiest ideas. You don't know the cost you are required to pay.

Advice for professors starting business

In academic world no one is more worshiped than professors. They are considered geniuses. They are often called genius and father of fields. Would they succeed in entrepreneurship if they choose to do that?

How can the father of a field fail in the industry that spring from his research?

All professors are creatures of the comfort zone. Their prevailing attitude has two components:

1. I am smart and educated. After all, I beat all the odds to become a professor. My students who are not that good go to industry.

2. Business is common. You are advanced. There are so many business. There are so few professors.

They don't know anything about the deep knowledge or industry, but they would assume it is not too hard.

Naturally, professors who try would get a surprise. Here are some real examples I encountered.

1. Prof. C.M. build a DNA cancer detection company. It burned through 100 million dollars of investor money. The technology is so much more sensitive than the current state of the art. It had no customers after eight years.

2. Prof. K.P. took a leave from Berkeley to start a company. His students formed a competition company. In the end his company lost and had no profit. His students' company worked. Prof. K.P. went back to Berkeley.

3. Prof. K.G. of CMU and Prof. T.K. of Stanford both were directors at DARPA. They worked with so many companies and VC. They are the father of the field. Eventually they got their VC money to try to commercialize their lab products. They failed miserably but both can return to schools to continue teaching job.

4, Two people I know left prestige national lab jobs, expecting their research to become a walk in the part for company building. They are living lives far from former comfort now. One's air sensor company failed to catch on, and another's endeavor becomes a small business of two employees.

5. In the 1990s, in the height of internet bubble, over 30 academic teams went on to build an advanced switching device. They were trying to beat an old technology. "So old", they think. Too bad, the old technology improved their performance and every startup failed to catch the incumbents. The old technology survived a challenge.

Professors don't have real advantage, even though you are the most advanced. Why?

1. Your business sense and skill is next to none, but you did not even know it matters.

2. You think if you get off the pedestal and go into the ordinary world of business, you would be like a Michael Jordan playing in the high school tournament. That is wrong. There is no such thing as a high school league in business. Every business is major league of its own kind.

You are in a dilemma:

1. If you do not quit your job, you will never really learn.

2. If you do, you will lose everything since you are so badly prepared.

Why advanced research does not turn into business advantage?

1. Your intellectual property has not been proved in manufacturing world to be feasible and reliable. It would take a lot of time and money. No one can make money from your invention, hence you can not make money from your invention.

2. You have no insight into the business industry and market. You can only guess what people need or not. You can not simply expect to hire people. If you don't know something, you never know if your employees is doing OK or not.

3. Sometimes you are actually lagging behind the industry. The industry has picked the low hanging fruits and started to make money. The things you do are the toughest to commercialize and requires the longest run way. Not even people with experience would try it.

What are fundamental differences of university research and industrial research?

1. UR is for tomorrow. IR is for immediately result today.

2. UR is done with small budget, typically sponsored by government since it is so risky. IR is done with big budget.

3. UR is proving possibility. IR is prove customer benefits and reliability.

4. UR is to show what can be done. IR must prevent others from doing the same things.

5. UR makes one part. IR is investing in high volume production

6. UR is for interesting novelty that has never been thought of. IR must answer the question "who cares?". IR is the first who makes reality out of novelty.

7. Professors are not connected to industry. They tend to develop solutions but don't know the problem. There are no killer applications. Industry is opposite. They know applications and customers. They screen for solutions broadly.

Academics live by classification of fields.

Business live by classification of industries and markets.

People in fields offer theories.

People in industries seek acceptance.

Academics create knowledge. Industry creates know how.

Academics deal with abstract and general. Industrial deal with details and refinements. They are grounded in user benefits.

Academics are funded by government. Industry is funded by demanding users and beneficiaries.

Academics teach. Industry learns.

Academics works in deep thoughts alone. Industries seek deep connections.

Academics prove theory. Industry proves utilities by having people pay.

Academics' work ends in proof of concept prototype. Industries makes products that customers can complain and return.

Academics are in comfort zone. Industries are forever paranoid.

Academics protect ideas. Industry protects turf.

Academics and industries are really the two ends of the same thing, but the time for translation is too long for individuals.

Academics pleases a small circle. Industry aims for much bigger impact.

Academics think and design. Industries produce.

Further topic to consider:

Technology readiness. Tech readiness.

Entrepreneur Math and Logic

L61 Volume, price, cost, and profit

Business does not automatically leads to rich. To be rich, you have to select well and be good.

Your business is associated with exclusivity, large market size, and leadership role. Exclusive. Large. Leader.

To get profit, you can increase the price or reduce the cost, or do both.

To get lower cost, you have to increase volume.

To increase price, you must provide exclusive benefits.

Price is flexible.

Price is related to value, but not cost.

Value depend on your chosen customer base.

It is hard to ignore the fact that in 2023, the world top riches are the families of Bernard Arnault. More than Jeff Bezos, Elon Musk, Bill Gates, and Larry Ellison. The family sells luxury good. Apparently there is a small customer basis. The pricing power comes from exclusivity.

The second richest is Elon Musk. His fortune is due to selling luxury cars to selected customer.

The third is Jeff Bezos. His company sells things to the entire world. Arguably his company sells to everyone in USA.

All of them have large TOTAL ADDRESSABLE MARKET. The entire world is potentially their customer. Their ability to get profit are different.

Arnault command the price.

Elon Musk does not comment high price anymore, but his shipping is increasing. He is also controlling the cost and increasing the volume, even when the price has to drop.

Jeff Bezos does not control price, but it does make money from Amazon Prime membership. They reduced the price of shipping.

The Amazon prime subscription is a unique business idea. It is a money maker, and a valuation stabilizer.

- Amazon's subscription business is showing strong growth despite earlier concerns about market saturation.
- Year-on-year growth in the recent quarter showed a jump of 17%, which was higher than the last four quarters.
- The recurring revenue base of subscriptions is a strong bullish trend for Amazon as it allows the company to introduce new services to its customers.
- The subscription revenue for fiscal year 2022 was $35.2 billion with a higher revenue share when compared to the overall revenue base.
- Even with a low teen growth rate, subscription revenue could hit $100 billion by the end of this decade, which makes this segment a key driver for future valuation growth.

The richest man in China in 2023 is Zhong Shan Shan. His company sells bottled water.

The fact that Jeff Bezos and Arnault sells luxury prducts is not dragging down their networth. The market they are in is big, that has big total addressable market lure for investors.

Total addressable market is not how big you are now. It is how big you CAN be.

The key to be rich is to be sole source of highly desirable products or services. Both desirability and price comes from clever hard work and right culture.

Also clearly, you must be the clear leader of your sector. Bar none.

L62 Buy, make and sell. That is business.

No one is in business alone. Nothing you offer is needed if you are not related.

All business is buy, sell, and make. There are the following connotations.

1. Buying and selling is business.

2. What you must have on your own is a product and a store. You must have your service or product. A service contract is called a "product". You must guarantee with promise and perpetuity.

3. You make money together. You depend on others.

4. Others depend on you. You are a buyer and provider. You give others business.

5. You help others make their products.

Take a look at this picture taken at this railroad station. There is a store selling products, coffee, and deli. There is a railway station, and there is a major crossroad. There are people at the station. They are wearing products - clothing, shoes, backpacks.

You notice the following:

1. The road and railroad the government build brings traffic to the store.

2. The store helps sell products made by many companies. The profit they make by carrying the products such as chewing gums and tooth paste help sustain the store.

3. Factories in another corner of the world makes the shoes and clothing. These products have a logo. Some famous, some not.

4. The shoes with famous logos are more expensive, but their cost at the factory is much lower. The price differential incentivizes people from distributing and carrying the products. The money this person makes in an hour will buy a pair of shoe at retail. It is a pair that is made by many workers in Asia and shipped by many workers. There are many hours of work involved. Are you amazed that it is actually affordable?

5. There is an ice box selling ice in front of the store. The ice is not made by the store, but by a separate company. The store helps the ice maker sell ice. The ice maker gives the ice to the store for a much lower price, and allows the store to make some money when the ice is picked up by a customer.

