

NUS School of Computing

Starter Kit



About The Furnace in Brief

The Furnace is NUS School of Computing's (SoC) early-stage incubator. Here is our URL:

<http://www.comp.nus.edu.sg/entrepreneurship/>.

Why?

The fastest growing companies in the world are tech companies. The most famous examples of entrepreneurship in recent times, from *Apple* to *Baidu* to *Facebook*, are computing companies. With so many smart students and talented faculty, SoC is a great source for high tech high growth startups. The Furnace seeks to help aspiring entrepreneurs as they take their first steps towards building a great company.

What?

We provide experienced mentorship for startups associated with SoC, as well as office space, network connectivity, telephone lines and furniture. There's overflow spaces for interns as well as a lounge to relax in. The best part of the deal is that while there's a nominal monthly charge, you don't need to pay unless and until you are able to afford it.

Who?

For: students, alumni and staff of SoC and NUS. Visit our website to find out more about eligibility and how to apply.

Mentoring is provided by SoC faculty, including adjunct faculty who have founded and run startups and made venture investments.

When?

Whenever you are ready. But right now would be a good time to drop us an email. Singapore's tech startup scene has been gaining momentum rapidly over the last few years and we've seen some successes, from *Mozat* to *tenCube* to *Zopim* and *Carousell*. We think the pieces are falling into place for a huge tech startup success out of Singapore. It could be you!

How?

There is no single recipe for entrepreneurial success. We are big fans of Lean (the movement started by Eric Ries, Steve Blank and others), but we are not Lean purists. We pull the best ideas from multiple sources – and from our extensive personal experience – depending on what your startup most needs. Each startup is unique.

...and what's so special about The Furnace?

There are many incubators and accelerators out there. How are we different? Four main ways:

- Notice our tagline: A Foundry for Digital Entrepreneurs. We want to nurture successful ventures. But we also want to help create great tech entrepreneurs. If you have the passion, dedication and courage to become an entrepreneur, we'll help you become a master of the art.
- We are the NUS School of Computing. We love cool new technology, but not as an end in itself. First and foremost a startup needs to be aligned to what customers want. But unique, innovative, deep technology often provides the best long-term sustainable advantage for a new venture. Some of our startups are founded on research from SoC; all our startups are invited to draw on it.

- Incubators are by definition early-stage. We are even earlier than most, and happy to be your bridge to a later-stage incubator or venture fund.
- We don't take equity and we don't take ownership of your IP for being with us. How great is that!

Contacts

- Faculty Contact: Prof Francis Yeoh (disyeohf@nus.edu.sg)
- Administrative Contact: Ms Ang Cheng Lian (furnace-l@comp.nus.edu.sg)

Guidelines for New Arrivals

Welcome!

The Furnace is a community of entrepreneurs who have some affiliation to SoC. The value of any community relates directly to the extent to which members help and support each other and work towards the common good.

We intend to build the Furnace into a startup friendly supportive community. As a startup company, you have much in common with other occupants – you are trying to find traction in your business model, hire the best people, write great code and get investors while juggling a hundred other pressing tasks at hand. But it would be foolish to plunge into such activities fully, without stepping back now and then to network with people, listen to feedback and be open to serendipitous encounters. The Furnace is a ready community for this purpose, with faculty mentors, fellow entrepreneurs or even their associates who can provide useful feedback, suggestion and advice. So share with each other freely – there is no need for secrecy: the competition is not among yourselves, it is with the market out there!

Get to know your fellow entrepreneurs – share useful startup tips with one another, be one another's beta users, have a chat over coffee, go out for lunch together. Work with your office door open sometimes – indicate your availability to engage. Smile!

We will organize sessions for interaction regularly (with beer maybe?) to help you relax and get to know each other. We could invite experienced entrepreneurs or investors to share their experiences or have 2-3 of you talk about your business idea each time. We hope the Furnace will become not just a useful supportive community but one that is fun as well!

About Mentors

The biggest cause of failure in startups is the lack of proper guidance during the seed and early phases of development. Guidance, whether on technical, operational or business issues, provided by suitable mentors with the right knowledge, experience and background will greatly increase the chances of a startup's success.

When you get admitted to the Furnace, you will be assigned to a faculty mentor, whose role is to provide your company with mentorship and guidance on a regular and systematic basis. You are 'accountable' to the mentor during your stay at the Furnace so it is important that you work out a schedule to meet regularly with your faculty mentor. Your faculty mentor's input will be an important factor in determining the renewal of your stay in the Furnace.

In addition to the faculty mentors, we will identify suitable people in the university or industry who are able to provide ad hoc guidance to you in their specific areas of expertise. These could be faculty members who are technical experts in areas important to your business such as databases, security or data analytics. They could also be practitioners in industry verticals such as telecommunications, retail and healthcare. The Furnace will endeavor to identify such ad-hoc mentors and arrange access for consultation.

