**JOE HADZIMA:** OK. The second part of tonight is going to deal with legal issues. And the first thing I have to caution you on is-- whoops, what happened. I take that back. I didn't start at the beginning. This is background for education only and it's not legal advice. Have to say that.

One of the things is that law stuff is very fact specific. So anything that I tell you here now could change based on the facts. And the law could change too. What I'm going to do is go through an awful lot of slides covering a whole bunch of areas of law related to startups. And I put on a website-- the Deck. You can get that now if you want.

What I'd like you to do is I'm going to try to point out the big issues. And at the end of the day, it's more like an issue spotting thing. Will you recognize things as you encounter them so that you have a framework to have a discussion with your legal adviser, with your team, et cetera.

So we're going to go to a pretty good clip. I'll try to take questions but I reserve the right to sort of push through.

So it's about legal issues. I'll see if I get this thing working. Sorry.

First of all, do we have any lawyers in the audience? Uh-oh. One lawyer. OK. All right.

[INAUDIBLE] came up with this great idea that I did last year-- is to take the life cycle of the business and to look at it through various sets of layers here. Starting with intellectual property, legal entity, people, and financing. And across from pre- idea stage all the way through financing. So we're going to walk through that.

And the first stage is going to be the intellectual property stage. And it's the idea part. And the question is who owns the IP for the venture. And then the pre- outside financing is, how do you protect that. So that's the theme for this part.

Now how do we relate to a business plan. And this is Fiona Murray's Four Key Ideas for

Startups The first is controlling the knowledge underlying an invention. If that's important to your business success, that's one of the keys to startup. The second is secrecy. Maybe nobody else knows exactly how you do what you do. The third is speed. Even with that other stuff you need to move quickly. And that could be a real key advantage-- an idea.

And the fourth thing-- in thinking about intellectual property-- is there a way you could lock in customers. The way you go about dealing with your intellectual property.

And then how can that help you in your business plan. Well first of all, IP is a valuable asset and you can use it to raise capital. One of the issues with a lot of IP is the investors don't really understand what it is. But they think it's important. And so if you don't have some, they're going to be questioning, why aren't you doing something there. So it's really a combination of, is this important to you and have you thought about it.

Now there is correlation between IP and success. I did a study-- it was published in the Intellectual Asset Management publication-- in which we run these analyzes on venture backed companies. We run about 9,000 companies through the set of metrics. And we took five top funds. Kleiner Perkins, New Enterprise, Domain-- and we looked at patents and we said, if we were to try to figure out which companies had IP and how good was their IP and what was there success rates.

We look at the portfolios and said, well we know some companies have been acquired or they've gone public. Those are winners. And some companies are out of business. They failed. And then a bunch of the other companies-- we don't know where they are from a thing. And what we did is we looked at our rankings based on analyzing IP.

And it turned out to 86% of the winners scored high in their patent strategy. Which is sort of interesting when you think. The Kleiner Perkins success rate is one out of three. That is one out of every three investments that they make turns out to be a success. And they've got the best track record out there. So IP can really correlate with success.

The other thing people look at is you can establish that you are a good manager of your technology. And that can help you in on your business plan.

Now I'm going to run two different types of IP protection, starting with none. And then trademark, copyright, trade secret, patent, and combination.

Now trademark and copyright-- I'll get into more detail-- but basically these are things that can enhance your value. But they don't necessarily block others from doing what you're doing. Whereas trade secret can prevent others. If they don't know how you do it, they can't do it. And then patent is sort of a combination of both. Because in order to get a patent, as you'll see, you have to actually disclose what you're doing. So you're telling people the secret sauce but you get some rights in return. And then in some cases you get combinations of protections. Like software can be protected by copyright and by patent.

So trademarks, what are these things. Well basically a trademark is-- it can be a name, a symbol, a sound. Harley Davidson actually trademarked the sound of the vroom vroom. Color pink for insulation is Owens Corning. And what it is-- it's something that tells a consumer that you're the source of that good or service.

So if I say Mercedes-Benz, you have an image of what it is. So it connects the customer with a particular source. And it can be all sorts of things. It can be a house mark, which would be IBM or Virtual Inc, which is sort of the company names. It can be a product mark. Like ThinkPad used to be IBM. Now a Lenovo product. And Mimio was the virtual ink one.

The rights you get from trademark arise through use. And if you register it you get a whole bunch of benefits. And it's not very expensive process to do it. You should use a fanciful name. So who would have thought Apple for a computer. That's a strong mark. Don't pick something that's merely descriptive, like storage technology or analog devices as a mark.

And for the business plan, if you're putting it together, you can actually check on the availability of a mark by going to the USPTO and you can search for a mark name. Any questions on that so far?

OK, so the next one is copyright. So copyright is basically the right to prevent others from making copies of what you do. And it rises just from creating a work. So if I write a letter to my mother, I have a copyright in that. Federal registration is a plus in terms of the ability to enforce that. It protects the expression, not the function. So I can actually copyright my exact code in software. But I can't, through copyright, prevent somebody else from looking at the code and writing equivalent kind of things, as long as they are not exactly copying it.

Now for a business plan, the key thing with copyright that people trip over is who owns it. The owner of a copyright is the author of the work, be it software, a document, or whatever. It's the

author. Now unless that author is an employee and is generating that in the course of employment.

So if you go and hire an independent contractor to write code for you, don't own it, even though you paid for it. And so you've got to make sure you have an assignment of ownership of that work to you. Or when the investors come in and they do their due diligence, they're going to say, you don't actually own it.

I had a case back in my law days where someone paid over a half million dollars for code and couldn't actually get ownership of it because he hadn't protected it. And I also mentioned here, look at open source as an issue. Where you're using open source, make sure you're complying with the license for open source.