You will also notice, that even the railroad offers a schedule and own ticket sales network. They do not sell the tickets in the store. Selling your product is your own business.

You notice these as well.

1. Without the road and rail road, the store is not there. It won't make money.

2. Without the store, everyone who provide merchandise to the store won't sell as many items.

3. If all customers insist on wearing shoes and bags with no brand, the price won't be too much cheaper. It costs real efforts to make a pair of shoes in Asia and ship them here.

4. Every one and consumer has to spend money, but they all want to save. They buy house mortgage, taxes, railway tickets, and food. They bring many residents in this town jobs. The consumer's job is to consume, so others can keep producing.

5. This is outside of this picture, but even the shoe maker in China has to by shoe laces and materials from their suppliers.

In business, people form a bucket brigade to make money together. It is called

1. A supply chain;

2. A distribution channel;

3. Middlemen, if you only buy and sell; Without the middlemen putting in some efforts, nothing will sell. For example, the real estate agent advertising on the billboard is a middleman.

4. An ecosystem, where everyone helps each other. The store helps the government, and the government helps the store. The railroad helps the commuter, and the commuter helps the railroad with ticket purchases. In the end, people buy houses here and pay property tax to the government.

People don't invent a brand new business, because the actual cost will be too high.

Business is how the world runs. It is how the life runs.

Without the brigade, everything will be unaffordable.

And one last thing. Don't hate the brands. Without the brands organizing the supply chain, the world is isolated and everything will be prohibitively expensive. This is how capitalism works.

To be honest, most business is just buying low and sell high. And people don't care much about new ideas.

L63 Funnel and conversion

Why do all the shops locate themselves in high rent street side real estate?

The answer is, those places have high foot traffic.

Why is foot traffic important?

To sell your product, most engineers would guess confidently, make a prototype, and try to ask people for opinions or approval.

This in theory could work, if you ask a lot of people.

The correct way business do it is to build traffic, have browsers, and convert a certain percentage to buyers. This is called a funnel.

You must first draw foot traffic, then draw store visitors, and then draw people to buy and pay the price. Even if people want to buy they may not buy it today. Big sales can only happen on busy streets.

There is nothing that everybody will buy upon seeing it.

Funnel is also a business. Business will pay them. They don't charge visitors, but they only draw visitors. For example, the following are all funnels:

1. Public street and highways;

2. Newspapers;

3. Websites that charges you nothing;

4. Radio stations in cars;

5. Sports events and concerts;

6. Yellow page and any listing of business.

If you have 1 million Tiktok followers, how many sales can you make?

The answer is. One to ten.

For a Tiktok fan to buy from you, he must

1. Click your tiktok thumb after seeing it;

2. Visit your site and evaluate product specifications;

3. Decide to buy and pay.

Each stage you lost a lot. For 1 million fans, you can sell 1-10 items.

Don't believe? I have real data. **I advertised a course on a 2 million member site (Entrepreneurship mindset) and a 220 K member site (Startup step by step). Over a course of 7 days, 1 out of 10 followers "viewed" the thumb, and 1/1000 of views turns into clicks. Out of the clicks, 1 out of 10 buys at heavy discount.**

Why so low?

1. Most fans saved you for your contents, not to buy things. They are not that interested in you. You will lose a lot of interests when you try to sell to fans. Some might just skip your thumb.

2. Of the people who sees your thumb nail, every 10,000 impressions will result in 1 sale. Basically, 100 impressions will produce one site visit. 100 site visit will result in 1 sale.

This is assume you already spent the time and money to

1. Have a follower base;

2. Built and acquired products to sell.

If your store is physical, then you must draw people from side walk to your store interior, and draw store visitors to a buyer. Mostly the conversion rate is 1% for the people who browser your window will come in, and 1% - 10% who come in may leave with something.

For digital stores, the conversion rate is as follows:

1. 1% of people who sees your page thumbnail may visit. This is called an impression.

2. 1% who land on your page may buy.

Overall, you will have 1 purchase for 10,000 impressions. You either buy those impressions or have them presented organically based on people's search.

Most big sites like Shein and Temu create 100s of million impressions a day, and try to result in 1000 to 10,000 sales.

Now at least you know why the spam callings on your cell phone are so persistent, and why spam email generators can get rich.

L64 What is value and how to make value

Value is a vague term. Or is it?

Business means greed, but to get rich you must provide. The ultimate source of money is from the end consumer, and your supply chain. You must be valuable to them.

As the Godfather says, you must be indispensable in business.

Value means three things.

1. It means your work by hand. Your physical work is value. Your time is most valuable. Everyone has only 100 years, rich or poor.

2. To customer, it means the price is worth it. The value makes price low and pleasing.

3. Value must be connected to the receiver. Different people value different things.

The relation of a company to its customer is one of value and benefit providing. On tops of satisfying the need and want, the customers must see value. An easy way to understand value is that a customer only pays a price to keep your product if they see a value many times over. You are essentially running a large discount scheme for every sale, everyday.

To be honest, value means the price is below the cost.

Value means you are hard to find. You are hard to find because of results of your exceptional work. For example, Michael Jordan is the most valued player many times, and he is also the highest paid.

If you don't believe it, look no further than Amazon. An Amazon buyer pays low price and zero shipping cost, and yet so many shops in Amazon competes for its business. That is the power of customer, and they have many choices other than Amazon. So Amazon must bend over for keeping them happy and not going anywhere else.

A company that forget to please the customers will be labeled arrogant and will soon disappear from the face of the earth.

Value is real. It is not an empty slogan for business.

Value is free stuff you don't charge your customers with.

You may realize it is hard to do so. Why would business still do it? There are two reasons:

1. Because when there is volume, there is still tremendous profit.

2. There is tremendous benefits to have organic foot traffic.

A business is rewarded not just from profit. Other sources include

1. Stock market;

2. Ownership of land.

3. Brand power.

When your company provide more value relative to competition, it means your company have good people and good culture. Here, the word value also means work force value alignment.

How to make value?

1. You work. Work hard. Value is time spent, including Jordan and Kobe. In the end, quality of your work is value.

2. You make things others can not make. For example, you get results no one can get, including getting low price no one can achieve. Then you can charge more.

What are some examples?

•You have special talent

•You have special connections

•You are willing to charge low price

Value is connected to your price.

If your price is 1/10 of the value, customers will pay your named price to keep you.

No business can name their price. You provide higher value, you must charge a higher price. The only exception is when you are hard to find.

Michael Jordan is not paid well because he won an award. He is valuable hence he can charge more. Jordan's hour is just like everyone else's hour. But he can charge a higher price for his hour.

There are two strategies for long term value.

1. Keep price low. Or lowest.

2. Keep yourself most exclusive.

For example, China and Amazon's talent was keeping the cost low. That is why Walmart is valuable. That is why Walmart valuation is high. China is also valuable, because it provides labor for the lowest price. The ratio is high, partly because the price is low. Later, the quality also improved, making the value even better.

Tesla and Louis Vuitton keep themself out of reach of most people. But for their customers, their price is still low.

Some keep their price low. Some keep their value and exclusivity high.

This is why people pay your price. Value means the customers will keep you, not just evaluate. Remember, price is not related to your cost. Price is related to your value.

Value only exist in a relation. No relation, no value. No one cares your talent.

You work hard enough to bring a customer low price, you must really value the customer's money. And the customers know.

At the end, we must discuss the role a company plays in the supply chain. Good companies add value. They command the most price differential in the chain.

With china price so low and Nike shoes expensive, is there anything wrong? No. Nike brand added value. Not all folks buys Nike shoes. But the ones who buy don't want to buy cheaper shoes.

When it comes to hard work, being exclusive, and over provide, every business is the same.

Let's look at the diamond. A diamond is more expensive if it has more cuts. The cutters have a low price for their hours. They are common. Talent commands a higher price. However, talent alone is nothing.

This relate to you, the engineer. Good talent must make them indispensable in a relation. If you are diamond in a rough, you still need to be found and appreciated. Or you remain a diamond in the rough. You are still successful, but such success is common.Good talent must make them indispensable in a relation. If you are diamond in a rough, you still need to be found and appreciated. Or you remain a diamond in the rough. You are still successful, but such success is common.