Services

Over time, we aim to build up a network of start-up friendly professional enterprises to provide a range of services in areas such as legal and IP issues, marketing communications and regulatory matters. As much as possible, we hope to secure help on a pro bono basis. However, in some cases, startup friendly fees may be applicable.

Introduction to Lean

"Lean" is a startup philosophy that has emerged in recent years. We think it makes a lot of sense – the best approach for most startups. Here's a quick summary of it:

You have an idea. It could be a winner or a loser. We don't know. You don't know either. You might think you do, but you don't. Really!

So before you build anything, get out and talk to potential customers. Find out if they're interested in your idea. If not, you pivot to a different (though often closely related) idea.

Then build an MVP (Minimum Viable Product) to show people what you mean... and talk to more potential customers

This may take a few iterations. It ends when you discover something customers are dying to get their hands on. At that point you're on the right track.

Being in The Furnace is all about finding that right track. In other words:

- Don't build stuff based on a hunch that people will buy it. Your first idea is almost certainly a dud.
- When you do build stuff, do as little as necessary as quickly and cheaply as possible.
- Get out of the office and talk to people.
- Don't keep your ideas secret. You have more to gain from sharing than from keeping your ideas to yourself. For every startup that has its ideas stolen, there are hundreds that fail because they created something nobody wants.

We will explain this more at our first meeting with you. In the meantime, here are some links:

- http://wikipedia.org/wiki/Lean_Startup
- <http://theleanstartup.com/>
- <http://www.slideshare.net/startuplessonslearned/lean-startup-presentation-to-maples-investments-by-steve-blank-and-eric-ries-presentation>

Customer Development

Absolutely central to the Lean Startup approach is what's called "Customer Development" (CustDev). The main element of this process is a large number of in-depth interviews with people who think would be typical customers for your startup.

*Doing customer interviews is much harder than most startups think and **if you do it badly you will probably head off in a bad direction and doom your startup to failure before you even start.** So here are some key points and some links to more information*

- These interviews should be done face to face where possible. Second-best is a telephone interview. As an absolute last resort (only if the first two are impossible) you can use chat or email.
- A typical interview lasts 60 minutes. A short one lasts 30 minutes. Anything less than that is unlikely to achieve the insights you need.
- They're best done with one subject and two of you from the startup: one asks the questions, and the other takes notes.
- Write down the questions you want to ask – typically at least 30 to 50. But don't step through them in the interview – that makes it too formal and you may miss the most valuable insights. Instead, try to memorize at least half of them and if possible, ask them in a sincere casual way that doesn't sound like you're going through a list. Later in the interview you can take out your written list and check which questions you missed.
- Don't delegate this. It's a job (arguably the most important job) for the key founders of the startup. Getting to know your customers in depth is about the most important things that founders have to do.
- In a typical Lean process, you have to do a large number of these interviews. The father of Lean, Steve Blank, recommends doing at least 100. In some cases, 30 may be enough. But 5 to 10 is almost never enough.
- This is not about selling or convincing – in fact it's the opposite. Your goal is **discovery**, seeking to understand the customer in depth: what they do (that's related to your idea), how they think and how they feel emotionally. Put another way, your job here is to act like an anthropologist: to understand in the most objective way while minimizing the influence you have on the results.
- The biggest problem you face is that most people are nice: they want to be supportive and encouraging, telling you that your idea is great. And in that moment, they may even sincerely believe that. The trouble is that when it comes to actually using your product or service when you are not present, they feel no obligation to be nice and their actions may be totally different to what they said in the interview. Many of the techniques in the links below are designed to minimize this problem.
- Always keep an eye (or ear) out for any moment where the interviewee says "What you're doing is cool, but if you did X instead that would be really great". X is usually an idea related to yours but different. And it very often turns out to be a much better idea: X is often something the customer wants more than your idea. Of course if you hear this from only one interviewee, or each interviewee wants different things (X, Y, Z etc), it may not be significant. But if multiple interviewees tell you that what they **really** want is X, you should consider pivoting to X.
- The job of the note-taker is to write down as much as possible of what the interviewee says in the most neutral unbiased way possible. If you're doing this right you should come away from a typical 30–60 minute interview with several pages of notes.
- After the interview, preferably the same day or the next day, no later, go through the notes and organise them, as you do so thinking about what's important, and what actions you should take. (But don't be too quick to act - a comment from one or two people may not be significant. Generally, wait till you see a pattern from 5 or more people before acting on it.)

