[SQUEAKING] [RUSTLING] [CLICKING]

JOE HADZIMA: All right, Joe Hadzima here, back again for tonight, legal issues. And a couple things I want to make clear at the beginning. This is for background information only. And it's not legal advice, even though it says legal issues.

And the reason for that-- there are at least two reasons. One is, legal things are very fact-dependent. And so you could have similar facts that have different legal results. And I don't want you to apply a certain fact and assume you know what you're doing on that.

The second is laws change. Regulations change. We're seeing that right now in Washington with the new administration coming in. So things I say here tonight may not apply a year from now or five years from now.

What I would like you to do, though, and my goal here is to tell you some of the things you need to watch out for, not to make you a do-it-yourself lawyer, but to say, if I see this thing, I might want to be careful or I might want to consult with somebody, rather than go stumbling along and end up in a big pothole. So that's the goal. Excuse me.

The other thing is, I'm going to violate almost every rule of giving presentations. I'm going to probably overload you with information tonight. And the reason is I figure I have one shot at telling you about this stuff. And the slides and the video are things you could go back to if you have an issue.

Last night on our founders' panel, it was interesting to know that Peter Godart said, in talking about licensing, that he had looked at my licensing materials and it was helpful. Well, that was probably-- he must have taken the course five years ago or something. So I'll have some of those materials tonight.

So anyway, that's the agenda. And let's see if we can get going here. I'm going to approach this through the life cycle of a new venture. On the top going from left to right, we're going from the very beginning. You have an idea. And then proceeding to pre outside financing and then first and second round financings, et cetera.

Those are the stages of your venture. And down the left side, the topics that I'm going to cover-- intellectual property, legal entity, people-related issues, and some financing things. And so even if I don't get through all of it, I'll get you through at least some of the beginning phases of it.

We start off with the first two phases, which is I've got an idea, and then maybe I'm getting ready for outside financing. And we'll start with intellectual property. And in the next few slides, we're going to talk about who owns stuff and how do you protect it. OK, you with me so far?

OK, here we go. Well, why worry about intellectual property? This slide shows that back in 2015, 84% of the value, the market cap of the S&P 500 were represented by intangibles. Tangibles are things like, plant, equipment.

And if you think historically, if we go back to pre Industrial Revolution, wealth or value was pretty much ownership of land or maybe shipping to bring things from one thing of land to another. Then we hit the Industrial Revolution and wealth starts to get defined by plant and equipment and capital raised to be able to do that.

Now we're in a situation where a lot of what goes on is the intangible assets that a company has. Now, those include a bunch of things. It includes the people. It includes processes and ideas, et cetera.

Some portion of that intangible is intellectual capital. That is, things like ideas and processes. And some portion of that is intellectual property, that is, some intellectual capital that can be protected and worked with.

And so depending on the industry you're in, the amount of property you have versus capital may vary. But that's why this is an important set of stuff that you should know about. All right. We're going to talk about types of IP protection starting at the top, which is none. That is, you have some ideas and you just make them available to everybody. You don't do anything to protect them.

A trade secret, which by definition, you have a secret and other people don't know it. And so that can prevent others from doing what you're doing, because they don't really know what you're doing. It makes sense.

The next two categories, trademark-- and I'm going to go in more detail in the next future slides. Trademarks are symbols or words or stuff that express a brand of a company. And copyright, which is a protection of copying of something you write or produce.

Now, this says these enhance values, but they don't really block others. So Coca-Cola, Coke, has a trademark that doesn't prevent Pepsi from offering a similar product. They just can't do it under the name Coke.

A copyright, as you'll see, protects the expression of an idea, not the idea itself. So it does provide value to you, but it doesn't prevent others from using your expression of an idea.

Patent, on the other hand, cuts both ways. You have real rights, as you'll see, in a patent to prevent others from doing things. But in order to get a patent, you have to explain what it is you're patenting your idea. And you're given a limited-time monopoly, where you can control who uses that idea.

But by disclosing the idea, other people learn from it. And we don't like monopolies. We have antitrust laws, et cetera. But the concept of a patent goes back to the Constitution.

And the societal trade-off is, we'll give inventors a limited-time monopoly in exchange for them explaining their invention. And that way, we build on stuff over time. And it's viewed to be a good societal trade-off. There can be combinations of protections. For example, software can be protected using copyright and patent type stuff.

So those are the types. The duration of how long these last, trade secret could go on forever, as long as you keep it secret. At the other end, patents in the US have a life of 20 years from the date of filing. So limited-time monopoly versus long term.

The cost goes in the other direction. That is, in general, patents are the most expensive thing to get and maintain. Trade secrets can be expensive, if you have to protect plants and things like that. But in general, much less expensive.

So that's an overview of the types of IP. And now I'm going to dig into the individuals in a little more detail. So if we go to a trade secret, by definition it's a secret that gives you an advantage in the marketplace. I mentioned the formula for Coke.

The protection it grants is granted state by state. Each state has trade secret laws. And of course, the secret lasts as long as you keep it secret. So if you're going to disclose something to somebody, a real secret, you might use a non-disclosure agreement, where people agree that you're going to get this for a specific purpose for a certain time.

For your venture plan or your pitch, keep all of that secret out of it. They want to know, in Bob Jones' parlance, what is it that you have that's valuable and why is it valuable? They don't have to explain exactly how it's done. If people really want to know it, you go into a nondisclosure agreement.

OK, trademark or servicemarks. This is developing a name for yourself. It's like a brand. A trademark is for goods, servicemark is for services. It's what customers think of when they see something that's a symbol, a word, a phrase. It can be sound. It can even be color.

I think most people would recognize-- although I couldn't afford my shoes and probably wouldn't look good on me-- the red-soled shoe is protected by trademark. It's a mark under which you sell goods or services.

It can be what's called a house mark, describing the company. Like Lenovo is a brand. MGM Studios had the lion's roar, if you remember. You say, oh, that must be-- you don't even need to know what it says, the lion's roar. It can also be a product that that house offers.

So Lenovo has the ThinkPad as a laptop computer, and *Rocky* the movie was made by MGM. The rights for a trademark arise through use. If you begin using something, you potentially have a trademark on it and it can last forever. There's no limit on how long it can.