Because investors, when they come in-- you do all this work, you do your pitch. They send in the troops to look you over then they find these landmines you've planted there that you could have avoided. So keep that in mind.

Now trade secret is what it says. It's a secret it's something that gives you, hopefully, an unfair competitive advantage that nobody else knows how to do. And the most famous one is the formula for Coca Cola. Which, I don't know whether chemically you could figure it out-- apparently nobody has. But that's an example. It's been a secret for a long time.

I should back up. A copyright is effectively a long time. It's like 75 years. Trademark is indefinite as long as you keep renewing it. Trade secret is indefinite until it's finally out there in the world. So you protect trade secrets through non-disclosure agreements, if you're going to actually have to describe it, or you just don't tell people about it.

I think I'll just leave it at that point

The sort of big gorilla in the IP spaces is patents. Because they have much stronger rights that you get. They're more expensive to get, but they're stronger rights. So a patent is really a limited time monopoly. And we don't really like monopolies in the US. We have antitrust laws. But in this case-- societal benefit, it goes right back to the Constitution. It says, look, we're going to get ahead as a society if an inventor will tell us how he did it. And in exchange, we'll give the inventor a limited time monopoly to prevent others from doing something.

It has to be applied for. In the US, that's with the patent office. These patents are country by

country. In fact, most of these IP rights are country by country.

Now, what do you get. Well, it's very much like real estate. The fundamental right-- and we'll go into a little more detail in a moment-- is the right to prevent people from trespassing on your invention. So if you own a piece of real estate, your fundamental right is, if I own it and you walk on my property, I can kick you off. Call the police, get off my property. And that's essentially what a patent does.

The way it does that is you could prevent others from making, using, selling, importing, and distributing your invention. So you can't take something that's patented in the US, take it to a third, a second, another country, make it and bring it back into the US. That would be an infringement.

Now the ownership of a patent is not necessarily the right to use it. That's a hard one to think about. What does that mean. Well, think about real estate. If my fundamental right is, I can keep you from walking on my land, does that mean I can actually use my land. Well, maybe not. Suppose I have to walk across your land to get to my land. I might not actually be able to use my land but I can certainly keep you off of it.

And so that's the analogy. Some people think that it's a right to use. It's really a right to exclude. And the claims in the patent are like the fence around the property. So those to find what the legal property is that you can keep people out of. And the duration is 20 years from the date of filing under the new rules.

Now what do you have to do to get a patent. It has to be something new, novel. And to get it, you have to show the examiner. You make a filing with the patent office and you have to tell the examiner how yours is different from what else is out there. Let's call prior art. So you have to cite prior art. So it has to be useful, also. That's not really an issue for most patents. There's some pretty un-useful things that have been patented out there.

It has to be patentable subject matter, which is this whole thing we're seeing now with business method patents that I won't go into any detail on. And it can't previously have been sold or publicly described. In the US you have a one year window from the time you publicly describe your invention or you put on the market for sale. You have one year in which you get an application on file. And if you don't, you won't be able to get a patent at all.

Now the public description has to be an enabling description. So it has to be something that

actually explains it. So if I stood here and said, I've got this invention for anti-gravity boots, I haven't told you anything about how it's done. So it has to be enabling.

Now the other requirement is that what you're trying to patent has to be not obvious to one of ordinary skill in the art. Now the word is ordinary skill in the art. I had a MIT professor who decided, well, this was sort of-- anybody could have figured this out. Because he was used to dealing at MIT professor level. And so I said, I'm not sure. You better go check with a patent lawyer. And sure enough, it was not something anyone with an ordinary skill would have been able to figure out.

Examples of overcoming that part is that the prior art teaches against it. Other people say it can't be done. And you've shown it or its commercial success. Bob Langer does a great story about some of his early patents, where he came in and showed the examiner. Look, if it was so obvious, how come nobody else did it. Nobody else. And here are some papers that said it can't be done. And that's how he overcame his original set of issues.

I hear a question? OK. In the back, yes.

**AUDIENCE:** Not previously sold. Does that mean not previously sold by anyone else? Or can you not sell it until you have the patent?

**JOE HADZIMA:** Let me go back. I said it was one year in the US. I should also mention in the rest of the world, if you disclose or offer for sale before you file, you won't be able to get a patent in any other country.

**AUDIENCE:** One year is from the first time you--

**JOE HADZIMA:** Either publicly disclose or hold out for sale. Yeah. And there are a lot of nuances on the hold out for sale. The purpose of going through this is I want you know sort of what the general issues are. And so you'll think about it. Oh, maybe we ought to get that-- if we want to have a patent, maybe we ought to go talk to someone before we take it to a demo day and blow our chances.

**AUDIENCE:** So does public disclosure include things like telling your peers in a lab or telling students in a class? And also, if you [INAUDIBLE] use an object in [INAUDIBLE] without revealing how one goes from input to output-- is that a disclosure?

**JOE HADZIMA:** All right. So the question is, is a public disclosure if you talk to your lab mates or you do it in the confines of an academic setting. Sort of a closed kind of setting. And in general, yes, but you want to be very careful about that. It's one of those facts and circumstances type things. There is an exception to the holding out for sale for experimental use of something.

But again, the point here is you don't want to rely on these after the fact. You want to, if you're planning some activities where you think it's really important about a patent, make sure you know what the exact rule is at that time. Because it could change next week with a court case. These are just red flag type things.

**AUDIENCE:** What about the second half? Where if you're demoing something but you give no indication of what it's worth [INAUDIBLE].