- After your interviews, especially the first few you do, the two of you who did the interviews should ask each other "What could I do better?" Like most things, it takes practice to get good at this stuff. But it's a powerful life-skill, so it's worth striving to constantly improve at it.
- Typically, you do at least two rounds of interviews:
 - One set at the start, where you have nothing to show. This is entirely about discovery as described above.
 - Later sets are done with an MVP – a Minimum Viable Product. (If you don't know what that is, see the links in the previous section.) But never start these interviews by showing off your MVP. Even at this stage you should spend the first 30% or so of the interview just asking questions and seeking to understand the customer in the most unbiased way. Only once you've done should you bring out the MVP and start getting his/her reactions to it.

And here are a set of links on CustDev, especially how to perform interviews

A whole list here of sources here:

<http://leanstartup.pbworks.com/w/page/54918676/Customer%20Interview%20Templates%20and%20Resources> /
haven't been through all of them, but the ones I looked at are good.

Definitely watch the talk here

<http://vimeo.com/40192415>

His concept of the "mom test" is great!

This is wise stuff too...

<http://grasshopperherder.com/1-customer-development-tips/>

https://training.kalzumeus.com/newsletters/archive/validating_product_ideas

More...

<http://leancamp.co/#about>

<http://customerdevlabs.com/2013/11/05/how-i-interview-customers/>

This is good even though he seems not to really understand the "5 whys" technique. The haircut is pretty cool too. ;)

<http://www.cindyalvarez.com/roundups/10-things-ive-learned>

<http://leananalyticsbook.com/scoring-problem-interviews/>

<http://leanstartup.pbworks.com/w/page/54918676/Customer%20Interview%20Templates%20and%20Resources>

<http://www.skmurphy.com/blog/2011/10/19/tips-for-b2b-customer-development-interviews/>

Naming Your Company

Many startups start off with a bad name. They find they have to change it later, which is always painful. Or they stick with a name that they should have changed, building a startup with one hand tied behind their back. These guidelines will help you avoid the main pitfalls.

A good name needs some thought and a little research. It may take at least a few hours' work to find one. Don't plunge in without thinking – for example don't choose it because you want to name your venture after your favorite cartoon character or favorite fruit (maybe the latter worked for Steve Jobs, but times have changed!).

To find a good name, you usually have to generate a lot of names. Keep a list. Sometimes you may end up with dozens of names on the list before you settle on one.

There are several aspects to choosing a good name. Ask yourself the following questions:

- Does it attract customers?
- Does it give me enough freedom to pivot?
- Can I fully own it?

Here are more details.

Does it attract customers?

A great name appeals to the kind of person who will pay for your product/service. For these people, it does one or more of the following things:

- It's memorable. As soon as they hear it, it sticks in their mind and doesn't let go – often because it conjures up a strong image. One of SoC's startups is called TinyWhale – a great example. As well as being hard to forget, such names often act as memes (<http://wikipedia.org/wiki/Meme>) – we tend to pass them on to others.
- It "resonates" for them – i.e., conjures up positive feelings that are in sync with what your startup needs. If you're doing something for gamers, Razer is a good name. If you're offering a financial service for people's savings, pick a name that sounds safe and reliable.
- It tells them what you do or what you're offering (e.g., YouTube).

To check this, bounce the name off some friends, family, etc and see what they say. Try to pick people who are close as possible to the kind of people you think will be your customers. Do they like it? Does it sound intriguing? Does it sound trustworthy? Do they smile when they hear or see it (French Connection UK – FCUK - is a good example of this!) Can they guess what it does?

And after a few days, ask them to see if they still remember the name.

Does it give me enough freedom to pivot?

Don't pick a name that limits you narrowly to one kind of product. One of our SoC startups initially called themselves DocPHP – way too limiting. Later they renamed themselves to Novatap, a far better name (and used DocPHP for their first product, which is fine).

Names that are abstract (Skype) or say nothing at all about what you do (Amazon) give you the most freedom to pivot. Often these are best, although you sometimes need to set this off against the fact that they don't tell people what you do (unlike YouTube, for example).

Can I fully own it?

Ideally your name is unique. Ideally you are the sole and undisputed owner of the specific sequence of letters (and/or numbers) that make up the name, everywhere in the world.

Factoring in all the other considerations, you may not quite be able to achieve that, but try to come as close as you can.

Here are some checks to do:

- Is the .com domain name available? If so – and you are happy with the name in other ways – go ahead and buy it for 1 year. Services such as GoDaddy usually let you do this for under \$20. (You may want to get a couple of other domains for your name, e.g., .org & .net; these are often offered along with the .com name for a few dollars more.)

If the .com name is taken – no matter how much you like the name – in most cases you should drop the name and find another. There are occasional exceptions: for example, if you are almost certain that your company will only be in China for the foreseeable future, owning the .cn name(s) may be enough. But in most other cases, keep hunting till you find a name for which you can own the .com.