Now, registration federally-- and I should have said at the beginning, I'm only going to be talking about US law on all of this stuff. So federal registration of a trademark provides certain protections. Before you register your mark, you might want you should put TM next to the name you're using or claiming as a mark if it's a goods or SM if it's a service.

And only after you register it federally-- you don't have to register it, but only after you register it can you put the R in the circle. Now, the rights you get when you have a registered trademark is you're protected against other people using that mark for a given set of goods and services, with the exception of what's called a senior unregistered user.

So what does that mean? Well, when McDonald's went to register the golden arches and the name McDonald's for restaurants, it turned out that there was a restaurant chain in upstate New York named McDonald's.

And so that unregistered mark of McDonald's in upstate New York from this other entity, they can continue to operate in the geographic region. But once McDonald's registered federally, they couldn't move that restaurant to, say, Arizona, because McDonald's would have rights over that.

As I said, the right to the mark comes when you start to use it. Now, recognizing that in order to bring out a product to market, you're going to do all your research, you're going to do all of the branding, the art and everything. And if it's only after all of that that you actually transact or offer it for sale, that can be very expensive, only to find that you don't have rights to that mark.

So there is a provision called intent to use, where you can go to the US Patent and Trademark Office and file an intent to use mark that says, I intend to use this symbol, name, word, or anything with these goods or services. And they go through the analysis and they say, OK, that's good. You can do that.

But you then have to, within three years from the time that that registration is granted, actually use it, or it expires. I just filed an intent to use registration for one of our companies last month, before the rates went up on the trademark. It'll take about 18 months, they said, now for me to get a full thing. But I have at least nailed that in time.

In picking a mark, you should use something fanciful. Examples would be Apple or iPod. I mean, whoever thought of Apple as a name associated with a computer, much less a phone? You don't want to use something as merely descriptive. In fact, you can't really get a mark on something that's merely descriptive.

I went once to file a registration for the term Microdose for low-dosage aspirin that they were going to market. If you take a low dose of aspirin, it helps against potential heart attack. And after back and forth, they said, look, you're describing what the product does. It's a small dose. So we're not going to give you that one. We had to change it a bit.

You should look and see before you start using stuff. Is the mark available? And you go to the US Patent and Trademark Office, and there's a whole search thing you can use there. If you're going to get full registration, many lawyers will say, well, you ought to do a full trademark or servicemark search, which would look at everything from is it being used on the internet?

Is it in state directories? And these reports can run-- I haven't priced them out recently, but it could be $700 or $1,000 or something. So you're prepared before you go to the Trademark Office.

OK? All right. So copyright, it's the right to make and prevent people from copying what you do. It arises from creating a work. So if I write a letter to my mother as an author, I actually have a copyright on that. I don't have to register it or anything.

It protects the expression, not the idea or the function. So it's a great fit for music or literature, maybe not so well for software. And the reason, why does it only protect the expression?

Well, if Shakespeare wrote a play about a love triangle and he could get a protection of that so nobody else could ever write anything about a love triangle relationship, a lot of literature would disappear. What you can't do is exactly copy his particular expression of that idea.

Federal registration of a copyright is a plus. In fact, if you're going to bring suit to prevent somebody from copying, you do have to register it. The duration is long, 70-plus years, I think. Mickey Mouse was coming up a few years ago, and somehow they did some legislation to extend that.

The cost to register is low. It ranges, depending on what you're doing, anywhere from $10 to $500. And you register at the Library of Congress. And you have to actually deposit the work that you're trying to copyright.

So in the case of software, the question is, well, do I have to deposit my source code? I mean, anyone can see it then and see how I'm doing it. So there's a whole procedure for how you can deposit the source code redacted and a number of things. The idea is so you can prove what it is you're preventing other people from copying.

Years ago, I represented Arrow Maps back when they had paper maps. And I learned that in the map industry, people would put phantom roads on a map, roads that really didn't exist. And the reason was so if somebody else came up with that map they could say, well, you copied it.

And I don't know if that's why Google or self-driving directions sometimes leads you off into the wilderness. But the other thing that Arrow Maps did is they made a street directory book. So in Boston, if you had an address, it would say it's at the corner of Fairfield and Commonwealth Avenue.

And the city of Boston used that-- this is all pre-internet, of course-- to figure out where to send-- if something came in, where do we send the police car or the fire engine or something? So one year they got a call from the city saying, well, we don't need to order any more maps or directories. We're good.

Or I'm sorry, they didn't order it. So the guys at Arrow said to me, what do you think's going on? I said, well, you should ask them. Have someone call up somebody in purchasing and say, we've noticed you haven't put an order in for our new version of the directory. How many can we put you down for?

And the person on the other end of the phone said, oh, we're not going to do that anymore. We have our own copies. And so we simply took that statement, put an affidavit, and took it to court. And Boston paid up right away because they were copying the directory.

Even though you don't have to do it, it's suggested that you put a copyright notice on things you want to protect. Typically copyright the word, the year, the author, and then all rights reserved.

And that's because in certain countries, especially Latin America, if you don't do that, you lose some rights. Just put it on there. Don't put the C in the circle until you've actually registered. So you can see at the bottom of my slide, I put down a copyright notice.

For your venture-- this is really important-- make sure you own what you think you own. So the author of an original work-- be it software, a book, poems, or whatever-- the author owns that created work unless-- two exceptions. One is they're an employee and it's in the course of employment, or it's deemed to be a work for hire.

And so for example, I had a client who had spent a good deal of money developing an import/export computer software system. And they paid an outside computer firm to put it together.

And then they found out that firm had sold a license to another one of their competitors. And they came and they said to me, well, we paid all this money. Can't we stop them? And when we looked into it, we said, well, did you have an agreement as to who was going to own it? And it turned out they didn't. So they had basically spent a half a million dollars for something that they didn't own.

Now, the flip side of that is as a new venture, and you go to deal with a large company, and you say, I'm going to do some consulting work for you-- and consulting is a way that many ventures get off the ground. You work with your target customer market and learn more about them and what they want, and you make a bunch of money doing it.

And eventually you say, well, now I can turn that into a product. But that interaction with the large company, they're going to give you a consultant services agreement. And guess what it's going to say? We own everything that you create.