**JOE HADZIMA:** So the question is, if you're demoing something and you don't explain how it works, is that a disclosure. It's actually been held that way in some cases. Where you actually couldn't see the actual device. So again, my point is, think about ahead of time and with the given facts, make sure you get some good advice before you go off and do it and then wish you had thought about it ahead of time.

OK. So let me keep moving. Oops, let's see.

Same issue from a business plan viewpoint. Do you actually own the technology. So a patent issues in the name of an inventor. And a company only gets it if the inventor assigns it. So if you're a technical person, you go work for a company, you probably end up signing an invention disclosure agreement and an assignment. So if you invent something in the course of your work, you agree the employer owns it. And if you're a startup and you hire people, you want to have something along those lines also.

You could in-license from the university. I'll tell you a little bit about MIT and how it works there. And did you let it go into the public domain. In other words, did you screw up these one year rules.

OK. Now obtaining a patent involves sort of four steps. In Determining what to patent. Determining when to file. You got to prepare the applications. And then you've got to prosecute it, which means you negotiate with the Patent Office about getting a patent. And that can take several years.

Determining what the patent really is more about not what can I get a patent on. Its what's useful. Because patents are pretty expensive. And you probably don't have enough money to patent everything you actually invent. And when you say, what do I want to get a patent on, you say, well, what value does it add. Remember we talked about we want to create value-- that's part of the mission here. If I patent this, is it valuable. Does it create commercial value. Does it prevent competitors from using it.

And in determining whether it has commercial value or not, or whether you can easily get a patent on it, you want to compare against the prior art. So this is where I get to do a little pitch for the company that I founded called IP Vision.

We were doing early stage technology commercialization out of MIT. And the problem we had doing the same kind of things we're talking about in class-- market, time to market, what's the strategy-- is we always had a problem figuring out what's the intellectual property. And the only way we could really do it was try to read a ton of patents or send it out to a law firm. And we get back a real thick report. It was perfectly accurate, but not very helpful.

So we invented our own way to map out the IP space. And this is an example of our landing page. The free version is at see-the-forest.com, with hyphens in-between there. There's a free version. And for people in the MIT community, we give free upgrades to premium while you're working on your plans and stuff. So check it out and I'll show you an example of what it looks like.

This is Virtual Inks, one of its key first patents. And this is a patent map. The horizontal axis is time. The patent is here. Each of these boxes is aligned in time, with the left edge being the issue date and the tail being the filing date. And this is a single patent landscape map when they started off. And these are the citations. So this patent cited all these other patents as prior art in the course of the examination.

So by looking at these maps you can see who's in the space and see what's going on. You can right click on the system on any of the boxes and get the underlying information. The statistics boxes on the map shows you who's on the map so you can see quickly who's in the space. And this is what this patent looked like several years later.

So when it issued, of course nobody else was citing it because these are not publicly disclosed back in this day-- until it was issued. Over time, other things started to cite Yonald's patent.

So it's an example of something where you can quickly look at it and check it out. And if you have any questions, let me know on that. This is what the Virtual Ink US portfolio looked like it when it had 12 patents. And you can see these are some of patents. And you can start to see other companies citing. So these are potential partners, customers. It can also help you, as you try to figure out as you look at a space, where do you want to take the commercialization plan. So check it out let me know if you have any questions.

OK, so the question is when to file. Before you lose rights. So that's the whole thing about if you do a public disclosure and you want to get a patent in France or Germany or something, and you haven't filed already somewhere, you're going to lose that. And then you want to take into account we have new domain now called the America Invents Act. Before, it used to be in the US, that the first to invent won in a dispute between inventors.

Under the new rules that came into effect this year, it's the first to file. Which is actually a tougher one for startups because you'd like to not encounter all of that cost for filing until you actually get an idea that it's a good idea. But you could lose the race to the Patent Office. So it makes a little harder on startups these days.

A way to deal with the high cost of filings are things called Provisional Applications. Provisionals are very simple things. They don't even have to have claims. They just describe what the invention is. And I've even seen people going to give a paper at a talk slap a cover page on it and file it. And what it does is it establishes a filing date, which means for the rest of the world, you filed. And you now have one year from the date you made the provisional in order to decide whether you really want a patent on the thing as you've tested out the market.

These are pretty inexpensive. It's $130-- I checked the other day-- for small entities. And for micro entities, which all of you would be, it's $65 dollars.

Nothing happens at the PTO once it's filed. It's just a placeholder. And the only risk is that if you disclose something in the provisional and when you go to file the utility patent a year later, you include things that weren't in the provisional, you may have lost that. So you have to sort of think that through.

When we were developing the IP Vision site as a SAS platform, we were doing revs every four to six weeks. And for every release we'd sit down and say, what is it we did that might be of interest that we might want to patent. What did we think about doing but we didn't actually do

because it wasn't in the development plan.

We'd systematically do that and we'd file provisional patents. $100 a pop. And it kept holding our place until we were ready to figure out what we really wanted to patent and spend the extra money on.

Was there a question?

**AUDIENCE:** Yeah, quick question. You said that they slapped a coverage fee on it. [INAUDIBLE] That's then publicly in the books. So does that mean--

**JOE HADZIMA:** Oh sorry, provisionals are not published.

**AUDIENCE:** But weren't they going to present it at a conference, you said?

**JOE HADZIMA:** They may go disclose it.

**AUDIENCE:** Does that [INAUDIBLE] an international patent platform?

**JOE HADZIMA:** No, a provisional counts as a filing.

**AUDIENCE:** For international?

**JOE HADZIMA:** For international, yeah. That's the good part of the invention. Now a patent lawyer will say you're better off doing a whole application and get the claims and think it through. Well, there's a lot of things that would be good to do. It's just time and resources. So this is a reasonable approach to think about.