L65 Long term profit and soft skills

What happens to a company after the founders leave? This is a crucial test of the founders.

Anything that can not go perpetually will stop at some point.

The name of the game for business developer is to build a machine that won't stop.

Many people believe naively that business earn profit by exploiting others. This is not true. Although some elements of exploitation exist, business that exploit does not form long term profit basis. It may work for a while, but not for long.

Some people believe business makes profit by charging proper price. That is not true. Business typically charge a price below cost.

Business is like a river. The founders make the river. Rivers can go up and down, but it always helps the surroundings, the upstream, and the downstream.

With these constraints, business must use culture. Culture must achieve three things.

1. Control cost.

2. Maintain leader position and volume.

3. Do pioneer innovation successfully.

Why is culture and top leader important? What would happen if it is bad.

1. Bad people will be hired. Good culture ensures right people are hired to hire the right people;

2. People will lie at work and play politics. Good culture ensures honesty and agile reaction;

3. Good people will leave. Good culture ensures talent retention.

4. In time of dramatic change, the company will stay on course by inertia. Good culture ensures reaction to changes.

Ultimately the founder must pass the management to others. The soft skills involves people skills.

No matter how big and comfortable a company is, it is a group of like minded people pleasing customers.

Bad stories of bad management are everywhere. But they are never told.

Bad companies are described as arrogant, toxic, and dinosaur. Ultimately, no leaders. No innovation. The company will lose the lead position, and slowly becomes irrelevant. No one cares. There is always a new kid on the block to replace you.

Rest assured, nothing last forever. Great companies like Westinghouse and GE will all decline. Even countries will go up and down. It is the business cycle, and even best innovation can not fight it.

Ever wonder why Intel's valuation is only 1/5 that of Tesla?

Grow your company baby.

Appendix: Brutal truth rarely told and understood

Brutal truth: Business is rigged survivor game

Most well schooled people do not understand business, the logic, and the process.

Think of business as a chess tournament. This way what I am about to say does not sound overly negative.

Business is war.

Business is a rigged game.

Most business is started when people made a bad judgement, or were forced to do this, and then survived.

Most business only makes a living. Not money.

No business is ordinary, even the most ordinary ones.

Every business must fight to survive daily. No business is completely honest, kind, and noble.

Entrepreneurs do not live in townships.

They are wilderness survivors.

Don't blame the companies and the business people.

Entrepreneur life is never comfortable. No matter how much money you can make at one point.

If you did not believe it, then I hope 2023 taught everyone via the daily news.

1. Silicon valley lost hundreds of thousands of good paying tech jobs because business environment changed over night;

2. The Silicon Valley Bank, among many, fell over a matter of a week.

The following companies all experienced business decline or stock price drop. Google, Facebook, Intel, Amazon, Apple, and Tesla.

Why is business rigged?

1. Good business is hard to find. People protect them with all their innovative talent.

2. Business world is rigged with know how, trade secrets, laws, and regulations. This is to prevent new comers from touching down.

3. No matter how small a niche you enter in business, expect hidden landmines and ambush forces. They never broadcast their existence in school books.

Business is war.

People with business mindset are the ones who actually fought on the front line.

They are the ones who tether the relationships and negotiate the benefit exchanges.

The arm chair generals, the military school students are not soldiers. They are supports.

Same thing in a company.

The managers and engineers are just supports.

Most of the "startup failure" are borne out of fear. In wars there are death. In games there are defeats. Veteran soldiers are not afraid of death. They have dodged a few bullets.

Concepts:

Game. War. Not comfortable.

Brutal truth: Business always fight on the edge

People in business always fight on the edge.

Very few people on earth are mountain climbers. Very few of them go to Mount Everest. The vast majority of them go to the base camp and then give up. The most heroic few go climb to the top.

As someone gets close to the top, he will discover a line of people, shoulder by shoulder, walking on the only path known. And this is only the line for the day.

Business is like this. Every business fight on the edge.

What does it mean to fight on the edge? There are three behaviors.

1. Every small insignificant business has competitors fighting for win;

2. There is cost of everything that prevent business from making profit;

3. Only one at the top can raise above the water.

What are the consequences for fighting on the edge to win?

1. No business is easy. There appears to be endless business opportunities and ideas. But that is not the case in reality. Valuable business opportunities are tethered to the consumer spending and demands.

2. If there is no fight, you know there is not enough business to win.

3. There is no room reserved for new companies. Even new companies have to fight with new companies. Business world is actually saturated, on any given day. Old business in a new day is a new business.

4. The big companies fight with big companies, and the small companies fight with small companies. Everyone has a fight on their hand to win money, which is cash flow originating from the customer demand.

Would starting a restaurant be easy? Let's hear the story of Panda Express.

Panda Express is a subsidiary of the Panda Restaurant Group, Inc. The Panda Restaurant Group was founded in 1973 by Andrew Cherng and his father, Ming-Tsai Cherng. Their first restaurant chain they opened up is Panda Inn, in Pasadena, California. This was more formal, sit-down dining, contrasting the fast food nature of Panda Express. At the beginning, business was lacking to the degree that Andrew had to offer special deals and freebies so that customers would dine at Panda Inn.

In 1982, Peggy Cherng, Andrew's wife, joined her husband in the restaurant business. In 1983, through their connections with then-UCLA football coach Terry Donahue and his brother Dan, the manager of Glendale Galleria invited them to make a fast food version of Panda Inn for the mall.

According to public information, Peggy Cherng customizes the restaurant's operating systems to assure the very best food and service. She has a PhD degree in Electrical Engineering and worked as engineer in McDonnell Douglas. Because Peggy had worked for several years as a software designer and engineer for defense contractors, Panda Express computerized its operations early on. This has to be an unfair advantage for fellow Chinese restaurant operators. Peggy also brought a systems analysis perspective to the business and worked through the logistics and standardization issues necessary to scale up the concept.

This is how she made the journey from a math major to a self-made business woman.

She came to the United States to attend Baker University in Baldwin City, Kansas, where as a freshman she met her husband to be, Andrew Cherng, then a sophomore. She transferred a year later to Oregon State University, where she earned a bachelor's degree in applied mathematics in 1970. She then attended the University of Missouri, earning a master's in computer science in 1971, and a PhD in electrical engineering in 1974. She worked towards her PhD by developing a pattern-recognition program that digitized X-rays and applied algorithms to diagnose congenital heart disease. After earning her PhD, she and Andrew moved to Los Angeles where they married.

From 1975-1977, Cherng was an engineering specialist at McDonnell Douglas, where she coded battlefield simulators for the US Air Force. From 1977-1982, she was a technical engineer and software department manager at Comtal Corporation, a subsidiary of 3M.

In 1982, she built the restaurant company's computer systems to track customer feedback and streamline operations. She used computers to track inventory and re-order ingredients. As the quick-serve concept exploded, she became a one-woman IT department, developing point-of-sale terminals and pattern-recognition software to track inventory, purchasing, and shifts in customer behavior. Peggy’s technical prowess gave Panda Express an edge, as it provided the upstart company with perhaps better qualitative feedback than even the fast-food giants had at their disposal. “The kitchen area is low tech,” Peggy says, “but the management system can be high tech—how to catch the data, how to analyze data to see what’s most salable, what’s not selling, and to determine what to offer and what not to offer.”

Within a decade the potent combination of Andrew’s ambition and Peggy’s data-crunching skills was responsible for more than 100 restaurants. Peggy’s programs also enabled the company to procure with as little spoilage as possible the fresh ingredients it needed to offer a menu vastly more complex than other quick-serve places offered. “Andrew’s vision is that he doesn’t see anything that’s not possible,” Peggy says. “But visionaries need a system and structure to provide the growth.”

You see, being number one in fast Chinese food in the USA has a lot of rewards and challenges.

If you think business is common, then you might rethink now. In 2017, the founders gave Caltech 30 million dollars of donation to support advanced medical imaging research. Now that does not happen everyday.