And don't blindly sign that. I have a standard thing for companies that I work with, which says, look-- I'll show you IPVision in a moment here-- if you ask us to do an intellectual property analysis on public data, you can own the specific report that we generate.

But if somebody else asks us the same thing with the same parameters, we're going to generate the same report. So you can't own how we generated the report. You can own the actual report.

Same thing if you're a software consultant working with a large company, you'll say, well, we have a bunch of tools and modules that we use in our development. We retain ownership of that. You can own the things we put together, but we retain and will retain ownership of any other things. And so you have to negotiate a little bit with that.

Finally, you should check open source, if you're in software. Are you using open source software in a way that violates the general license? If you actually modify the open source, you're supposed to give it back.

So typically there, you would have-- if you're using MySQL as a database, you're not going to change that code. Your interface to that code is yours. But if you start to mess with it, you might have a problem. And there are companies-- I think Black Duck was one of them-- that will run and look at your code to see if you're violating open source. And they will do that for investors, et cetera.

Now, what about copyright and artificial intelligence? Well, this is a big area right now. So it's well-established that to have a copyright, there has to be a human author. The Patent Office came up with-- or I mean the Copyright Office came up with an announcement a year and a half ago that says, well, AI creates stuff, so by itself, AI can't have a copyright. It's not a human.

But if you use artificial intelligence and you have sufficient human authorship, then you could get a copyright on it. So what does that mean? We're still trying to figure that out. But think about it. If you use DALL-E to make images and you're going to put it in a children's book and you write the text, probably OK.

What if you use DALL-E to do the image and you have ChatGPT do the text? Might be OK, if you're deciding how to create those two, put them together. It's still up in the air. The issue about using copyrighted material to train models, that's the one that's in litigation now. You can keep track of all of this at this address at the Copyright Office. That's where they say they'll keep updated on their view of it.

OK, patents. As I said earlier, a limited-time monopoly. It's a federally-granted right. You have to apply for it. It's for something that's new, non-obvious, and helpful. And this, along with all the other things where you register things-- copyright, trademark, things-- these are country by country.

You have to register in each country. There are some treaties that try to harmonize it, but you have to apply. So if I have a patent in the US, I can prevent others from making, using, selling, or importing my invention.

So if I don't have a patent in China, they can make it in China. They can't bring it to the US. I can't prevent them from making it in China unless I have a patent in China. Now, it's very much like real estate.

Most people think-- if you didn't know about it, you'd say, I have a patent on my invention. That means I can use it. Only I can use it. Well, that's true, but that doesn't mean there aren't any limits to it.

So if you think about the real estate analogy, I have a right to keep you off my property. I can keep you from trespassing. That doesn't mean that I can actually use my property.

What does that mean? Well, what if I had to walk across your property to get to mine? You could keep me off your property. I could keep you off my property. We'd have a problem. So it's the right to prevent others.

The claims of the patent are like the fence around. They define what the property is. So let's see if I can-- the duration is 20 years from filing. Let me give you an example. I use the coffee cup and the handle.

Suppose you came up with the idea that was not obvious, and nobody had ever thought about, of a vessel to hold a liquid. All right, and you get a patent on it. Great fundamental invention.

Now I come along and I patent a handle. Useful, not obvious maybe. I can't put my handle on your vessel to hold a liquid. And you can't put your vessel to hold a liquid on my handle, because we would be infringing each other's patents.

So the only way that can happen is a cross license between the two. So you get the point? OK. So requirements to get a patent, it has to be something new, not obvious. Prior art must be cited. Prior art is things that have been published or prior patents, et cetera.

Has to be useful. That's usually not a problem, if you looked at some of the weird patents that have gotten out there. It actually has to be patentable subject matter. Process, machine, manufacture, or composition of matter, or any improvement on that.

So originally, there was a whole thing for years about whether you could patent software, because that's an algorithm. And the way people started to do it, they say it's the machine. It's the use of that with a machine or something that makes it patentable.

It has to be not previously offered, sold, or publicly disclosed. Now, the publicly disclosed is an important thing. It has to be an enabling disclosure. So if I say to you in this room-- well, outside of an academic setting, let's say.

I say, I have invented anti-gravity boots. That's not enabling. I haven't told you how it works. But if I go into details and explain it all in a public setting, then that starts a one-year clock. I have one year in the US to file a patent application from the time I did an enabling disclosure, or I offer it for sale.

And if I don't, I can't get a patent. And this is an issue in some parts of the world. I was in Istanbul at the second Entrepreneurship Summit when they had people from countries all over the world. And I was mentoring a team from Egypt.

And they said, oh, we've got this great thing. We got this new way of doing wireless that's faster, better. It had all this great stuff. And I said, well, have you disclosed this to anybody? And they said, oh, yes, we published it in some prestigious journal.

And I looked at them and I said, could somebody figure out what it is you did from that journal article? And they thought for a moment and they said, oh, they might. And I said, well, I don't know.

You may have just blown the opportunity to get a patent anywhere in the world except the US, if it's been within one year. And you could just see their excitement in their faces just went-- so it's an important thing. You have one year in the US only.

It has to be not obvious to one of ordinary skill in the art. And there are different ways of showing that it's not obvious. Bob Langer you heard about last night, Bob, for some of his earlier patents, had arguments with the Patent Office about, look, if I look at the literature, they say this can't be done.

And oh, by the way, people are buying it. So it can't have been-- that I just did. So it can't have been obvious to people of ordinary skill in the art, if the art was saying can't do it, and then people are buying it.

And an important thing since a few years ago, we used to be a first to file jurisdiction. First to file the application would win. And there's a great history, if you follow Alexander Graham Bell and I think a guy named Gray. There was a big fight at the Patent Office.

We're now the first inventor to file. So if you don't get to the Patent Office-- you have to be an inventor. If you get there before somebody else who's invented something, you win. If not, you lose.

This becomes an issue with companies when they're doing joint ventures. When you're doing a joint venture between, say, a small company and a large company or even two large companies, there's always a question of, you bring your stuff, I bring my stuff. We do stuff together.

Who's the real owner of that thing in the middle? And we may learn things. And so there are cases where some large companies have gone off and filed first inventor type things. So important to remember.

OK. Whoops. Let me back up here. All right. So a couple of things for your venture. The first, you want to make sure you have a freedom to make, license, and sell your product. So you want to know, do you own it?