- Do an Internet search for the word, including alternative/similar spellings and make sure there is nobody else doing something close with a similar name. This may take you an hour or more, but it's worth it.

If your name is completely unique, one advantage is that whenever you search for it in future, you will know that whatever results you get are about you – only you. So, for example, the number of results returned by a Google search is a good indicator of how much global mindshare you are generating.

- Go to <http://www.uspto.gov> and do a quick trademark search. Again, the issue is to check that no-one has the same/similar idea and is in the same sector.
- Try dropping your name into Google Translate using the "Detect Language" option. If it is recognized in any major language check it doesn't mean something negative. There's a famous story of a car called the Nova, which sounds fine in English. But in Spanish: "no van" means "doesn't go!"

As well as the above, here are some other factors – a bit less important, but worth considering:

- Shorter is better. Shorter names tend to be easier to remember, and are certainly easier to type into a browser. But only insofar as you can own the name. Nowadays you probably won't be able to find a single-syllable name for which the dot-com name is available. If that's the tradeoff, go for something a bit longer (but not too much).

- Does it roll off the tongue easily? Some names sound elegant when said, others are ugly. Some are easy to say, some feel like tongue-twisters.
- Is the spelling obvious from the sound and vice versa? This isn't a huge consideration, but if you don't meet the former criterion you'll have to spell it every time you tell someone verbally about your venture. And if you don't meet the latter, people may say it differently after reading it, which can sometimes cause confusion.¹

Be careful when you contract your name to form a domain name. Some can be read another way—which may be hilarious (OK) or just sound really bad (not so good). A company called Experts Exchange has the domain name <http://www.experts-exchange.com>. Apparently, they started out with the domain name *www.expertsexchange.com* but then realized there was a different way to read that!

¹Pete has an example of the latter from personal experience. He founded a startup called *muvee*, pronounced *mew-vee*. But many people just said it like 'movie.' And some people said *mew-vay*. It's a good name in many ways – meets most of the criteria mentioned here – but in this respect not quite so good.

Startup Lessons Learned the Hard Way

Slava Akhmechet, founder of RethinkDB, wrote a list of 57 lessons that he learned as a digital entrepreneur. I (Pete) have never seen so much startup wisdom packed into such a small space.

Here is the URL: <http://tinyurl.com/kenfv8p>. The list is reproduced in full here, but do visit the original article. He gives links to two other 'startup lessons learned' lists that may provide you with more food for thought.

People

1. If you can't get to ramen profitability with a team of 2 – 4 within six months to a year, something's wrong. (You can choose not to be profitable, but it must be your choice, not something forced on you by the market.)
2. Split the stock between the founding team evenly.²
3. Always have a vesting schedule.
4. Make most decisions by consensus, but have a single CEO whose decisions are final. Make it clear from day one.
5. Your authority as CEO is earned. You start with a non-zero baseline. It grows if you have victories and dwindles if you don't. Don't try to use authority you didn't earn.
6. Morale is very real and self-perpetuating. If you work too long without victories, your investors, employees, family, and you yourself will lose faith. Work like hell not to get yourself into this position.
7. Pick the initial team very carefully. Everyone should be pleasant to work with, have at least one skill relevant to the business they're spectacular at, and be extremely effective and pragmatic. Everyone should have product sense and a shared vision for the product and the company.
8. The standard you walk past is the standard you accept. Pick a small set of non-negotiable rules that matter to you most and enforce them ruthlessly.
9. Fire people that are difficult, unproductive, unreliable, have no product sense, or aren't pragmatic. Do it quickly.
10. Some friction is good. Too much friction is deadly. Consider firing people who are behaving badly and causing too much friction, even though they may be doing a good job.

Fundraising

11. If you have to give away more than 15% of the company at any given fundraising round, your company didn't germinate correctly. It's salvageable but not ideal.
12. If you haven't earned people's respect yet, fundraising on traction is an order of magnitude easier than fundraising on a story. If you have to raise funds on a story but don't have the reputation, something's wrong.
13. Treat your fundraising pitch as a minimum viable product. Get it out, then iterate after every meeting.
14. Most investor advice is very good for optimizing and scaling a working business. Listen to it.
15. Most investor advice isn't very good for building a magical product. Nobody can help you build a magical product – that's your job.

²This one depends on the case. If you foresee that different people may make very different levels of contribution to your venture (e.g., one full-time, another half-time), but don't know how it will actually pan out, it's probably better not to agree on the split up front, but to agree on a set of guidelines you will use to decide the split at a given trigger point such as a first investment round.