I tell this story to let you know the importance of fighting, persistence, and analysis in business.

In business, the winner takes all, big or small, good or bad.

In business, the winner of anything gets to live a good life.

Topics:

Cash flow. No new opportunity. Supply chain and demand. Fight. Panda Express. No guess and no chance. No chance upon.

Brutal Truth: Business is designed after start

In an episode of the Garrison's Gorilla's, the team planned to destroy an enemy bridge. Lieutenant Garrison planned with his men. They got to the site. Most things go without a hitch, but some key elements don't work. They had to improvise, and almost lost lives. Eventually they succeed after many twist and turns.

The same thing happens in business and starting business.

At Google's start, the founders did not know how to make search a business.

When MIT professor Rodney Brooks started iRobot, his plan was to build military robots. The company's bread-and-butter business later becomes Roomba, a vacuum robot. No one knew ahead of time that this will catch on big.

When Microsoft started, Gates did not really know what he was going to make. Their first product is just a compiler. Later it becomes a maker of operating systems.

The Wright Brothers were operating a bicycle shop, and accidentally discovered how to make air planes fly.

Business design really starts after you start. In other words, planning still continue after you start.

One must plan. However, no amount of thinking and planning is enough. You must start. Take the plunge with the best foot forward.

Business can not be designed before hand. It can only be found after you have taken the risk. Why?

I can cite three fundamental reasons.

1. A working system involves many moving pieces.

2. Nothing about the moving pieces can be known before you start.

3. If an arm chair general can know, then everyone knows. Then it is a bad idea due to too much competition.

Start with what you have today.

So you can have experience.

Experience help you write a plan. But more important is this.

Experience help you deal with unplanned.

There is no security. There is only opportunity.

Many people are worse. They think but don't plan. The confuse thinking as plan. They want careful thinking instead of carefully planning for combat and match.

No plan is safe by clever thinking. Nothing is save by doing something small.

Everything has competition. There is nothing to chance upon.

If you can think clearly before you start, it is too easy.

Realizing anything involves tremendous amount of details and work. I will keep repeating these three points about entrepreneurship.

To realize dream, you must go through business.

World is full. Everything is interrelated.

Selling something costs more than making.

To do business, you must get investor. Investors need people who can make plan but also improvise.

Investors know this.

You count on idea before start. But count on serendipity after you start.

Founding company is really the start of the opportunity discovery process.

Brutal Truth: A buyers' market everywhere

Many people think the world needs more solutions and needs change. This is a typical seller's market mentality.

The world is a buyer's market when it comes to new products and solutions.

What is a buyer's market for the seller?

•Buyer can wait

•Buyer can bargain

•There are too many sellers. The cost of selling is very high

There are six related meanings here.

1. People buy what they demand. They don't buy the solutions you offer, even if you are helping them.

2. People decide what to buy, when to buy, based on their problem they face. They may choose to buy nothing other than the essentials. Everything else is discretionary spending.

3. The best the offer providers can do is to ask potential buyers to review. People won't scramble to seek and buy your solutions.

4. The world is saturated with useful products and good merchandise items. The cost to make others aware of your offer is very high.

5. What sells well are things that market well. What sells well are what people think they want.

6. Anything you sell is likely not to command a suitable high price that gives you profit.

Everything is needed, but also nothing is needed.

The buyers will decide to go and find when they need something.

Here are some examples.

If one designs a cancer early detection system that can drastically find cancer biomarkers earlier, will people rush to buy it? No. That company has folded.

If one designs a portable hand held device that detect indoor air pollutant that can cause cancer and death, would people rush to buy it? No. That device has been discontinued.

The cost of selling something is very high. Actually more expensive than making them.

Brutal truth: Business is about meeting demand today

To realize entrepreneur ideas of change, you must enter business.

To do business, you must find what customers demand.

Never let customers find what you have to offer. They won't.

Find what customers want today and start today.

The customers may not be smart, but they are the one with cash to spend.

Business does not care about tomorrow. Tomorrow will be another day.

The customers do not buy what they need. They do not buy what they want. They spend to get what they demand. What they demand sometimes makes no sense, but all the business organize themselves in a supply chain to feed that demand. They consume. That is the consumer's job to spend. Cater to them.

Business does not have to make sense.

In a supply chain, goods move from factory to wholesaler and then to retailer. Each one plays the role of distributor. Each party gets a share of the price the customers pay. The price changes, from very low at the source to the retail price at the end.

You are a good engineer? you want to do good things? the world does not care. They can not relate to you.

You must relate the customer's whim and wishes.

Brutal truth – any business must last a life time

Business is a relation, a relation of benefit exchange.

You give customer the products.

Customers give you some cash.

From a customer's perspective, they decide to keep your offer, and leave you with some cash.

A relation must be lasting and real.

If a relation does not last, it is not real.

Put it another way. If a relation is not real, it will not last.

Every business must therefore last your life time. Or you must be prepared for it.

Business takes 10 years to start, and a life to maintain.

Very few people can do multiple business and companies like Elon Musk. Never use him as an example or a role model.

Elon Musk simply has the credibility because he is real. He acts real, hence people can believe in him.

You may not like him, but he has not openly lied to gain anyone's favor. That is his brand.

Most businessmen do not have a brand.

What are the consequences?

1. If you start something small and happen to succeed, then you are stuck with the minor success for life.

2. If you keep changing ideas, then none of the ideas would work. Not a single one of them.

3. No one can drop in and bail out at will. If you start some business, you must take care of it.

4. Be careful with little cute ideas. It may end up consuming your life.

Why so many founders divorce

Face it, entrepreneurship is not kind on family. Donald Trump seems to have a tense marriage. The world's top riches like Gates, Bezos even divorced at older age. Some like Musk and Oracle founder never married.

Entrepreneurship is hard on married life due to four reasons:

1. Entrepreneurs life is highly irregular. Entrepreneurs do not have comfort zone thinking.

2. Entrepreneurs are either rich or poor. Business is about greed and fear. Some are in fear, and some are greedy. It can creates a lot of conflicts.

3. Entrepreneurs learning and philosophy are different. Your spouse most likely don't know what you are and what you must go through. it is source of many conflicts.

4. Your work may well lose a lot of money for the family, no wonder people don't like you.

The founder of McDonald's restaurant is a case in point. He divorced twice and met his third wife was a fellow in the restaurant business.

Not all startup founders are divorce. However, for young engineers it is important to know the consequence. The pressure on a family is immense.

Your learning and success has a hidden cost.

Career and work

L67 Regular job and entrepreneurship

In this lecture we talk about regular job vs. entrepreneurship choices. Here is the outline.

•You can have a job, but you do not know how to create one.

•People make money together, not solo.

•Becoming entrepreneur is to embrace uncertainty, and live three lives in one.

In 2023, it is important to talk about job. Regular job or entrepreneurship? Even if you have a good job, it is perhaps not secure. It is important to have some options. Even if you like it now, you may eventually be pissed off by someone.

March 2023, the famous streets of Paris are lined with garbage bags. The city smells. Why? French workers strike against the government for proposal to increase the retirement age from 60 to 62. Obviously the government wants to save some money. But one take away is this. People really don't like to work. Not on a job at least.

Some people who don't like jobs wants to try entrepreneurship. This would not end well. Let's talk about this.

In a regular job you work for others dreams. In entrepreneurship you work on your dream, but the cost is all yours.

Entrepreneurship is to create a company. It is not a regular job, much like saying Michael Jordan is not just a athletic person. An entrepreneur create jobs. But first you must create a job for yourself.

Entrepreneurship is not a job. It is work.

Entrepreneurship is not about risk. It is about uncertainty. It is about ups and downs. It is about competition.

Most people are not familiar with business, not familiar with management, and even more unfamiliar with starting a business and managing your own business.

Some leave their regular 9-5 job to start a business, because they want to live like their boss. That is wrong. Entrepreneurship is not a solution if you can not handle a regular job.

Your regular job was someone else's entrepreneurship result. It was not easy for other entrepreneurs to have created that job post for you.