Now, just like copyrights, the inventor owns the patent. And there's, some exceptions, if you're an employee working for a company called Shoprite. But typically companies will have you, as an employee, sign an invention disclosure and assignment agreement where you agree to assign whatever you come up with to the company.

So if you look at it, you'll see some patents in the Patent Office. The inventor is listed. And then you go and look at who owns it and it's the inventor. Others, you'll see the inventor and then the name of the company.

What if it's licensed from the university? Do you actually own that? Did it go into the public domain, because you didn't file something, or you made an enabling disclosure, or you offered to sell it? There have been some cases on people not even actually showing the invention, but offering it at a trade show.

And that can be viewed as an on-sale bar to getting the patent. And then there's a strategy of, do you want a patent or do you want to disclose to prevent others? And I'll show you something about that in a moment.

So before you launch, you want to make sure you have freedom to operate. Is what I'm proposing to do-- does somebody else have a patent that could prevent me from doing it? Because you're going to spend a lot of time and money. And if you develop something and then someone comes along and says, sorry, you're infringing, investors are going to want to know about that.

Typically, you'll get a freedom to operate opinion from a law firm. That doesn't mean that you're not infringing. It just says, we've looked and we don't think there's a problem with what you propose to do. And part of that is that letter prevents you from having treble damages for willful infringement, which you could. If you willfully infringe someone's patent, they can hit you for three times the damages.

So prior art, if you're going to have freedom to operate, you've got to figure out what's out there. So this is See-the-Forest, which is one of the companies that I co-founded, IPVision. That's the web address.

And what this was, we were doing early-stage technology commercialization, primarily out of MIT. People would come in, professors, whatever, and they'd say, I got this great idea. And we would look at it and we'd try to figure out, well, what's out there?

At one point, we raised a bunch of money for a company. It was going to be-- it was a nano fuel company. And we wanted to make sure. If we were going to step onto the stage with a new fuel, we're going to be up against some pretty big players. So we ought to know what's there.

So on the advice of patent counsel, we hired an outside firm that went and looked all over the world and everything for prior art. And it cost us $70,000 or $80,000. And it took six months or more. And we had the results.

But in that six months in the US, there are about 5,000 new patents issued per week. So it was obsolete by the time we got it. So we had to figure out, is there a better way to do this? And we came up with this idea of patent mapping.

By the way, if you're in the class or in the MIT community, if you go to see-the-forest.com and register and send me an email saying what you're doing, we'll upgrade you to the premium version as part of our giveback.

But what is it? So this is an example of a patent map. The boxes on the map are patents or patent applications. The left edge of the box is the publication date or the issue date.

The tail to the left of the box is when the application was filed. And the lines connecting the box are the citations. When a patent issues, as part of the prosecution, you have to disclose to the Patent Office all prior art of which you're aware.

And the examiner looks at that and decides whether what you're claiming is allowed over the prior art. And they list in the patent what those prior art patents are. And they have significance. And there are at least three people involved.

There's you as an inventor, there's your patent lawyer who understands something about the technical area, and there's the examiner. And the issue is, if you willfully don't disclose prior art, it can be the basis for invalidating an otherwise good patent, because it's viewed as fraud on the Patent Office. So there are consequences.

So unlike the citations you might put in your technical paper-- I'm citing my professor because he's my PhD committee. I'm going to cite that person's textbook. It may not have anything directly relevant to the paper. There's more spurious citations than academic stuff.

So what we have here is the Tesla patent. And at the time it was issued in 2010, this was the prior art. These are the prior art patents that it cited. This is what it looked like in 2023.

Everything to the right of that patent were new patents citing the Tesla patent. So the idea of being able to figure out what the prior art is and be able to look at who's sighting you going forward can help you with a whole bunch of thinking about patent and business strategy.

Here's the Tesla patent portfolio back in 2018. And here's what it was in 2023. You can see how many patents they have on things. I'm going to come back to Tesla in a few minutes about their patent strategy.

But you can pretty much see when you look at these maps, what are people doing? A really good one is you got a core patent and you're filing extensions. And those will cite the core patent.

If you get a cluster of citations like that, that sort of tells you where they're going. The way these things are laid out, the ones in the bottom right are either patent applications that are published, don't cite prior art, or they're brand new patents that haven't had time to be cited when we look at an individual portfolio.

OK, so obtaining a patent, you want to think about what to patent, when, you're going to prepare an application, and then prosecute it. Prosecuting means simply negotiating with the Patent Office to get the claims on the patent.

So the important thing is to figure out what to patent. What large companies have done in order to encourage people to file patents is they give awards to inventors. So the inventors are there filing these things. And they end up with a whole bunch of patents.

And the question is, are these actually worthwhile or not? You don't really have the luxury of that as a new venture. So you want to figure out not what I could get a patent on, but what do I want to get a patent on? What's going to add value? And how will competitors use my technology?

And you want to figure out actually what you're doing against the prior art. So we worked with the National Science Foundation SBIR program. In phase II of that program, one of the crucial things of getting a phase II grant is that you have intellectual property.

So we worked with them to look at-- often when you have a technology, there are many places you could go with it. You know, your beachhead market, where do you want to go? And if you can actually visualize the patent world, it can help you make that decision.

So we made a map like the Tesla map using keyword searches for, say, an area, met with one of the SBIR grantees, and said, OK, well, there's a big thicket of patents up here at the top. And we looked. And we saw there were some companies there. And we looked at the titles without even having to read too deep.

And they said, ooh, that looks like a lot of what we're trying to do. But these other patents over here, there aren't many of them. And we could go there. So we think we might switch our whole commercialization effort from where we thought we were going to go to this other area.

So that was useful. We did the same kind of process a week or two later, same map with a lot of cluster at the top. And I said, well, this could be a patent thicket. You might not want to go there.

And they're looking at it. And they said, oh, we know these companies. And just looking at the title, we're going to have to dig deeper. But we think that might be exactly where we want to go. I said, well, why is that?

And they said, well, we think we've solved the problem that they're trying to solve and they haven't figured it out. Otherwise, they would have filed patent applications. And so in thinking about building something that someone would want to acquire as a strategy for a new venture, they said, we're going to look at this real carefully, and we may double down and go into that area and build a portfolio.