16. Don't fall in love with the fundraising process. Get it done and move on.

Markets

17. The best products don't get built in a vacuum. They win because they reach the top of a field over all other products designed to fill the same niche. Find your field and be the best. If there is no field, something's wrong.
18. Work on a problem that has an immediately useful solution, but has enormous potential for growth. If it doesn't augment the human condition for a huge number of people in a meaningful way, it's not worth doing. For example, Google touches billions of lives by filling a very concrete space in people's daily routine. It changes the way people behave and perceive their immediate physical surroundings. Shoot for building a product of this magnitude.
19. Starting with the right idea matters. Empirically, you can only pivot so far.
20. Assume the market is efficient and multiple teams will discover valuable ideas nearly instantaneously.
21. Pick new ideas because they've been made possible by other social or technological change. Get on the train as early as possible, but make sure the technology is there to make the product better enough that it matters.
22. If there is an old idea that didn't work before and there is no social or technological change that can plausibly make it work now, assume it will fail. (That's the efficient market hypothesis again. If an idea could have been brought to fruition, it would have been. It's only worth trying again if something has changed.)
23. Educating a market that doesn't want your product is a losing battle. Stick to your ideals and vision, but respect trends. If you believe the world needs iambic pentameter poetry, sell hip-hop, not sonnets.

Products

24. Product sense is everything. Learn it as quickly as you can. Being good at engineering has nothing to do with being good at product management.
25. Don't build something that already exists. Customers won't buy it just because it's yours.
26. Make sure you know why users will have no choice but to switch to your product, and why they won't be able to switch back. Don't trust yourself — test your assumptions as much as possible.
27. Ask two questions for every product feature. Will people buy because of this feature? Will people not buy because of lack of this feature? No amount of the latter will make up for lack of the former. Don't build features if the answer to both questions is "no".
28. Build a product people want to buy in spite of rough edges, not because there are no rough edges. The former is pleasant and highly-paid, the latter is unpleasant and takes forever.
29. Beware of chicken and egg products. Make sure your product provides immediate utility.
30. Learn the difference between people who might buy your product and people who are just commenting. Pay obsessive attention to the former. Ignore the latter.

Marketing

31. Product comes first. If people love your product, the tiniest announcements will get attention. If people don't love your product, no amount of marketing effort will help.

32. Try to have marketing built into the product. If possible, have the YouTube effect (your users can frequently send people a link to something interesting on your platform), and Facebook effect (if your users are on the product, their friends will need to get on the product too).
33. Watch Jiri Dreams of Sushi, then do marketing that way. Pick a small set of tasks, do them consistently, and get better every day.
34. Reevaluate effectiveness on a regular basis. Cut things which don't work, double down on things that do.
35. Don't guess. Measure.
36. Market to your users. Getting attention from people who won't buy your product is a waste of time and money.
37. Don't say things if your competitors can't say the opposite. For example, your competitors can't say their product is slow, so saying yours is fast is sloppy marketing. On the other hand, your competitors can say their software is for Python programmers, so saying yours is for Ruby programmers is good marketing. Apple can get away with breaking this rule, you can't.
38. Don't use a supercilious tone towards your users or competitors. It won't help sell the product and will destroy good will.
39. Don't be dismissive of criticism. Instead, use it to improve your product. Your most vocal critics will often turn into your biggest champions if you take their criticism seriously.

Sales

40. Sales fix everything. You can screw up everything else and get through it if your product sells well.
41. Product comes first. Selling a product everyone wants is easy and rewarding. Selling a product no one wants is an unpleasant game of numbers.
42. Be relentless about working the game of numbers while the product is between the two extremes above. Even if you don't sell anything, you'll learn invaluable lessons.
43. Qualify ruthlessly. Spending time with a user who's unlikely to buy is equivalent to doing no work at all.
44. Inbound is easier than outbound. If possible, build the product in a way where customers reach out to you and ask to pay.

Development

45. Development speed is everything.
46. Minimize complexity. The simpler the product, the more likely you are to actually ship it, and the more likely you are to fix problems quickly.
47. Pick implementations that give 80% of the benefit with 20% of the work.
48. Use off the shelf components whenever possible.
49. Use development sprints. Make sure your sprints aren't longer than one or two weeks.
50. Beware of long projects. If you can't fit it into a sprint, don't build it.
51. Beware of long rewrites. If you can't fit it into a sprint, don't do it.
52. If you must do something that doesn't fit into a sprint, put as much structure and peer review around it as possible.

53. Working on the wrong thing for a month is equivalent to not showing up to work for a month at all.

Company Administration

54. Don't waste time picking office buildings, accountants, bookkeepers, janitors, furniture, hosted tools, payroll companies, etc. Make sure it's good enough and move on.

55. Take the time to find a good, inexpensive lawyer. It will make a difference.

Personal Well-being

56. Do everything you can not to attach your self-esteem to your startup (you'll fail, but try anyway). Do the best you can every day, then step back. Work in such a way that when the dust settles you can be proud of the choices you've made, regardless of the outcome.