Such engineer entrepreneurs will be in for great learning, and a lot of loss. They don't know how to make product, how to build business, how to make a store, and how to manage their own business.

This is why people say entrepreneurship is like learning to assemble a parachute after you jump.

Most people make the uninformed jump from job to entrepreneurship. They think:

1. I can do it solo.

2. I can make money for myself by myself.

3. People will pay me the same as I am with regular job.

All these are wrong.

They have vague idea of entrepreneurship and they have some motivations:

1. They don't like current job;

2. They want to have more money;

3. They want to be boss;

4. They want to be free. They want to have a life style.

Unfortunately, entrepreneurship is not the answer to these dreams. Not without hard work.

Allow me to explain.

Whatever you choose to do or want to be, it is a conscious decision of destiny.

Let's talk about all the possibilities for your career planning. Do you want one of these?

1. Do you want to be the owner of a business?

2. Do you want to be a CEO of a company?

3. Do you want to be a manager?

4. Do you want to be engineer all career with no promotion to management roles? maybe you don't want the hassle.

5. Do you want to work in the business unit or engineering unit of a company?

There are several ways one can categorize these career options and life destiny.

1. Do you want to be owner or operator?

2. Do you want to be in the comfort zone?

3. Do you want to be doing business or play support roles?

4. Do you want to be manager?

5. Do you want to try start a business?

Each is actually a conscious option for engineers. But most life is short so you must pick one.

Do you think people like Elon Musk and Donald Trump interesting. Their job is to build business. More than business. More than manager. More than boss. More than engineering. They are everything in one.

The difference between a regular company employee and a startup entrepreneur, is like a person who has seen the rain vs a person who carved a new river.

Business world is all uncomfortable and uncertain, no matter how much you make. But starting a new business is orders or magnitude more learning and more torture. But you do get enlightened. It is the only way to learn the Tao of life.

Enlightenment is not free, and is only attained after you go on an extraordinary journey that few take.

Startup is one of such journey. You thought it is a road side short trail for an exercise, it turns to be the entrance of a no return journey for whole life.

People who take on this journey include names like Donald Trump, Elon Musk, Jeff Bezos, and Bill Gates. Whether you like them or not, you can agree they all have uncomfortable life - for one thing, these men have been through divorce. If money can bring happiness, these richest people certainly won't agree.

Most people live one life. They go to school, work for industry, retire to sunset. They are engineers for life, never management, never business building, never rich, and never owner.

The entrepreneurs live three lives in one.

First they become businessman when they are young.

Secondly they build a business from nothing, and they created their own job and income.

Thirdly they grow their company to stable survival and size, so the culture will pass on. In other words, they returned to the comfort zone.

Along the way, they see human beings at their worst. They endured competition, stealing, sabotage of all kinds. They make decisions on the fly, innovate, and used their creativity to the fullest.

The entire world may still see them as common - but that is because no one knows what they must go through just to survive to the day.

For young people with a college degree, think of entrepreneurship as a PhD degree that you do on your own. You learn more than at school.

A startup when young is a great way to get yourself a job.

There is nothing regular about being entrepreneur. You work 24/7, 365. You lose money everyday to pay someone, but no one pays you enough.

This is even when you succeed. A potential entrepreneur should think about how to upgrade a career without taking the entrepreneur route. We will talk about this here next.

L68 Comfort zone and T shaped knowledge

In this section we talk about two important concepts.

•The comfort zone and business zone

•Knowledge and knowhow.

Let's first talk about the comfort zone.

Before you start anything, it is very important you know what the concept of comfort zone is.

Business is never comfortable. Even large companies like Amazon and Facebook lay off 10000 people at a time when the COVID lock down ended.

Business is up and down all the time. Business can make a lot of money, but it is never secure, both for employees and the owners.

Society is divided into two zones: the comfort zone and the uncertain zone.

People in the comfort zone works for the government. Their income is guaranteed by the tax income. Think of them as living in a town.

In the comfort zone, people have flexible hours, they take weekends off, and they have vacations. They don't worry about their job gone or being laid off.

Comfort zone is sometimes called the establishment.

The government business does not have ups and downs. It only goes up. They are secure and they can have more life than work. Their job is guaranteed by line item budgets. The jobs are called positions. You hold a position.

People in the business zone works for private enterprise. Their income is not guaranteed. Think of them as living in the forest outside of the town. In good years, they pay taxes. In bad years, they pay taxes.

When business people talk about work life balance, it is clearly indicating that leisure of life can interfere with business survival.

When you finally pick entrepreneurship, really entrepreneurship picked you. It is a life long choice. Whether you know it consciously or not, you moved yourself outside of the town.

Schools are unique. There are several reasons.

1. Most professors lead life in the comfort zone. They know nothing about uncertainty in business.

2. Most graduates of schools become employees for the business. Most do not become entrepreneurs because they are not prepared. They learned neither business nor management. Remember, their professors don't know business.

Business itself is a school. Whereas formal education teaches general knowledge printed in books. business teaches deep knowledge that you can only learn by experience.

The knowledge and knowhow is different.

1. Knowledge is printed; knowhow is never printed.

2. Ideas can not be protected; knowhow is how business people prevent others from copying them.

3. The cost of knowledge is whatever they charge for the book. Knowhow costs millions of dollars and decades to develop.

Be careful with the degree. In schools one gets educated. In entrepreneurship one learns. In business you learn the things not printed in formal education books.

Don't believe it? Let's look at one argument.

There is a long list of individuals who become great business builder without going to college, even if they could have. They include

1. Thomas Edison

2. George Westinghouse

3. Wright brothers

4. The founders of Microsoft and Apple all dropped out of college.

These people all bypassed school. They are knowledgable, but they did not learn at school. They even did not go to formal education in schools and still picked up general knowledge by reading.

Business can be glorious, but business never teaches. Business teaches only when you are doing it.

Schools and formal education is a concept of the comfort zone. In business, one learns on their own, on things no schools ever teach.

Whether you are entrepreneur on your own or work for the industry, you belong to the uncertain zone. Business is wilderness survivor.

Business is chess match against your opponents. It is attack and defense.

Any small business is severe competition, because any small business can make a lot of money.

If a fort is not occupied, don't take it.

If an idea has never been done, don't do it.

Even if you have made it rich in the business world, it is still not comfortable. In 2023, the Silicon Valley Bank collapsed. Several years in the row, the business of the bank was booming and setting historical record. Then it suddenly collapsed.

Why business is not certain?

1. Business climate can change overnight;

2. There could be new disruptive technology;

3. There could be new competitors.

4. Your technology will get old one day.

Real learning is not comfortable. Real learning is done by making many mistakes.

Owner, manager, CEO, leader, founders

Career needs to be planned. Or you will be too late. It is better to plan ahead, before it runs out of steam.

One day you will over qualify for every job and become unemployed. Individuals must also grow and pivot.

Before you say "I want to be my own boss", let us explore the meaning of five titles.

1. Owner.

2. Manager, CEO

3. Boss

4. Leader

5. Entrepreneur founder.

Jobs and work in the comfort zone and business zone are drastically different.

A comfort zone job include:

1. College professors, public school teachers, librarians in local township;

2. Government employees of all kinds;

3. People whose life is mainly supported by tax dollar directly or indirectly.

Government business is actually great business. **Government is monopoly with recursive income called tax.**

Here let us discuss only private enterprise business.

There are four distinct points when you want to make a career plan in the private sector.

1. Are you the owner or not?

2. Are you in business units or part of "indirect cost"?

3. Are you managers or not?

4. Are you starting a business or working in an existing one?

There are several ways to catalog choices.

The owners of business get profit sharing and a lot of equity and stocks. They are ultimately responsible for the company but they don't put in hours everyday. There was a time when they worked hard like crazy.

The CEO of a company is actually the owner's employee. Any manager from CEO to group lead is an employee. Managers do have power, along with more responsibilities and work.

There are many layers of managers. Each one can be called a boss for the subordinates. Some people don't want to be managers. If you do want a manager job, it takes many years to become one.

In a company there are business units and support units. Business units deal with marketing, sales, and strategy. People in the business units are equivalent to soldiers on the front line.