As I say, it's all fact dependent. If you have something that's really key and you really understand exactly what the invention is, it might be worth going directly to a full filing. But it's just a strategy. OK?

So what's in a patent. How many people that actually looked at a patent? Read one? Anyone have a patent? Couple. Good.

So it's sort of like a term paper in a sense. There's a part of it that says, describe to me what the invention is. And again, it's a societal trade off. You tell me your invention, I'll give you this limited time monopoly. So part of the usual set up is there's a field of invention, there's a background. You usually describe what's broken that you fixed. To show why yours is novel

and nobody else has done it. Non-obvious. Then you summarize the invention. Then you go into a detailed description.

And there's this technical thing saying you have to really explain what the best mode of practicing your invention is. Because again, the idea is if that knowledge gets in a society, everybody can build off of it and we all get better. And we give you the rights to exclude for the 20 year period. So you've got to really actually describe how it works. And then the claims are the key part.

Now from a cost viewpoint, I think everyone in the room is capable of writing everything about the patent and save a bunch of money, at least as a first draft. You want the patent lawyers. So the people that know how to craft the claims. The claims are the tricky part. If you ever have to enforce this stuff, it's the claims that really matter. So that's where you want to spend the legal money-- is on the claims. And if you just go in and drop your lab notebook on the patent lawyer's desk, you're paying by the hour for stuff that you probably are better off doing yourself and doing the first draft of what it is you're trying to do.

Cost of-- US, an application is about anywhere from $5,000 to $15,000 on average. I've actually ended up spending $30,000 because I didn't control the process. One of my co-founders kept calling the patent lawyer and throwing new things in without telling me. And then I get the bill. I thought I had the control on it. The filing fee is not that much.

I should mention that applications in the US are now published 18 months after they're filed. That is the official utility application, not the provisional. So when you actually file your full application, 18 months, they're published. And the only exception is if you say, I don't want to get a patent any place else in the world, then they will publish it in the US until it actually issues, if and when it issues.

Foreign applications are really expensive. There was a government accounting office study in the early 2000 era that looked at 10 countries and an invention by a relatively small entity. And they estimated it would cost somewhere between $300,000 and $500,000 to file and maintain a patent and in the 10 major countries. So you want to be a little bit thoughtful about this stuff.

Now I'm going to switch over to university licensing. And a little bit of history. The federal government sponsors a lot of research all over the country. And it used to be the ownership of that was the federal government and somebody in Washington trying to figure out what was

happening.

The Bayh-Dole Act came around in 1980 and it said, look, we're going to put licensing down at the university level where the research is done because they'll have a better idea of what's going on. And we're going to give them some rights and some obligations.

So the key point here-- you can look at it on the slide later-- is really putting it at the university level. There is some emphasis in the rules about licensing to small companies. It used to be the big companies, now the small companies. And there's a provision for royalties to inventors out of the process.

Now at MIT it's the Technology Licensing Office, known as the TLO. That is the place that administers this. Now the primary goal stated by the TLO is tech transfer. They want to get inventions out into the marketplace. And the secondary goal is to generate revenue. And there's the website for checking it out.

Now, the secondary goal-- a lot of universities seem to put the emphasis more on the revenue side and less on the tech transfer. So MIT is a little unique in this.

There's a question of who owns stuff. There's MIT IP Ownership Policy. You can check us out at the TLO. And essentially, it says, look, MIT is going to own the work that's done here by staff and researchers if it's under funded research. It will also own it if there's a significant use of MIT resources-- facilities. So if you're using the nuclear reactor. It doesn't mean that you're using Athena or stuff like that. But if you're using significant use, then MIT may claim ownership.

If you have questions about ownership, the TLO is pretty approachable. So you can go over and chat with them about it. And they often will waive or clarify rights to enable you to start your company. What you don't want to do is go down the path, get investors interested, and then have them, again, find out that maybe you don't actually have rights to the stuff. That's not a good place to be.

Now this place has got a lot of smart people doing a lot of interesting things. And not all of it falls under the sponsored research or significant use of facilities. So MIT actually has a policy that says we will voluntarily look at and maybe take on board inventions the people have. Even

if it wasn't under funded research. And what they'll do is so prosecute the patent around and engage in licensing. So that's opened up the number of things that the TLO does. And they're pretty open about it.

Now as a startup, what can you do. Licensing can be expensive. You're trying to put a plan together, you're trying to figure out your market, you want to secure the rights, and you need funding. So typically what happens is you'll get an option on the technology. We'll call it just technology broadly.

It's usually six months to a year. It's not that expensive. You'll have to assume some of the patent prosecution costs. And what it allows you to do-- that is, to know-- that when you take the idea out to the investor community, you actually can fulfill. You've got everything lined up. I've got rights to the patents. I've got my idea, I've got my team, I just need your money. And away you go.

Typical license terms. This is a couple years old, care of Steve Brown, who used to be at the TLO. The components of the license you'll find include issue fees. In other words, what does it cost to actually get the license directly. There's maintenance fees to continue to maintain the license. There's diligence. They don't want you to just sit on it.

And what I've done in the columns here is if you don't want to give up equity, what the typical terms are, and what the terms are with equity. Royalty as a percentage of sale. You see 3% to 5% with no equity. 2% to 4%, maybe with. Patent costs are the same, et cetera.

Now from equity side, one of the big innovations that MIT did is-- it used to be only big companies would come in and license. But we look here and all the entrepreneurial stuff going on. They said, well we want to figure out a way to encourage small companies. And so how do we do that. Well the equity was one way to do it. And we'll take equity in lieu of the cash fees.

Typically it's single digit percentage of equity that you give up. And that percentage is maintained undiluted, usually through the first major round of financing. And we'll talk about what dilution means when we get into terms here in a little bit.