57. Every once in a while, get away. Go hiking, visit family in another city, go dancing, play chess, tennis, anything. It will make you more effective and make the people around you happier.

Notes on Patents and Patenting

Should I apply for a patent?

Are you wondering if you should apply for a patent? Here are some notes to help you get started.

A patent gives you a monopoly: it prevents competitors from doing something the same way your product or service does it.

But the first thing to realize is that patents only make sense for startups in some cases. They're costly and time-consuming, the scope of the monopoly is usually narrow and there are many cases where even if you have a patent and a competitor blatantly copies you, you'll find that you're unable to enforce it - typically because the competitor has far more money and will draw out the legal process until you run out of cash.

So patents only help you in certain cases. Many successful startups don't use patents in their strategy.

And patents are almost never the most important element of a successful business: making your customers super-happy is far more important in nearly every business!

Nevertheless, patents can be one useful part of a startup's arsenal. Investors such as venture capitalists are often keen to see one or more patents in a startup's portfolio: patents can give you credibility, indicating that you understand the importance of being differentiated from your competitors and showing that you have the imagination and determination to use technical innovation as a way to achieve competitive advantage.

Patenting only makes sense when you have a strong **invention**: when you have come up with a solution to a problem that's both clever *and* new in the world. See:

<https://www.ipos.gov.sg/home>

Let's look at those two aspects (*clever* and *new*) in a bit more detail.

What is an inventive step? Do I have one?

How do you decide if what you have is clever enough to merit a patent? As you can see from the link above, the requirement is as follows:

The improvement must not be obvious to someone with technical skills or knowledge in the invention's particular field. If an invention is new yet obvious to a person skilled in the art, the invention would not fulfil the inventive step requirement.

(This is for Singapore, but it's basically the same in other countries.)

But how obvious is obvious? What's obvious to one person may not be to another – right?

To some extent, the answer is to go with your gut feel. Most times we tend to know when we've done something clever – when we've had an ingenious insight. Patents used to call it a "flash of genius"; that phrase is now regarded as a bit of an overstatement, but it's something akin to that.

(On a quick aside, there's a film called *Flash of Genius* all about a patent story. It's quite a nice intro to some patent concepts and practice, and quite a well-made film: <http://www.imdb.com/title/tt1054588/>)

If you feel that you had one or more of those flashes and have perhaps invented something, keep reading this and move to the next step. If not, probably forget patenting and focus on other ways to make your business successful.

You can also ask the Furnace mentors for an opinion. They'll ask you to describe what you believe is the core of your invention and then advise you on whether they think it's potentially a good candidate for a patent.

How new does my idea have to be?

For any patent to be granted, one requirement is that some aspect of what you describe is new.... **and that means new in the entire world**, not just in the country you're applying for the patent in. Specifically, there must be some aspect which has never before been publicly described in any prior patent, academic journal, website, public talk etc.

That's a high bar! Be prepared for disappointment. Most ideas – even the ones that feel like a true “flash of genius” - turn out not to be new. Bear in mind that to date about 9 million patents have been filed in the USA alone, not to mention all the published papers, existing products and other sources... plus of course all of the above in other countries.

For every idea that you think might be new, be prepared to discover that the vast majority are not. Sorry! But that's just how it is.

Another possibility that happens quite often is that your initial or primary idea turns not to be new, but you come up with a special twist or add-on to it which is. And that's a potential candidate for a patent... although you also have to decide whether the scope of monopoly such a patent would give you justifies the cost. Luckily patenting costs can start quite low, so if you think there's a chance it might be valuable enough, you can start the process cheaply and decide later whether to incur the far higher cost of completing it. See the section below on costs.

How can I find out if my idea is new?

To establish how much (if any) of your idea is new, you have to do some searching of the “prior art”. (That's the patent term for everything that's published in the world before the date you file your patent: patents, papers, videos, product brochures/manuals, etc.)

Do this searching yourself. Unless you have loads of cash (and in most cases even if you do), you should not leave it just to a patent attorney.

There are two things to realize upfront about this searching:

- **It's an imperfect process.** You can't possibly search all the prior art across the world. What you do instead is to spend a few hours on some sample searches, trying to get some sense of whether your idea **might** be new, mainly by searching through earlier patents.

Many times, you'll soon realize your idea is not new and you can save yourself any more time or cost by abandoning the idea of trying to get a patent for it.

Best case, you won't find any prior art that “reads onto” (another bit of patent jargon) your invention... in which case you have a chance that it may be new. **But even in the best case, it's only a chance:** because you're only doing some sample searches (and because prior art can be in languages you don't know, plus other reasons), it's possible – in fact common - that there's relevant prior art you won't find out about till later, often months or

years into the patent process. Patenting is a lottery: **the purpose of your upfront searching is simply to eliminate some of the no-hope gambles.** That's the best you can do.