The support units or divisions deal with maintenance, research, engineering, accounting, and quality assurance.

A leader is a valuable player who produces a business victory. He can have any title. He leads the company to a victory ending.

A founder is everything in one. A founder is an owner, a CEO, an employee, and a leader. Failing at any one of these will result in a loss of all these lofty titles. Don't take your title too seriously. There is no entitlement. Everything is earned.

Founder, CEO, MBA

Let's talk about the difference of founder, MBA, and CEO. These are closely related and often confused.

Any company's operation has at least two parts. The business part and the management part. A CEO handles both the business and management. Some positions focus on management of projects such as engineering and sales. Some positions focus on business such as marketing.

To be a great businessman well, one must have both formal knowledge and street savvy. Founders can not be taught in school.

In MBA schools students learn some formal knowledge about management and business. But such knowledge are not rooted in practice. MBA graduates may become manager material, but not business builders.

Founders ideally should be able to handle both business and management. Great founders like Steve Jobs are not MBA graduates and never go to graduate school.

Business and company needs management, but management is not business.

Business building is not normal business operation. Most managers and businessmen can not build new business.

If business is war, then the people who are actually conducting the business are the soldiers on the front line,

Everyone else is in support roles. In war, the support role players include military school graduate and military officers. In business, the supporting roles are accounting and engineers.

Some one who is great engineer does not make a good founder. A CEO and MBA do not make founders automatically.

In the military and in business, there are some parallels.

1. The entrepreneur is like a front line soldier fighting in the trench.

2. The CEO, president or other managers may be just a officer sitting in the office. They may just play the support role.

3. An MBA student is like someone from the officers' school. They may be officer, but they still have not killed enemies yet.

Appendix: Lexicon and glossary in plain language

Why humbleness matter

Why silicon valley investors want founders who have scars and who is humble? Why not just invest based on IQ and education?

Because a leader must be humble. Humbleness is a sign of deep self learning.

Good business people are humble.

What does that mean?

1. They do not think smartness is key contributor of success.

2. They know all success is result of hard work over long time.

3. They know success is result of many people working together.

4. They know that chance eventually plays a big role in their success.

Why investors only invest in humble people?

1. They are confident and can handle surprises in business;

2. They achieved humbleness through experience. That experience is very expensive.

3. Humble people won't make small decisions such as proving himself smart.

4. Humble people are appreciative of others. They are not boxed in.

Great business builders are both confident and humble.

They are not just humble.

They are not just confident and vein.

An engineer can be smart, but a top leader must be both smart and humble. If not, the leader will lose the war.

A leader who is not humble is not experienced. Hence he will lose.

A leader who is not humble will not listen. Hence he will lose.

A leader who is not humble is not open minded. Hence he will lose because he only listens to himself.

A leader who is not humble will over look big problems. Half of solving a problem is knowing it exists.

Steve Jobs says. Stay foolish.

It means stay humble. It means knowing and admitting that you are foolish.

Humble people never bother about smartness.

1. They know they are smart. They also know others are equally smart.

2. They want to work with people and team.

3. They know luck is created by persistence.

4. They know the importance of money and capital.

Everyone is smart. There are plenty of these. Only the good ones are humble.

Humble people are mature and confident. They know they can fail. They are doers and they learned by costly mistakes.

Ironically, no way to teach humbleness. A smart person refuses to be humble by nature.

An army led by a smart leader will die. History is full of examples of that.

Why so many culture put a lot of weight on humbleness? to be humble, a smart person must do and fail. Such person is experienced and has vision. You want these to be leaders. Not the one who has not even failed.

Humble leaders see the turns before they happen.

Humble leaders acknowledge problems when they happen.

It is simply too expensive to teach a smart person to be humble.

How to tell if someone is humble?

1. They admit they are wrong;

2. They are open minded about your ideas;

3. They don't blame others for all their mistakes;

4. Humble people are not afraid. They admit problem honestly and provide sound solutions.

Humble people have scars.

Distribution, traction, and snowballing

After start, the founders work is far from done.

We all focus on zero to one. But people ignore one thing.

Every zero after the one is ten times more work. It becomes increasingly harder as you have success.

Business is building the flow. Traction is how you go to people and how people find you.

People think business is easy and common. It is an illusion.

We talk about three concepts.

1. Traction finding;

2. Traction building;

3. Snowballing.

At first, you must find the traction. Here traction means customers activities and demand. You don't know how to make relation and money, but you know customers are bumping into you. Maybe customers are searching for something.

Traction means you found the main stream demand. In the old days business list themselves in the yellow book pages. Each company can list itself in one spot. Traction means you know where to list yourself. When you list, you know people's fingers would be going through the pages.

Follow the track to find where customers are doing.

"Finding traction" means you will have organic demand trying to look for you. Traction means you are in demand. It is just a matter of speed. Not a matter of "yes" or "no", but rather "how much".

If you offer a fantastic solution to a problem, but no one is looking for that solution, your company will have no business. You will forever be a solution looking for a problem.

You see companies, people, stores sell things fast. But they are hard to repeat.

They have build the tracks.

1. The track for customers to find them;

2. The track for goods to move frictionlessly.

Once the track is built, you get more and more efficient. Your profit and reputation slowly grows.

In summary. Track means four things. A good business has its own track to run their business.

•Traffic of people

•Flow and movement of goods

•Pathway for distribution of your goods

•Passage where people can find you.

After a business is on the map, its traffic will snowball over time.

The traction is part of the business asset. People monopolize the track. They don't share the road, because they built them.

Appendix: case studies

Women engineer starting great non-IPO business

If you want a great example of someone from engineering background moving into startup and eventually becoming a self made billionaire, you want to study the story of Judith Faulkner.

If you want to see how someone manage to steer the growth of a company over 20 years, you can study the company she founded - EPIC systems.

Faulkner has become one of the world’s richest women; Forbes estimates she is worth $2.4 billion. But despite her wealth and the massive influence her company has on Dane County, Faulkner keeps a low profile.

Growing up in New Jersey in the 1960s, Faulkner was a nerd before Microsoft founder Bill Gates made them cool.

Faulkner's life is informed by the parents who raised her.

Faulkner came to the University of Wisconsin-Madison in 1965 to pursue a master's degree in computer sciences after graduating with a bachelor's degree in mathematics from Dickinson College in Carlisle, Pennsylvania.

UW-Madison's computer sciences program was only the second in the country at the time. Its curriculum wasn't finalized, professors weren't sure in which school it fit and women researchers were few. An early class Faulkner took at UW-Madison introduced her to the potential in pairing computer science and medicine.

Faulkner actually started her Madison journey in the psychiatry department. She already had an undergraduate degree in math from Dickinson College in Pennsylvania, and was completing her master's in computer science in Madison in 1976.

At school, Faulkner took a lot of initiative. She did have a lot to say and a lot to discuss, a lot of questions to ask. However, she did not pursue a PhD program.

A professor recommended her to faculty members who wanted to develop a program that centralizes and tracks patient information. Two of Faulkner's early mentors were Dr. Warner Slack and Dr. John Greist, both advocates for applying computing devices to logistical health care problems. Faulkner did research with both men that ultimately led her to create Epic's initial software. In fact, Warmer Slack has started to make computer and patient interact since 1966.

In 1965 Slack had the idea (called 'patient power') that we could program a computer to interact directly with patients to engage in a meaningful dialogue to explore medical problems in detail and do so in a personalized and considerate manner. It was quite controversial at its time. Slack said Faulkner was an "outstanding student and had wonderful ideas."

Greist met Faulkner in 1969 when he was the chief resident in internal medicine at UW. Together, they would become the primary co-founders of Human Services Computing, later to be renamed Epic.

Greist, who worked in the psychiatry department, needed a graduate student to make a call schedule for the hospital using a computer, and called on Faulkner. She stayed up all night several nights in a week to finish it, Greist said. These later become the foundation of EPIC.