These were typical royalties a few years ago for university patents. You'll see they're all over the place. Again, it's in the materials. You can check those out.

Now how do they have split things up. Just so you have an appreciation. If there is any return from a license, be it royalties or a company goes public and MIT sells the stock, 15% percent

comes off the top to pay for TLO operating expenses. Than they deduct the patent costs. And then after that, a third of it goes to the inventors. And then basically, with some other adjustments, the other two thirds are split between the department and MIT in general. So that's a university licensing.

Any questions on that? OK, really do approach the TLO. They're pretty responsive. Or they can be.

**AUDIENCE:** Can you kind of name some of the pitfalls of some [INAUDIBLE] something out of the lab, and not necessarily-- like when to sever ties with the research lab and make sure you have a really strong wall between the two and [INAUDIBLE]

**JOE HADZIMA:** Yeah there's a whole bunch of things. So the basic strategy is that if you're funded, you get your license, and you set up shop outside, and the people that are at MIT go across the street and do their work in the lab or whatever. Across the street, not on MIT campus. And that sort of works the same way if you're starting a company. That you try to separate the two.

Now it gets a little complex if you're under sponsored research and you're being funded in a lab. It can get a little complex. We had a situation a few years ago back when I was practicing. Where my client was a professor in the AI, artificial intelligence group, and one of his PhD students was split between the Media Lab and the AI group. And because of the way the Media Lab stuff worked, the professors inventions were somehow being claimed by the Media Lab. So there's some real technical stuff there.

But there are plenty of people who can help you out on that. And I just want to put a red flag up. Again, to think about it. In terms of whether you can actually own it, the TLO can be approachable on that.

OK, now I want to switch to the next topic, which is legal forms of doing business. How do you get organized. And again, these are sort of the red flag kind of things. I'm going to cut through. I do a whole couple of sessions at Sloan on this stuff. But here I'm going to try to give you the high level conclusions.

So in most cases for companies that are technology based companies that are going to need any kind of financing, the choice is a Delaware corporation. Delaware has a corporate law that's very flexible, predictable, and it has its separate court that hears specific cases surround stockholder rights. And so the default tends to be towards Delaware.

And the question is, when should you incorporate. Or should you incorporate. Basically, the corporation gives you limited liability as owners of the business. You can't say, look, I've got this idea. I'm going to set up a company, I'll transfer my invention to the company, and I won't have any personal liability. You're always liable for your own acts. The question here, from launching a company viewpoint, is are your investors going to be liable for your acts. So that's where corporate form protects the shareholders.

Now the question is when to incorporate. You should do it sooner than later to avoid personal liability based on your ownership and toward partnership liability. And there's a thing I'm going to go into called the Section 83. And that's a real catch for you if you don't work on it and incorporate early.

Now the next question is, all right, I got a corporate form, how is it taxed. And again, the default that I always recommend is to file what's called an S corporation election. So a regular corporation is taxed on its profit. And when that profit is handed out to the shareholders, it's taxed again. So there's two layers of tax.

A Subchapter S, if you qualify-- there's only one layer of tax. The corporation doesn't pay tax. But the attributes get passed through to the shareholders. You have to have fewer than 100 shareholders. One class of stock. And you can't have nonresident aliens as shareholders, which is an issue if you're a foreign student. And it has to be primarily human beings, except for certain types of trusts.

So as soon as a venture capital firm-- if you take the money-- invests, it'll destroy the Subchapter S status and it'll be taxed as a C. But it can really make a difference.

The first company that was taken out of the Media Lab was a company called DIVA, Digital Video Applications. And the founder said, if we don't ever get venture money, we'll never succeed. And I said, well let's do it with the S corporation. Well they never did raise venture money. They sold the company two years later for I think it was somewhere around $10 million. And they saved a million and a half or more having done that.

Let me move through here. Here's an example of the S corporation taxation. I'll just leave it in there. You can see the two layers of tax. And the net effect is, well why would you do this if most startups lose money. They're not going to be taxed. And the issue is it's when it gets acquired that you can succeed. And you can save 20 plus percent under current rates. You

can work the math from the slides that are online.

Now I want to switch to something that is actually an issue for you personally. And it can be a big thing. It's a very odd part of the Internal Revenue code called Section 83. And it says, if you receive property in connection with providing services- and here stock is property for this purpose-- then you have ordinary income. That's like you get when you get a paycheck, which can be taxed up to 35 plus percent under current rates. And the amount is the fair market value of the property that you get, minus what you paid. And that's what the income is that you pay tax on.

So here's an example. I like your idea. And I say, I'll tell you what, I'll give you a million dollars, we'll start a company, and how about 50-50. And you say, OK. For this purpose, you say 50-50. What happens is, let me ask you how much is your 50% of the company. I provide the capital, a million dollars, we each have 50% of the company, and you get the other 50%, how much is your side worth. Anybody?

**AUDIENCE:** What's the [INAUDIBLE]

**JOE HADZIMA:** I put the first million dollars in for half the company.

**AUDIENCE:** [INAUDIBLE]

**JOE HADZIMA:** Yeah, it could be a million or--

**AUDIENCE:** $750,000.

**JOE HADZIMA:** $750,000. Well you could say it's a million, because why would I pay a million for one half if the other half wasn't worth a million. On the other hand, once the million dollars goes in, and there's no real asset in there other than the million dollars, you sort of own half the million dollars. So let's just do the math. So the fair market value, if it was at $500,000, you pay zero, your ordinary income is $500,000 taxed at 35% percent or something. Not good.