- **It's not much fun.** There's something a bit depressing about the process of searching and hoping **not** to find.

The answer? **Grit your teeth and do it anyway.** Spend at least a few hours (anything up to about 2 full days) doing it thoroughly. If you shy away from doing that, you run a very high risk that you'll invest far more than 2 days - plus loads of money and emotional energy - on a doomed mission.

How do I perform these upfront sample searches?

The short answer is: search US patents. The USA has the largest number of patents, especially in the world of digital / high tech, and all its patents are published online.

Obviously a search only of US patents isn't exhaustive; again, an exhaustive search of prior art just isn't possible. But firstly, most inventions of value are filed in the US; if the inventor is say Brazilian, she's likely to file in Brazil but also in the US, especially if it's a software or other digital invention. Secondly, even if some breakthrough was initially described in scientific papers, if it has commercial value it's likely to have been filed as a patent too.

So the US patent database is your shortcut to getting that rough sense of whether your idea might be new. US patents are available in a number of places online. The two most useful for the average person are:

- Google patent search: https://www.google.com/?tbs=pts&gws_rd=ssl
- The United States Patent and Trademark Office: <http://www.uspto.gov/>

So you might start your search by going to <http://patft.uspto.gov/>, clicking on "Quick Search" <http://patft.uspto.gov/netahtml/PTO/search-bool.html> and entering a couple of terms.

If you want more control you can go to the "Advanced Search" at <http://patft.uspto.gov/netahtml/PTO/>. For example, if you have an idea in the area of geospatial systems, you might have a hunch that Google has some patents in the area so you can enter a search such as:

AN/google AND SPEC/"global positioning system"

Note that even that limited search gives more than 1600 results – which gives you some idea how much prior art there is!

As you start to find US patents, get used to referring to them by patent number. For patents that are relevant to digital startups, these will generally be numbers from about 7 million upwards. You can access any patent fast by doing a "Number Search" at <http://patft.uspto.gov/netahtml/PTO/srchnum.htm>

and entering a patent number: for example if you enter "8,825,373" at that address it will take you to a Google patent relating to vehicle navigation.

It can also be effective to search on inventors' names. For example, if you see an inventor in a patent that's close to your idea, see what else (s)he has filed, eg for the above Google patent, you might do:

IN/"Martin; David R"

IN/"Martin; David"

(Of course, David Martin is a common name, perhaps even with an R in the middle, so this will often retrieve irrelevant patents; you can usually guess which are relevant by a quick look at the title.)

One limitation of searching using text strings is that it won't retrieve patents which use slightly different terminology - for example, if a patent talks about "geospatial location system" but not "global positioning system", a search on the latter will miss it. ***This is extremely common, so you need to go one step further: to do a search by classification number.***

For example, if you look at that Google patent 8,825,373 you'll see that it says the Current International Class is G01C 21/34. With that information you can go back to the advanced search at:

<http://patft.uspto.gov/netahtml/PTO/search-adv.htm> and enter the search:

ICL/G01C21/34

Now you're seeing all the patents in that sub-class.

If you wonder what sub-class G01C 21/34 is, then you can search for its definition here:

<http://www.uspto.gov/web/patents/classification/>

For this example, the answer is here:

<https://www.uspto.gov/web/patents/classification/cpc/html/defG01C.html#G01C21/34>

So subclass G01C 21/34 is about "Route searching; Route guidance".

In summary, an adequate upfront search usually involves moving between 4 types of search:

- Quick Searches on one or two keywords
- Advanced Searches using names of companies or inventors
- Advanced Searches using Classification Numbers; you usually get these Classification Numbers from patents retrieved by other searches, picking the ones that are closest to your idea
- Patent number searches to go quickly to a specific patent.

How much does it cost to get a patent?

It's very hard to give a fixed answer to this because there are charges at different stages and it depends on lots of factors: for example, how much you can do yourself without the help of a patent attorney, which countries you file in, how much pushback you get from the examiners in different countries, etc. (Pushback means that an examiner rejects your patent as it stands. At that point you can abandon it or re-apply; typically, a patent goes through about 2 to 4 of these amendment cycles before it gets accepted or you give up.)

A rough ballpark figure for a patent that you file in Singapore and the US with the help of a patent attorney and which requires couple of cycles of amendment to get the patent granted is around S\$20k.

But you can kick off the process very cheaply and it often makes sense to do so. To file a patent yourself in the local Singapore office costs only S\$160. This will establish your "priority date" (the date used further down the line to establish who first described an invention) and will give you a year to think about and decide whether you want to proceed.