Faulkner wrote the code, using the computer language MUMPS, (Massachusetts General Hospital Utility Multi-Programming System. The founder of Meditech, an electronic health record company, had developed it in 1968 at Mass General Hospital. Faulkner's program became the kernel of the Epic electronic health record. In an era pushing for openness, Epic has accomplished this in a decidedly old-fashioned way. Its electronic health record is based on a 44-year-old programming language called MUMPS.

By 2000, Epic had 69 customers, and had yet to figure in a top 20 list of EHR vendors for hospitals. Its hospital customers were negligible, but two had quietly garnered awards, notably the northwest branch of Kaiser Permanente in Portland, Ore. So, when the Oakland, Calif.-based HMO, began a search in 2003 to replace its old IBM system, Epic found itself on a short list that quickly became a face-off between Epic and Cerner. The Kansas City-based company had over $500 million in revenues in 2003, more than three times Epic's. It was also founded in 1979. Kaiser decided they like EPIC, but wanted Faulkner to sell the company. However, Faulkner refused. Over 20 years later, Cerner was sold to Oracle, while EPIC still remains in Wisconsin, still remains true to customers, and still remain Faulkner's.

I hope you find this story interesting.

It shows:

1. Many smart people can get into the right position to hit on something by serendipity; Many even at the same time, some even before you.

2. Some of the startups succeed on hard work and eventually good luck;

3. Customer service and connections are important;

4. Business strategy plays a key role among a field of competitors.

L85 Luck and opportunity

When taking a risk, everyone wants better odds and everyone wish to be lucky. People ask questions like these:

How many times do I need to fail before succeeding?

If I have failed three times should I continue?

How many different failure risks are there?

Let's talk about this.

First, let's review.

In lecture 2, we discussed that entrepreneurship is inherently risky. We discussed that risk taking is an advantage if you are not heavily capitalized.

In lecture 21, we discussed about taking chance and risk.

1. A risk taker knows the odds against him, but he still does it because he has skills to adjust. Or they can survive the worst.
2. A chance taker assumes the odds are good and no bad things could happen.
3. A risk taker is willing to take the worst-case result and consequence.
4. A chance taker assumes only the luck is on his side.
5. A risk taker is doing it for a second time.
6. A chance taker is taking a first time ride.
7. A chance is when you don't know your risk. Therefore, great entrepreneurs are never first time entrepreneurs.
8. A chance is where you believe things may turn in your favor, by mystery or "I believe".
9. A risk is where you know things may sour. You know because it has happened before to you.

Great entrepreneurs are not doing this as their first rodeo. No one wins a trophy on their first rodeo, let alone a luxury yacht.

Great entrepreneurs know that the risks are buried deep. It is a booby-trapped mine when you enter any industry and market. Only newbies believe they are reason based on logic

Luck is of course necessary to success. In fact, it is said there are 1000 ways for a startup to fail. You only know the risks when the startup has survived. The "successful ones" are merely the ones that survived all the accidents.

Here is a famous diagram of the survivorship bias. People analyze war planes that made it safely back to base, and found many of them have been shot at many times. They only survived because they are lucky, not because they were never shot at.

Every great entrepreneur is like this. They are not super smart. They tried super hard and they were not shot down. They have capitals to restart, and they started early.

Luck will never happen when you take a chance, once. The odds for luck to happen is too small.

There is a saying like this, "all successful companies are the same, and all failures are different".

It is certainly alright to reverse it. You can say "all successful companies are the same, and all failures are the same".

In fact, no successful startups are the same, and no failed startups are the same.

Generally, the number one way for entrepreneurs to fail is to be impatient. If you expect great results and making money in 2 years, you are drastically underestimating the time needed to learn and build.

The number two way for entrepreneurs to fail is to lack funds. In startup, money does solve many first timer problems. You see, it is like any computer games you play. You need gold coins to continue sometimes.

However, great entrepreneurs know the odds of success and they merely started young.

Great entrepreneurs start early in life. Their first risk does not cause permanent harm. Bad entrepreneurs wait and start late, and lose the livelihood on a chance and gut feeling.

Thomas Edison started young. He did not attend elementary school. He started tinkering and selling at that age. Elon Musk started young. He built and sold first computer game at age 15. Bill Gates started young. He built a traffic monitoring network in high school and tried to sell it. Steve Jobs started young. He and his partner made the blue box for hacking long distance calls in high school.

Many people are familiar with Edison's quotes about success. But not many know his quotes about failure. Edison said this about failure. "I have not failed. I have just found 10000 ways that it won't work". He said this too. "To invent you need good imagination and a good pile of junk". He then said this. "Many of life's failures are people who do not know how close they were to success before they gave up".

You may wonder why no one told me about these good quotes. Well, media and books like to spread good and popular news, not cautions and warnings. It is always the case through history.

Opportunity is a special kind of luck.

Opportunity is a luck you recognized instantly, because you have tried hard enough.

Great entrepreneurs use opportunities. They don’t just try to make changes.

Opportunity is a special kind of lucky. It is associated with timing. Thomas Edison was born in the right age. Bill Gates met the micro-computer age. Steve Jobs met the micro-computer age. The opportunities are rich for a time. Now you know why Gates, Jobs and Wozniak all immediately drop out of college. Because they know opportunities have finite shelf life.

Appendix: Analogies for business and entrepreneurship

Analogy business is river money is water

Many super rich do not seem to live a luxury life. Case in point, Elon Musk. He does not even buy expensive houses with his money. People like Gates and Buffet want to give away their money by donation. Why don't rich people care about money?

Here is an outline of this lecture.

•Business is not about money.

•Startup is to make a river from scratch.

•Startup skills can only be learned in startup, then you can startup anything anytime.

Money is water. Business is river.

Business is about setting up the flowing of money, transporting benefits from the source to the end consumers.

Startup founders carve new rivers.

It takes money, time, experience to make the river.

Once you live next to a river, you can have water any time.

Until someone makes a new river that divert your water.

The operators cares about the flow of water, but the investors want to help you build the river and sell the river to others. They want many years worth of water in one shot. Investors are even richer than rich owners. They don't even care about getting water from the new river. They just care about the river itself.

The river is a supply chain of companies, serving the demand of a group of end consumers.

When you make a river, you make it possible for many people to make money together.

Rich people are business builders. They figured out how to build rivers, hence they never worry about water.

For rich people, their business building mindset is their real asset. Once you know where rivers come from, you will never worry about water. Once you can pick and build business, you never worry about money.

Once you have a river, money will come to you.

Analogy: Free style LEGO building

We discussed early about the fit of market, product, and customers. There are many markets, many products, and many classes of customers. Any fit can make a merchant or businessman rich.

A good analogy is like a Lego building master building a free style Lego. There are so many different varieties, each one variation represent one idea or one business.

For example, you can be in the watch making business. There are expensive watches for high end customers, and super low cost watches for gifting. There are watches for men, women, athletes, runners, swimmers, and flyers. If you can dominate one of the combinations, you would have already become a big business.

How do you build a Lego that can make money? how do you prevent others from building the same Lego piece after you have built it? How do you build and sell a Lego piece?

Therefore, never care about ideas. Each idea is simply one possible combination of a Lego building. You must learn to beat the others, not just be the mastermind. You have to be the master builder and master seller.

This being said, you should never try to come up with an idea that no one has thought of. Every idea has been thought of. You just need to pick one unique combination. If there is a good looking watch for rich people, then you can make a good looking watch for low budget. That combination is unique, even the idea of watch making is not unique.

There are so many possible ideas. Never be happy with just one.

A random combination may not become a business. It is just an odd hobby.

There are so many combination of ideas, you need to focus on only one.

Appendix: Extra extended thoughts

Investor's Secret Check List on You

Investors are mysterious to founders especially first time. It is as mysterious as your date is to you. The investors check you out, and here are at least six things they never tell you they are checking:

1. Are you a first time entrepreneur?

2. Do you have a co founder and has the co founder given up job?

3. Is your idea also being talked by other teams?

4. Have you got rapidly growing sales record?

5. How big is the business you are trying to build?

6. Are you building a business or a memory?

Let's talk about these.

If you are a first time entrepreneur, no investors will fund you. Even if you are the father of a field and distinguished professor, you won't get funding.