And if it's a million, 40% would be $200,000 you owe. And if it's a million, you owe $400,000. Congratulations. Tax bill. So that's not a good result, right? So the question is, how do you avoid that.

Well the trick is to separate the time when you get your stock from the time the investment comes in. So if you come in to a lawyer's office on Friday with a term sheet and say, let's

incorporate, we're going to close next week, the question is, what happened between Friday and when you closed. Well maybe a patent issued or you got FDA approval or something.

So you stretch those further in time and you get your stock early then you don't fall into this trap. It's when you get your stock at the same time the investment comes in. So the mission here is to incorporate earlier and issue stock as soon as you can and make what's called an 83(b) election, which we won't go into fully here, but you have to do that within 30 days.

So the question is, why doesn't stock get issued in time. Even with startups. I see so many situations where the team is working, they're doing all the things that guys up here talked about. And the investment comes in and they may even have incorporated, but they haven't actually given the stock out. And I think it could be anything from too busy to nobody's quite sure who should get what. You heard John talk about everyone pulling their weight except one person.

What I do see in the case of technical startups is the issue between the technologists who maybe has the idea-- so think of the dynamics. We're starting a company. We've got to sort of prove out the technology with a prototype or something. And the technologist is working in the lab. Working really hard on it, long hours. And the business side people are waiting, maybe even keep their day job doing the planning. And there's sort of this dichotomy.

So if you think about it this way. If you say I have time across a horizontal axis and relative importance. And I said, where would you put the technology person on this chart at the beginning. How relatively important is the technology in a start up at the beginning. Well it's going to be high, because if it doesn't work you don't have anything. And where would you put the business guy.

**AUDIENCE:** [INAUDIBLE]

**JOE HADZIMA:** Well over time, technology is less important, right? Relatively speaking. And the business starts at the bottom, relatively speaking, and improves over time. And at some point, they're balanced off. Whether they cross or not isn't really important. The important thing is to realize you can have team dynamics where the technology people, who think it's their invention, they're doing all the work-- and then how do you end up splitting stock in a situation like that.

Well it's my technology, I don't want to give it. You guys aren't really doing it. And you get a lot of tension around that. But just simply realizing the dynamics of relative importance. And you

heard from the people here about needing a whole team to pull it off can at least put people in the same way of thinking about it. Does that make sense? OK.

Now what you heard from the have the team here tonight that people was the most important. And most companies fail because of people issues. So you got to sort out those relationships upfront. Now in a small company, the stockholders owe each other a fiduciary duty. Meaning you got a sort of treat everyone with a degree of fairness.

So you'll have a set of questions about who sits on the board. If you populate a board other than for legal, who owes what titles, what functional things. You want to talk about restrictions on stock transfers. Rights of first refusal, tag along rights, all of these terms here you can read about in the founders memo, which is in the resources part of the website.

This is a memo that years ago-- I had one week, as a relatively young lawyer, and I had three teams come in. Great startup teams from MIT. And with each team I spent four to five hours with them trying to walk them through the kind of things that you need to think about.

So at the end of the week I'm thinking, this is ridiculous. I went through the same set of exercises with these people. They don't want to pay me to do this. I don't want to spend all the time educating them. So I went home and I wrote the beginning or the Founder's Memo, which sort of sets out all of the kind of things to think about.

And what I would do after that is, I would say, if you're going to come in and meet with me, I want you all to read the founders memo and start talking about what philosophy you have and understand some of the issues. So we don't spend a lot of time educating you while the meter's running. And that worked very effectively. So the Founder's Memo-- it's not a fancy memo but it's been very helpful to people over the years they tell me.

So the question is how to founder's equity split. The Wasserman book is a good one to look out on different ways founders think about splitting. There's no one formula. There's a culture. I negotiated Kenan Systems. It was a very successful company sold for a billion dollars. It was owned by one person, Kenan Sahin. He paid all of his people good salaries. And that culture worked. It was a very successful company. He ended up giving $100 million to MIT, which was nice.

But it doesn't mean that you always have to spread equity around.

And part of this is from Charlie's slides. You're going to look at the value of past contributions and future contributions. Sacrifice commitment. Ownership of IP. People's internal or external market value. And internal equity.

There was a good team that was set up that went through a really disciplined exercise where there was at MIT professor and a post-doc. And they were trying to figure out how to split it up. So I said to each of them, well you write down what you think you're giving up to join the company. And we just have a discussion about it.

So the professor said, well, I've got a worldwide reputation. I'm allowed to consult one day a week. If I joined the company, I'm not going to be doing that. My consulting rate is x. And he had a bunch of things. The post-doc said, well, I'll be giving up my academic career. It would be very hard for me to go back. If I got a job in industry, I'd be making this much. I'm going to be spending full time on this. And it created a framework where they could have a discussion around how they were approaching it.

It was fairly successful. And that works often with MIT. People were sort of data driven.

The other thing about equity-- when you get beyond--

I'll mention it in a moment. We're going to switch over now to employees and outside contractors.

This is the slide from Charlie the other night. He included in here about how to think about equity with employees. One of the issues with employees is does stock motivate. Does it really motivate. If you've never actually been in a company and had an event occur where that piece of paper was enough money to buy a nice car or a down payment on a house or something-- it's just a piece of paper.

The first job I had out of MIT was with a spin-off company from Pugh-Roberts. Ed Roberts at Sloan School. We were in a triple decker house up on [? Leigh ?] Street. I was the third employee. We had the third floor because his other company was on the nice floors.

And so the first day I get there, I come sort of mid morning, it's time. I've got to go down, use the bathroom after all a coffee. So the bathroom was one of those half baths under the stairway under these triple decker houses. So I go down there, I open the door, and I look in.

And the entire wall this little half bath is papered with what looks like real stock certificates.