When to file? Well, again, you want to file before you lose rights. So that one-year period to public disclosure. Don't forget about the first inventor to file. And important, in time to have a patent to protect your product or services.

So a few years ago, I was negotiating with a large consumer products company for an exclusive license of something we had developed. They were excited about the concept. We had a bunch of patent applications that were in process. And I'll explain how we did that in a moment.

And as we were negotiating the deal, there was a whole section that said, well, what if these patents don't issue? We're going to cut the royalty or we're going to do this or that. And it was a whole-- it was a couple of pages. And just as we're in the middle of that big discussion, I got notification that one of our applications had issued as a patent in the US and then in two days later in China.

And I went back to them and I said, we can just rip up this whole section because we actually have issued patents now. And they felt really good about it because if they were going to license this, they want to spend a lot of their money building out, then go to market on it, et cetera, knowing that we had a protectable position.

Now, as I'm going to talk to you in a few minutes about, what the cost of patents are, they can be expensive. One of the things you can do, though, in order to get a placeholder, is what's called a provisional patent application.

Do you remember how I said that in the rest of the world, if you disclose before you file, you won't be able to get a patent? The concept of a provisional patent application was put in the law as something saying, well, this is really an application.

So if you file a provisional, that's going to count as filing. Other countries in the world are going to look at that and say, well, you did file. So it's a very quick application you can put in. It has to have a meaningful description of your invention. It does not have to include claims.

It establishes your filing date priority. It protects your idea for a year. And then you have to actually file a utility application. It's called a full application. It's fast and cheap. I think it's $64 for micro. That would be if you're a new venture, $64 filing fee.

Nothing happens at the Patent and Trademark Office. But you've established a date. When you go to file your full application, though, it has to have enough in the provisional for you to be able to say, my full application is going to fit into the provisional, what's described.

So let's say I discovered, and nobody else knew, that fruits and vegetables were important for human health. And I filed a provisional. And then in the course of the year, as I'm going out and talking and figuring my market, I realize, protein is important too. And I go to try to file a full application, including protein. That provisional isn't going to cover it.

In fact, a provisional can even be-- I've seen it where somebody's going to give a paper at a conference, let me just slap a cover page on it and file it. Now, patent lawyers will say you really ought to file and make it with the claims and everything. And yeah, if you had an unlimited amount of money, you could do that.

But as a startup, you don't have that. When we were developing the IPVision technology, it's a SaaS thing. We would have six-week development cycles. And before we deployed the code, we'd sit and we'd say, all right, what did we do in this cycle that we think is important? And should we file something?

What did we think about during the cycle that we did not implement that we think might be important that we should file on? And it was a pretty good discipline. And we'd file, $64, we'd file them.

And we had a series of these things. And then eventually 12 months later, of course, we had to decide whether we were going to pay the big bucks for it. But it's a good strategy for startups.

What's in a patent application? It's like a term paper. You've got the field of invention, usually, and then the background. What problem is there that you're solving? You do a little summary of what it is.

And then the core of it is the detailed description. Remember I said it's a trade-off. You get a patent if you disclose. Here's where you have to disclose what the invention is. And you have to describe the best mode of practicing it. So you can't say the best mode is this way, and then go off and do something else and expect to have it happen. And the claims are exactly is what your invention.

Now, the claims, the writing and interpretation of claims, that's a highly technical thing for patent lawyers. So you don't typically want to do those yourself. This is where you want to spend the money and get somebody who really knows the prior art and knows how to write stuff.

Here are some of the costs. Arrange for preparing an application $5,000 to $15,000. I once got a bill for $35,000 for an application. And I called up the law firm and I said, $35,000, what's going on?

Well, it turned out my co-founder was calling the patent lawyer all the time and saying, we should add this and we should do that. And he didn't tell me. And so the meter was just turning like this.

So I had to sit down the law for the company. Nobody talks to the patent lawyer without coming through me. And my co-founder was a former MIT professor. He's a brilliant guy. And I said, next time this happens, you're paying for all of the prosecution costs on it.

The filing fees are fairly low for a micro, which would be what you would be, $64. The prosecution costs-- it's like a tennis match. You really can't decide whether this is going to be a two-hit rally or what.

They had the Australian Open the other day. It was 55 back and forths. So you put the application in. Typically the examiner rejects it. And that's a good sign, because if they accept it, you probably haven't tried to claim enough.

And so you respond to that and point that the prior art does not really matter in this case for that reason. Then it goes back, and then the examiner, and you go back and forth. And if that keeps going, your cost is going to go up, because typically the patent lawyers charge by the hour.

You can't really control that very well. Some large companies have tried to do fixed cost patent applications. And we've done some analysis that say, typically that doesn't get you anything near a good patent, because all they want to do for a fixed cost is get something allowed as a claim.

And if I go back to that discussion with the big consumer products company, if we hadn't got our patents issued at that time, I wasn't really worried, because the language said if we didn't get at least one claim and one patent allowed, well, I could craft the claim so small that it would be irrelevant and it would have met the requirements of that contract.

So it was kind of stupid on their part. They didn't really understand what they were doing. Foreign patent applications get expensive. Here are some of the costs. You can read them. When you go to national phase, which just means you've filed in the US and you're going around the world. That really can get expensive.

There was a general accounting office study back in the early 2000s that looked at the cost for a small entity to get and maintain a patent in the 10 major industrial countries of the world. And it ranged from $350,000 to $500,000 over the life of the patent, which is a big number.

By the way, if we're thinking about licensing it, part of our negotiation with an exclusive license would be that the licensee would pick up the patent costs. So if you can get something licensed before you have to start paying the big bucks, that's a reason to do that.

If it's expensive, what's another strategy you might do? Well, I call it disclosing. If you have something that you think is a fundamental invention, and you talk to your patent lawyer and they think you can get a really strong patent on it, then a strategy is to disclose the others.

Because what you don't want to do is put it out there and have some other people come and picket fence, it's called. They patent all of the key things that are needed to bring that thing as a commercial viability.

The Japanese were famous for this. So here's my vessel to hold a liquid. Let's say I have that patent. And you come along and say, well, maybe it needs a top, or you could come along and say, I'll patent a sleeve, or maybe a handle, or maybe even an insulating version of that.