Business is learning on the job. Investors don't want to be the sucker paying for your tuition.

If you have no cofounder, that is the end of discussion. The investor is not the cofounder and they will not match you with one. If your partner is keeping his job, then he is not a cofounder. He is just a support.

Investors don't care about keeping your secret ideas. They smell a rat if it is a top secret that you can not even share with them. The secret is how to realize the idea, not the idea itself. The investors won't fund things no one else is doing. It is a telltale sign you are barking under the wrong tree.

Don't ask for money to build a product. Use your own money to build the product, make the sales, and show the investor the sales record. If the sale is weak, there is no investment. If the sale is strong but not growing, there is no investment. If the sales is growing slowly, then there is no investment.

If you are trying to build a small business, count the investors out. Use your own money. Investors only want to build big ones that takes large amounts of money.

Many entrepreneurs are doing this out of boredom. Investors don't like to fund such folks. They won't fund anyone who is trying to make a memory, a hobby, or a cool gadget.

On the flip side, forget about the sing and dance. Forget about talking. Investors want to know what you have done with your ideas.

Never focus on things on this fake list. These are nice to have, but not sufficient.

•The power point and stack

•The elevator pitch

•The minimal viable product

•The great idea, the patent, the problem, the invention

•The startup competition, the innovation brain storm.

If the investor thinks you might have a shot, they will start to think the following:

1. How much money you really need? never tell them you need only small change.

2. Do they have the kind of money that you need to success? If your valuation is too high, they will get very small shares for their investment. In that case, they are out.

When it comes to putting their money to use, investors have many options. You are just one of them.

Infinite details at the bottom

Business is a way of life. The extremely professional way where you form relations and provide benefits.

To realize your dream, you must go through business. The world is fascinated with the future and advanced technology, but no one will pay for the development. You must prove your innovation by benefits you can provide.

Anything in life has the bright and dark side. Schools teach the bright side. You must learn the dark side yourself.

The dark is the deep.

To realize a fantastic idea, you must go through the deep dark space.

Whether you are a dreamer, a techno geek, an innovator, or just want to get rich. You must go through this dark space.

Not by yourself, but all the learning is on you. This is called leadership.

Here are somethings we teach at school. And here are some realities.

1. At school, we teach technology and solving problems. In reality, there is a competition to solving problems.

2. At school, we teaching about satisfying the needs. In reality, finding what customer demand is more important. They don't demand a solution. They demand a benefit.

3. At school we use books. In business, anything valuable is not written down. You only learn by making mistakes.

4. Business is both about the fear for survival and the greed to grow.

Entrepreneurship is many things in one.

1. You make a product;

2. You sell the product;

3. You build a company to make and sell the products;

4. You grow the company.

Entrepreneurship consists of multiple series of these things in multiple stages.

1. You must live three life.

2. You must fail and analyze your own failure. You see, every startup you make is like a chess game you practiced.

3. You must build a product. Then you must sell it. Then you must grow the sale.

4. You must start to sell something, then you will find what people really want to buy. Then you make that.

Serendipity beats thinking.

There is infinite amount of money. There is infinite details at every niche. It is like every simple chess move can involve millions of consequences.

Heard of Tom Cruise's movie Mission Impossible? there is an exciting motor cycle jumping scene. To make that scene, the movie crew decides to do a real jump instead of using computer graphics. This is way more difficult. Then it is important to position cameras at the right spot to catch the sequence of jumping. To do that, the movie crew used software to calculate trajectory based on difficult conditions. It is starting to get complicated.

You see, real business people pick the hard way. Why? only when you do things the hard way can you build worthy knowhow. Real entrepreneurs embraces the details. It separates them from the amateurs.

There are infinite details at the bottom. Everything is new, for everyone. Everything needs to be figured out, learned, and understood. This is what your smarts will be for.

The sooner you become a master of your niche, the earlier you become free.

Free to pursue your dreams.

People are not kind and they don't care. You must find what they care, and give them more than they need. Then you have business. Then you are rich.

Business is not common, and it does not teach.

Business can get rich, but you must fight everyday to pay for the cost.

No matter how good and smart you are, you must compete at the bottom, to come up on top.

Whoever gets deeper than the next person will win.

Business is a match like chess, and a competition like basketball. The more you play, the better chance you get of enjoying it.

Reserve

Section 15, Appendix – Case Studies

Business building is generational accomplishment, even for Jobs, Gates, Bezos

Elon Musk have good ideas for four reasons.

1. He started to become business person at age 15. His ideas are business ideas, not dreams.

2. He has well grounded business ideas with large room to grow. As result, he was financially compensated well for later growth.

3. He financially funded many companies. Many ideas later become attached to him.

4. He works with great people and fantastic cofounders. Their ideas compound.

How Steve Jobs and Bill Gates stole ideas and realized them

Every business people stole ideas.

TEMU vs. Shein: Chinese site builders in USA

Attach pdf file

Start story of tooth brush

Start stories of Broom maker Libman

The fakers. Fake it till you make it - why Holmes and SBF played the world?

Nicola Motors, Theranos

TBD

Refridgration company FF bought

To be entrepreneur you must be patient and have a plan.

To have a plan you must have experience.

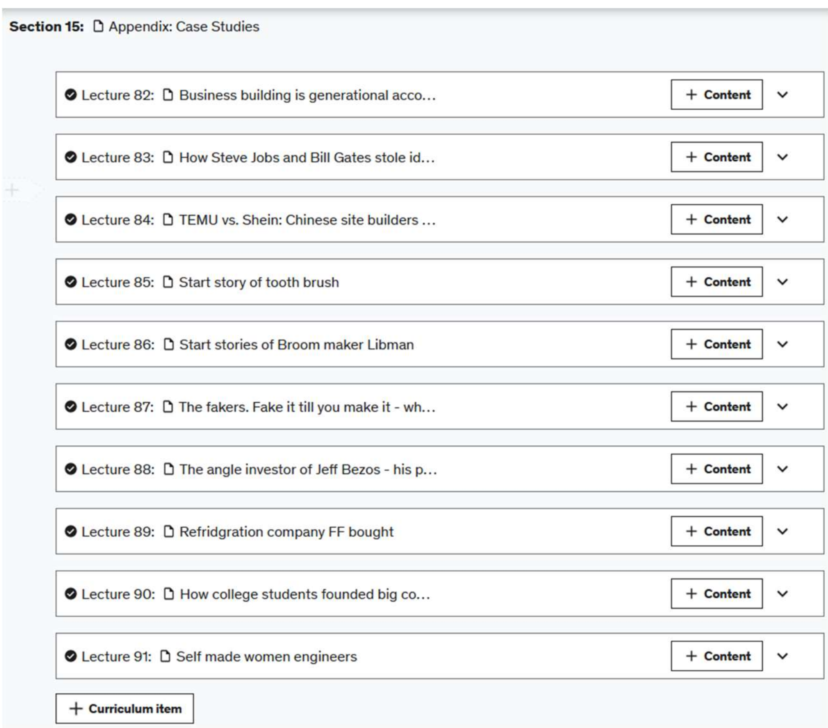
To have experience you must have failed before.

Many smart people wait forever so they could not fail. They never even start.

How college students founded big companies - Dell, Domino's Pizza, Subway

How people founded companies in dorms

Self made women engineers



Appendix: Analogies

Riding bicycle analogy

Airplane analogy

Extra extended

Life of making a product - a gas sensor

Life of making an air purifier

Every business is epic. Every business is a deepest dive.

To be extraordinary you can not be accomplished like everyone else. You need to do three things no one can do.

1. Start focus early.

2. Start making things early.

3. Start selling what you make early.

Never wait for a perfect plan to start.

Fortune favors the bold. You may indeed be very smart and very kind, but if you do everything by the book, you will end up being common.

At a school classroom, getting an A gets you to the top. In society and industry, getting an A just becomes statistically common.

If you just sit there and think, you will end up holding a good job, being a middle class person, pay taxes, and retire without any harm done.

Business is a strategy game. You are playing against another player, always.

Addition

McDonald's Ray Kroc – design after start. Why divorce.

Traction -