I mean first of all, I thought it was wallpaper. That's sort of a weird wallpaper. Then I looked. They're real stock certificates. So clearly they weren't worth a whole lot if they were wallpapering a bathroom. So to me it said two things. One is if you don't want to work for wallpaper, get back to work. And secondly, what is this stuff called stock.

So a lot of employees-- you shouldn't assume right away that equity motivates people. People don't understand it many cases. There was a story about Prime Computer and Bose, where they were recruiting an engineer. And they basically had the same cash salary. But one company was offering twice as much stock as the other-- number of shares. And what was not clear was that they had the same market value. One stock was worth twice as much per share as the other.

So the perception, if you're not used to dealing with stock, that people automatically understand how it works. You shouldn't assume. There is a market for labor if you're in certain industries-- you're going to need to give equity to bring in the good people. But you really have to think about that. Don't just go pattern thinking about. Oh everyone gets stock because that's the way everyone does things. You have to think about that.

So the question is if you're starting a company and you're going out and let's say you're successful in raising some outside money, what fraction of the equity goes into the equity compensation pool. Well Charlie had that nice template for financial projections. And he had a head count. And as you recall, he matched the head count to equity based on the type of position. And the initial stock pool for companies is usually two to three years worth of the head count plan.

Now what does that translate if your venture-backed. In my experience, at first round venture financing, you're probably going to have somewhere between 12% and 18% of the total equity reserved for employees. It'll be at the lower end of that if you've got more of your team fleshed out. It'll be at the higher end or even higher if it's just you and you've got to hire in some people. But that's a reasonable rule of thumb. And for most equity plans, you're going to think about employees, directors, and maybe consultants.

And if you try to calibrate this, there are surveys and places you can go to see what the market

is for different types of equity grants.

Again, from Charlie's slides, just as a reminder in one place. These were some ownership percentages he talked about after two rounds of financing. And you will always end up granting more later to keep people incented.

This was his spreadsheet with dilution showing. I just put it here for reference. [? Yonald ?] is going to do a great job on the last night of the class where he's going to walk you through what actually happened to employees and founders and investors. So I think we'll let him get into that in more detail.

Now we'll run through common forms of equity compensation. There's restricted stock. And there are two types of options. One is an incentive stock option, which has certain tax benefits and their non-qualified. Again, restricted stock is stock that's granted to somebody or sold to somebody and it starts a capital gains holding period for tax and SCC. It's usually subject to vesting. Charlie talked about vesting. And you may want to file an 83(b) election because of the vesting. You can read more about that in the Founder's Memo.

Incentive stock options are options to comply with tax requirements. They're granted only to employees. And they have to be granted at an exercise price that's fair market value. What does that mean. That means you can buy 100 shares of stock at today's price. And the theory is that hopefully, over time the stock goes up. Maybe it's $10 exercised and when a person exercises it, it's $100. So they pay $10 and they get stock worth $100.

And those exercise vesting occur over time, typically. And there's no tax on it. You're not taxed when you get the stock. There may be an alternative minimum tax issue. Again, a placeholder for you to think about. And there will be taxation on the sale of the stock. And if you end up following the holding period, you'll have capital gains, which is a good thing. And that's one year from the exercise and two years from the date of grant.

And non-qualified are basically options that have no tax on vesting or grant, but ordinary income on exercise. So that means when you exercise the difference between the exercise price and the fair market value, you have to pay-- it's like somebody gave you that much cash.

Now these instruments of founder stock, restricted stock options, and non-qualifieds all work together in sort of a way. What you really would like to do if you're a founder or early on, you actually want to get your stock early and then ride the appreciation. Just like you'd buy any

stock in the market.

What happens though if you're given stock-- you have income when you get the stock based on the market value. So over time, as the company raises more rounds of funding, it becomes more expensive for someone to actually acquire the stock directly. And since there's no market for the stock, you're in a situation where you're taxed on the stock but no exit. You have no way to pay it. So that's when people switch over and use options. Because options-- you're not taxed when you get an option. You sort of control when the tax occurs. So that's just a general theme to think about.

Vesting. There are basically two types of vesting. Time-based vesting and performance vesting. What you're really trying to do is you go into it thinking, well, we have a set of things we need to get done. And you want to provide incentives for people to do it. And so in an ideal world you'd know exactly what needed to be done. And you'd say, when you deliver the first prototype, you vest on and 50% of your option. And when we do our first customer ship, another 25%.

The problem is it's never that clean. You're never quite sure. And so the default tends to be time. We're going to be in this for a period of time. If you're here pulling on the oar with a team, then you'll vest. Typical vesting is a one year cliff. That means if you're here less than a year you don't get anything. After one year it's usually 25%. And then it's either monthly or quarterly over the next three years. So at the end of four years, you're fully vested and have rights in the stock.

I put something in here about accelerated vesting on changing control. You'll hear about that. And there are a whole bunch of issues about whether that makes any sense. So keep that in mind.

You have to think about what happens if someone leaves. You gave them this equity and do you get to buy it back. Do they forfeit it. What if they leave under bad circumstances where they gave away trade secrets. And what if they violate non-competition agreements. So you probably want to think about those in the design of your plan. And again, think of this as a checklist when you're dealing with your lawyer on this. Have they talked about these things.

Now suppose you actually have the stock and you leave. What's the deal. Do you get to keep it when you leave. Do you have to sell it back at then fair value. Never. I mean, these are

philosophical issues that the Founder's Memo talks about. And at the beginning is a good time to talk about it because you don't know who's going to be leaving. So it's sort of a neutral thing about what your philosophy is going to be.