Self-filing an Application

If you want to consider the S\$160 self-filing, here are some links to get you started:

- Overview of the local process:
<https://www.ipos.gov.sg/home>

- Forms:
<https://www.ipos.gov.sg/resources/patent>

IPOS, our local patent office, IP2SG which will move more of their processes online :

- <https://www.ipos.gov.sg/resources/ip2sg-faq>

Which countries should I file in?

The short answer is: start off in Singapore, then within a year you can decide whether it's worth filing in other countries. For most software/digital inventions your main aim should then be to get a US patent. So SG+US is the usual basic combo that companies here go for.

A slightly longer answer...

All patents are all local to specific countries (eg SG, US) or regions (eg EU). Because Singapore is a small country and for digital technology, a patent that is only granted in SG isn't very valuable – it will only give you a monopoly over products made or sold in SG. But if you get a US patent you have a monopoly there, which is valuable because most software/digital companies need to operate in the US.

If you want to consider a few more places beyond SG+US, it depends where you expect your markets to be, but if you don't know, or your strategy is global domination, you can consider adding according to the size of economies: in Asia the first choices are usually China, Japan and maybe S. Korea, and in Europe it's Germany, UK, and France (the EU is also becoming more and more like a single territory for patent purposes which makes it very compelling – another economy and population roughly the size of the USA)

Can I bypass filing in SG and just go for a US patent?

In theory, yes. But it doesn't make any sense to do so.

First, there is a strict requirement (a national security issue) that anyone resident in Singapore, must get written approval if they want to file elsewhere. See:

- <https://www.ipos.gov.sg/protecting-your-ideas/patent/application-process/expedite-filing-to-countries-outside-SG>
- <https://www.ipos.gov.sg/protecting-your-ideas/patent/application-process/national-security-clearance>

If you file locally first, this gets taken care of and you don't have to go through the whole process of getting written permission.

Secondly, filing in SG establishes your priority date and you can do that for S\$160. You want to "plant that flag in the sand" as early and cheaply as possible.

So, in short, start by filing locally in SG unless you have some unusual reason for doing otherwise.

Does getting a patent mean I'm not infringing other people's patents?

No! Being granted a patent gives you a right to stop other people using your invention. It does not give any rights to do anything yourself. Here's a link that explains this as well as other stuff (from a US perspective):

<http://idearights.com/patent.asp>

Where else can I get local help and advice?

First, ask the Furnace mentors, some of whom have a wealth of experience in patenting.

Another source you can turn to is the NUS Industry Liaison Office (ILO), a division of NUS Enterprise. ILO handles IP generated by NUS students and staff during the course of their study or employment at NUS. This includes evaluating the invention for patentability (assessing the novelty, inventiveness and industrial applicability of the invention), drafting the claims for the patent, and managing the entire patent prosecution process from initial filing to grant and maintenance of the patent. ILO continues to manage the process for companies that license patent-pending technologies from NUS.

- <http://www.nus.edu.sg/ILO/for-industry>
- <http://www.nus.edu.sg/ILO/for-researchers/about-patents>

And of course, the Intellectual Property Office of Singapore (<http://www.ipos.gov.sg>), which has already been referenced a few times in the preceding text.

More info

Here are some links to other useful material and resources

Templates and help with legal docs: SG-based

<https://singaporelegaladvice.com/legal-templates/>

Templates and help with legal docs: US-based

<http://www.seriesseed.com/>

<http://www.clerky.com/>

Miscellaneous resources for entrepreneurs

<http://www.quora.com/What-are-the-best-productivity-tools-for-entrepreneurs>

<http://steveblank.com/tools-and-blogs-for-entrepreneurs/>

There are tons of resources for startups on the internet. Here are some useful ones.

Blogs

- Steve Blank – <https://steveblank.com/>
- Brad Feld – <https://feld.com>
- David Cohen – davidcohen.com
- Fred Wilson – A VC <https://avc.com>
- Marc Andreessen – <http://blog.jedchristiansen.com/2009/10/15/a-marc-andreessen-blog-archive/>
- Paul Graham – <http://paulgraham.com/articles.html>
- Eric Ries: Startup Lessons Learned – <http://www.startuplessonslearned.com/>
- Venture Hacks – <https://venturehacks.com/>
- Andrew Chen – <https://andrewchen.co/>
- Brad Feld and Jason Mendelson – <https://www.venturedeals.com/>
- Dharmesh Shah – On startups <https://www.onstartups.com/>
- Josh Kopelman – Redeye VC <https://redeye.firstround.com>
- David Hornik – VentureBlog <https://www.ventureblog.com/>

Podcasts

- Y Combinator
- a16z Podcast – Andreessen Horowitz
- DFJ Entrepreneurial Thought Leaders: Stanford University
- Masters of Scale - Reid Hoffman
- Product Hunt Radio
- Mixergy: Startup Stories
- Give First: David Cohen & Brad Feld

End of Starter Kit