And if you do that, I'm sort of stuck. I can't go to market with any of those things. You blocked me in. An example of that is this Ring patent. This little patent in the yellow there, that was a Ring patent. All the red patents are from SkyBell.

When you see a pattern like that of one company citing one patent of another company, it could very well be a picket fence. So what it means here is if you can get that strong patent on the cup, the vessel to hold a liquid, you could disclose in the patent filing or elsewhere other things, but not actually claim it.

I've got a vessel to hold a liquid. It's wonderful. It are a lot of things you could do with it. You could put a top on it. You could put a handle on it. You could put an insulation sleeve for hot or cold. You can do all of that.

And having done that, that becomes prior art disclosed for other people. So somebody else can't come along and say, I want to patent the sleeve, because it's already been disclosed. It's cheap, but you want to make sure-- it's a cheap strategy, but you want to make sure that actually your core patent is going to be strong.

Now back to Tesla. You saw all the patents Tesla had. And Elon Musk's is pro-innovation. So back in 2014 they said, look, we're going to make a bunch of our patents available. We're going to license them for free to people, because we believe in innovation.

And everyone went yay. Well, what were those patents? They were things around chargers and other kinds of things. He had patented a bunch of things that were needed in order to make the complete ecosystem for electric vehicles. He's interested in selling electric vehicles.

Henry Ford was interested in selling cars. In Henry Ford's case, he didn't need to drill for oil, refine it into gas, build gas stations, build roads. Other people could do it.

In Tesla's case, if he could control through license what people did, but he could enable others to become entrepreneurs and build out the infrastructure, it would help his strategy. Because in the old days, the strategy for patents was patent what you invent and make sure you don't infringe.

If you think more broadly, even a nonprofit could patent something to make sure some other people wouldn't do things to prevent-- if the nonprofit's goal was to get this out into the marketplace, like Amy Smith's incubator I talked about the other day, then you could at least use that as a control if somebody tries to do something that you don't think is in the public interest. Make sense? Think a little bit broader.

So you should think about goal-oriented IP. What it is, you have a core technology. Do you have a product that if you put it out there, there's a risk that people could reverse engineer it? In which case, you might want to patent it.

If that product has a short time-frame, is it worth getting the cost of it, if it's going to be leapfrogged in two or three years? Is your business model to manufacture and sell? That's one thing. What if you're going to license it?

Well, if you're going to license the technology, you better have the IP protection, because your licensee is going to invest money in commercializing it. And they want to make sure that it's protected. So you would really want an IP strategy if you were licensing.

Now, there may be other non-IP bars to entry that might protect you, if you have to get FDA approval or other regulatory. And if you're thinking that your ultimate thing is you're going to be acquired, again, you want to have something that's valuable. And you might want to build up a portfolio of IP so that the person acquiring you sees that extra value.

All right, so practical checklists for you, employees. Make sure you get an invention disclosure and assignment agreement. Because as we know, the inventor owns if you don't get that.

Same with copyright. If you're using consultants, make sure you have a work for hire agreement which specifically says you, the consultant, are going to do x for me under a work for hire and I'll get to own it.

You want to have non-disclosure agreements where appropriate. Now, typically venture capital investors will not sign non-disclosure agreements. And the reason they state is, we get a lot of people coming in with similar technologies. And if we don't fund you but we fund someone else, we don't want to have anybody claiming we violated an agreement.

So again, don't disclose the secret sauce until the absolute last moment. You want to avoid infringement. You want to make sure you have freedom to operate. Am I going to infringe somebody else's patent if I bring this thing to market?

Understand the patent landscape, not only in one time, but over time. So to see the forest site, you can update those maps weekly or monthly and keep an idea of what competitors are doing. And you want to preserve your patent rights. File provisional applications.

By the way, there was a real culture thing. We were dealing with this large consumer products company. And we talked to their patent people and said, in our collaboration, we're going to be filing provisional applications. And they said, well, we don't really do that. Why not? Well, they're too hard to track.

And we said, listen, guys, Silicon Valley is doing this all the time. You're going to get hammered if you don't figure out how to keep track of this. So the big companies were not thinking in this way.

You want to make sure you file timely the patent application. And you want to make sure you're not going to be picket fenced, if appropriate. Now, how to deal with lawyers. They're wonderful creatures. I used to be one.

You're purchasing legal expertise usually by the hour. So already I've been here about an hour. The bill's going to be horrendous for you guys, I got to tell you. So you want a disciplined approach in dealing with lawyers.

If you come in and dump a notebook from your lab and say, write me a patent, it's going to take a long time. Or if you're like my co-founder and playing ping pong back and forth. So you want to understand what it is you're trying to do.

You want to make sure the attorney's kept informed. You want to show the invention disclosures, clear agreement on fees, and don't wait until the last moment. If you come up on the one-year deadline and call the attorney tomorrow and say I got to get this filed Monday, what do you think the bill's going to be, versus we're going to have to have this on file a month from now?

Leverage your technical expertise. Read some other patents in your area. You can do a first draft of everything. After all, you're describing what your invention is. Let the patent lawyer do the claims.

But the time you spend doing that and reading other people's patents is time you don't have to pay the lawyers for. And then you can read my ten commandments of dealing with lawyers, which is in the course materials about how to streamline your interactions.

The question came up the other night about licensing from universities. So I thought I would give you a rush through that. As I promised you, I'm overloading you with information. I think some of it's sinking in. Some people are looking like, I need a break. But let's talk about licensing.

Before the Bayh-Dole Act back in 1980, if the federal government funded research in a university, the federal government owned the resulting IP. It was managed out of Washington. It was only licensed non-exclusively.

So think about it. If you're going to build a business, you'd like to have an exclusive license and not against a bunch of competitors. And so the result was, few patents were commercialized. Only about 5% of patents were commercially licensed.

So Bayh-Dole came along and said, wait a second, guys, we should give the ownership of this IP that we the government pay for. Give it to the universities. They're closer to the inventors. And let them have the right to license it and keep the benefits from the license.

Oh, and by the way, they can license it exclusively. So they did. And this is what Bayh-Dole requires of universities. They have to retain ownership of innovations. They have to file the inventions patents. They have to give licensing preferences to small businesses.

They do provide the government with a royalty-free license. Rarely an issue. They have to develop programs to commercialize this. And they have to share royalties with the inventors. As a result, most of the research universities came up with technology licensing offices to do this.

The one at MIT is called the Technology Licensing Office. Interestingly enough, MIT historically in my experience is the easiest one to deal with because of the way they're structured and what their goals are. If you deal with other universities, their primary goal is getting revenue.

MIT says, look, we want to make sure this stuff gets out there, and only secondarily do we care about the royalties and what we can get for it. That also makes it organizationally easier to report up the chain, to saying we're doing it. But that's the mission of the TLO.

What is the ownership policy at MIT? I haven't vetted this recently. I don't think it's changed fundamentally. But go to the Technology Licensing Office site, which is tlo.mit.edu. MIT owns the patent if it's significant use of MIT facilities or MIT administered funds were used, say, for research.

They never assign ownership of the IP. They only license it. And they do guarantee sponsors of the research the first rights to the invention, so first right to license. You heard Ali last night saying she did her stuff as an undergraduate, so that was a good thing.

But she also went to the Technology Licensing office and said, can you just give me something that says MIT doesn't have ownership in this? And so there were no sponsor rights in what she was doing. She didn't use significant MIT facilities, didn't use funds, and didn't use MIT's facilities to reduce the practice.

That last one is interesting. The reason Kendall Square exists in large part is you have a technology in the lab, like what was it, Louis's last night? He's going to get a license. He's not going to do the work at MIT.

He's going to go across the street to a commercial building. And maybe Bob Langer will come over on his consulting day or whatever, but they're going to build their stuff outside of the University. And that's the whole Kendall Square thing.

You could voluntarily, if you convince the TLO to do it, say, I want to assign my invention that you otherwise don't own. And if they accept it, then you'll just be like the same manner as other MIT inventions, including royalty-sharing agreements with the inventors.

Now, as a startup, you've got an interesting thing. You're trying to figure out, what market am I going to go to? Where's my customer? You're going to explore that. You're going to try to raise money.

Meanwhile, you've got this IP that you need to get out of MIT. If you sneak it out the back door, the investors are going to figure it out. So what do you do? Well, one thing is to get an option.

Go to the TLO and say, look, I would like an option to obtain a license on this thing. And here's some of the terms. I haven't checked this recently, but it's a modest upfront fee. It allows time for you to go out and test the market and go talk to investors.

So the idea with investors is, hey, here's my technology. Here's our proof of concept. With these customers, we need this much money. And oh, by the way, we have an option to acquire a license to this technology. All we need is your money and we're ready to start rolling. It's a pretty good way to work.

So what are typical license financial terms? Again, I haven't vetted this currently, but it'll give you some idea. In the case of where the university doesn't take equity, the issue fees-- that is, the license issue fees-- could run $50,000 to $150,000.

You'll have to pay a license maintenance fee, which can be anywhere to 50% of expected running royalties. You have to diligently try to take the thing to market. You can't just put it on the shelf. They want to make sure it gets out there.

Royalty is a percentage of sales, anywhere from 3% to 5%. I'm going to show you some more detail on that in a moment. You have to pick up the patent costs, depending on what they are. And you're not required to sponsor any research.

If you say, look, I want to-- and one of the big things that MIT did was realize that they were licensing this all to big companies, and that it was the smaller companies that were the more innovative companies. So they should think about, how do we license smaller companies?

And the idea is, well, we could take some equity. And that's opened up a whole bunch of what's going on. The terms are basically the same, except the royalty is less and MIT would get an equity. Typically a single-digit ownership, which remains fixed through the first round of financing.

Meaning if, let's say, the MIT got 5% ownership, and now an investor comes in and invests and gets 20% of the company, MIT still has 5% of the company. They're not diluted through that first round.

Thereafter, they're proportionally diluted with everyone else. And we'll talk about anti-dilution provisions a little bit later in the presentation if I have time. And there will be future participation rights.

Here are some typical royalties for university patents. These are a few years old. You can go to the Association of Technology Managers-- AUTM it's called. And these are typical ranges of royalties back when I looked at this a few years ago. You can go validate it.

OK, timeline. We're running out of time. But legal entity, if you don't do anything, you could very well have a general partnership. It's one or more persons engaging in business for profit.

And so what does that mean? You don't need a written agreement. What it does mean is you have joint and several liability. So if anything goes wrong, I can sue either one of you or both of you.

The ownership, if you don't set it forth in an agreement, is based on the amount of money invested. It doesn't work very well for a founder, because the founder isn't putting in much relative to the investor. And investors aren't going to want to come in because they don't want the personal liability.

So what do you want to do? Well, typically you'll want to do probably a corporation. And if you're a company that's going to likely raise a bunch of money over time if you need to in order to be successful, probably Delaware.

Delaware has a more defined corporate law. More cases, it's more certain. And you should incorporate sooner than later to avoid that personal liability, to avoid liability for a partner, minimize personal taxes. We're going to talk about that in a moment. There's a YouTube video that I did on all of this in more detail.

If you do get a corporate thing, you want to make sure you observe the formalities. Do things in the corporate name, maintain separate records. Pick a name. I talked about DiVA the other night.

There's tax considerations. A corporation is a person-- not a warm, fuzzy person, but it's a person. It can be taxed. And if you don't do anything, it's taxed under Subchapter C, which means the corporation is taxed and anything that goes to the shareholders is taxed-- two layers of tax.

A way to avoid that is to elect to be a Subchapter S, which is a pass through, meaning there's no tax at the corporate level. The owners of the corporation have to pick up any taxes on their own tax returns.

You have to qualify for it. You have to have fewer than 100 shareholders. You can only have one class of stock. You have to file within, I think, three months of incorporation. You can't flip back and forth easily.

Some stockholders will not qualify for S. Mainly it's human beings, some trusts. So if a venture capital firm comes in, it's going to blow your Subchapter S status. So the question is, why do we care?

Look, hey, Joe, I'm going to run losses for a few years. I'm going to take this money. I'm going to do development. I'm going to be losses. I'm not paying taxes. Well, it comes when the exit occurs. Many acquisitions, especially smaller acquisitions, are done of assets.

You don't buy the stock, because if you buy the stock, you get everything that's associated with that. If you come in and buy just the assets, assume certain liabilities. So in that case, the corporation, if it sells assets, is going to have a gain on those assets taxed at the corporate level, if it's a C corp. If it's an S corp, no tax at the corporate level, pass through to the shareholders.

A little example here, it'd be like a 13% difference in tax. The DiVA people that I talked about the other day said, look, we're not going to be able to do anything unless we take venture capital. So I'm not going to worry about Sub S. I said, humor me. Just do it. And as I explain, they got acquired in two years. They saved about $2 million in taxes just because they filed as Sub S.

All right. This is a really important one. If you're falling asleep, wake up. This is a big trap. It's called Section 83 of the Internal Revenue Code. And it says the following. If you receive property in connection with providing services, you have ordinary income, which can be taxed federally to 37% or whatever, equal to the fair market value of the property you receive minus what you paid for it.

You with me so far? How does it apply to you? Well, suppose I give you $1 million for 50% ownership in your venture. And I say, let's set up the company. What's your 50% worth? Anybody?

I'm going to give you a million for half the company. Well, you could say there's a million dollars in cash, so 50% of the company must be 50% of the cash. So it could be $500,000.

OK, let's try that. Your shares are worth $500,000. What'd you pay for them? You have ordinary income of $500,000 and a tax rate of 40%. You owe $200,000. I'm sure you have that in your back pocket.

But wait, it could get even worse. Why would I pay $1 million for 50% of the company if the other half wasn't worth a million? Now you owe $400,000. Oops. But wait, it's even worse than that. When do you measure the income?

Well, typically stock is vested over time. If I'm going to give you $1 million for the company and you're going to get stock, how do I know you're not going to take off and run? So you can have that 50% of stock, but it's going to vest over time.

So if it vests over time, we measure the amount of income when the stock vests. So let's make it simple. Let's say it vests in two years, three years. I'll give you the actual numbers later.

At the time we start, your idea is a dime a dozen. When it vests two years from now and you've done a great job, it could be worth $100 a share. There was a case in California where they brought in a CFO finally, after a couple rounds of venture capital. And they gave him some stock.

He said, here's my 83(b) election. And they said, what's an 83(b) election? And they realized they had a whole bunch of stock issued to employees with vesting. It was a ticking time bomb. The company was going great.

Well, the accounting firm and the law firm all got sued and everything, because nobody had figured out and told people about 83. So you have to do an 83(b) election. If you do it, it says, I want to measure the income now. And you have to file it within 30 days of getting the stock.

So how do you avoid this trap? Well, the first thing is, you separate in time when you get the stock from when the investment comes in. So if you show up on my-- typically I'd have people come in and say, we got a term sheet. Let's incorporate.

Well, the term sheet is for $1 million. And you gave me the term sheet on Friday. We're going to incorporate, if I rush, Friday, or maybe Monday. So what happened between-- how do I say yours isn't worth $1 million?

Well, if you incorporated four months ago, lots of stuff happens. And at the time you incorporated, it was an issued stock. It was worth a penny a share. And you didn't get stock. You got stock in connection with providing services back then, not at the time someone put money in.

Question is, why does stock not get issued in time? Oh, well, we're too busy. We're not sure who gets what. I showed you this diagram the other day of the dynamics of figuring out how to split up stock.

So the problem is it can get tricky. But you don't want to get caught in that trap. So again, if you incorporate early, separate in time when you get your stock from an event that values it and cash. Investment certainly values it. Then you have an argument. And then file the 83(b) election.

OK, we're running into some time issues here. A bunch of questions about relationships up front. The founders memo in the materials talks about all of that. That's a memo I put together after meeting with three teams from MIT in one week, answering the same questions over and over.

So I wrote this memo and said, before you come in, read this and discuss it among yourselves. So when we get here, we can actually make some decisions, as opposed to having me spend two hours explaining to you what you have to go back and think about.

Founder equity, the amount of equity and who gets it is about culture and negotiated. Kenan Systems is a famous example. Kenan kept all of his stock. His company was acquired for $1 billion. He owned it all. He paid his employees quite well. And when they got acquired, he gave them all a bunch of bonuses. So that was their culture.

When thinking about the amount of equity, think about the value of past contributions and the value of what people are expected to do over what period of time. Think about ownership of IP, because you're going to want to put the IP in the company. Investors are going to want that, so that has some value.

Sacrifice and commitment. One example I saw was a company that spun out of Aero and Astro with a famous professor and one of his postdocs. And they came in and said, we don't know quite how to split up the stock.

I said, well, why don't you each go and write down what you think you're contributing and what you think you're giving up? And so the professor went and said, well, I'm well-known. So that attracts money.

Under MIT policy, I can consult one day a week. I'll devote that one day to this company. Instead of getting paid the money, I could get paid by Boeing or whatever. And a couple of other things.

The postdoc said, I could go get a job at a company. Here's what the pay is. I'm going to potentially, if I do this company, give up an academic career. You can understand, professor, what that is. And so they sat down, and each of them describing what it is, they were able to come to some understanding about what was fair, where at least they understood what the other side was talking about.

You should assume that everyone's going to figure out who owns what. So have a reason for what you're doing. Who gets the pie and how big are the slices? Well, typically, an equity compensation pool would be like an option or restricted stock. And typically the amount is for the next two to three years. And it's tied to your headcount plan.

If we get money in, we're going to hire these people. In my experience, when you have venture capital, first outside round, anywhere from 12% to 18% is reserved for the equity compensation, typically. It'll be at the lower end of that if you have more senior people already on board, it'd be on the higher end if you need to hire or bring in people that are more experienced.

People that can take place in the plan include key employees, directors, consultants. You can go look at and see what people typically get paid and the like. And again, there's a YouTube video going into more detail on that.

This is some example of ownership that you might expect after two rounds of financing, just based on some historical stuff. There's a slide, when we get to the financial projections, that allow you to calculate the equity dilution.

And given the time, I am going to skip the rest of this. You'll see the slides. I'm going to do a separate recording on it. It talks about types of equity compensation and how to use it.

We'll talk about instruments that are used when you do financing. And as I explained, I'm cramming a lot into a short period of time. And so in the interest of our panel that's here, I'm going to call it quits at this point.