Over time, on a people issue, at the beginning the whole issue of boards-- I put independent directors here. Somewhere around the time of first funding. Funding people are going to want to come in and the venture capitalists actually do have to get some board seats under the rules that they operate under. There's often an independent director that they'll negotiate.

So you want to be thinking ahead. Who's an independent director that could be on my board and acceptable to venture. Because if you don't have a candidate in mind they certainly will talk about it.

OK, financing. I'm going to run you quickly through securities laws.

Essentially, this is an area you don't want to try to do brain surgery yourself with. You can get into really big troubles. Any offer or even an offer of securities has to be registered with the Securities and Exchange Commission. And that could be a big expensive proposition. So you want to think about exemptions. There are exemptions there for private placements. And there's certain rules you have to do in following it through.

What you don't want to do is-- question is, if you don't comply, what is the big deal. Well, first of all, it's criminal-- can be criminal. And it could be personal liability on the founder. In other words, they can get their money back from you. And it could be a mess. And in the materials, under Resources, there's a column I did for Boston Business Journal that talked about a company that really got into bad trouble because they screwed up on this.

So my red letter thing here is, don't, in a business plan, put language in that offers to sell. We're offering 10% of the company for $2 million. How do you say that's not an offer. So the business plan or any of the documents, really, is this is an opportunity. We're addressing this market. The market's this big. And you might say, and the resources we need is this amount. If people are interested in that, they're going to have a conversation with you. And you can handle it in a careful way.

But I see over and over again, people putting in plans. First of all, it's presumptuous, right?

Have a discussion with the investor and you can get down the numbers. But certainly don't put it in the plan.

We do have now crowdfunding coming along. We're waiting for some SEC rules to get a little bit more refined. That's going to open up a whole other set of issues. But it may be a good way-- just like crowdfunding for products has been around-- this is crowdfunding for selling stock or interest in the company. I don't know enough yet to explain how that's going to work for you. But keep an eye on that separately.

I put in a section in the deck looking at capital structure instruments. For some people, this is old hat. For the people that aren't, this is something you should look at. It just talks about different kinds of instruments. At the bottom is common stock. Common stock is what's the value after everyone else has gotten paid. So if you're Bill Gates and you own common stock in Microsoft, you're like the richest guy in the world. If you're a startup, this might be worth nothing.

Above it are different instruments that you can play with. And for the non-Sloan people, take a look at the next few slides that describe this. I'm just going to zip through them, given the time.

This visual just shows what a capital structure will look like over time. At a startup, it's primarily all common. And by the time you're Microsoft or an LBO, you see more complex capital structures. That's your instant MBA course for people not in the MBA program.

We talked about convertible note financing the other night. Traditionally this bridged from one round to another as you were trying to keep the company going. It has the benefit of being quick, relatively inexpensive, and it can avoid valuation issues. So a classic problem is the first run investors value the company too high. The next round comes in and says, we're never going to pay that much because things have happened or whatever. And the first round has to have this discussion-- how they get crammed down in their percentage of the company.

Convertible note allows you to sort of not set that actual valuation until later. There's a good discussion of this at startupcompanylawyer.com, which talks about the pros and cons. So again, another resource to look at.

This is an example of a term sheet. If you go to firms-- like Cooly LLP has a nice, open source models of what the documents look like. There's also some good resources at Wilson Sonsini

and at Goodwin Procter. Much more accessible these days than they were back when I was starting out.

Now we're going to run quickly through angel and venture funding.

A typical way to do this is you take a term sheet and you take it apart and you talk about each of the little components of the term sheet. And that's a useful way to do it. I think the way for an entrepreneur to think about why all these terms is to understand what the major deal elements are. And from an investor viewpoint, it's these four elements.

One is a preferred return, for reasons we'll talk about. Protection of valuation and position versus future money that comes in. The requirement to manage the investment and the exit strategy.

So for example, if you think a preferred return, an investor looks at you and he sees a plan or a promise. The investor writes a check. The investor has basically done everything that he said he would do. He'll be there to advise and all that. But basically he'll want his money. The entrepreneur hasn't done anything from the investor perspective. They put together a plan that's yet to be executed on.

And so the result is the investor typically wants to get paid before the entrepreneur gets paid. He gets his money back first. And the instrument is usually the convertible preferred stock. It usually has dividends. And an important part is the liquidation preference.

So the liquidation preference says, look, there are two types. One is a straight preference. It says, if the company-- we have a liquidation-- which I'll talk about what that means in a moment-- the investor can either choose to get the money he put in back pluses dividends. Or you can convert, because it's usually convertible, into whatever the convertible amount of the company would be. So it's simply a math exercise. That's a straight liquidation preference.

A participating or double dip is one that's not particularly good in many cases for an entrepreneur. It says the investor gets his money back first and then he converts and pretends he was like you and gets a percentage of the company. I put a chart in comparing how that math works. I think it's pretty self explanatory if you look at it in the materials.

And I put a case in here which says-- there are two cases presented. One is, a founder sells 40% of the company for $5 million of convertible preferred, with a $5 million liquidation

preference. But no participating rights. In Case B, they sell 33% of the company with participating preferred. And this example shows you the trade off.

Essentially, in this case, if the exit is $35 million or less, than the first case is better for the founders, which means actually giving up a bigger percentage of the company and having a straight preferred. So take a look at that after class.

The liquidation events could be really liquidation, meaning the company's shut down. But it's often defined to be a merger. So if the company is acquired, the liquidation kicks in. That's the preferred return part as you look through the term sheet.

The second major element is protection of value and position versus future money and that's where anti-dilution protection comes in. And I give you an example of a term sheet with that.

Anti-dilution and conversion go hand in hand. So typically, a convertible-preferred trades one for one. One share of preferred converts to one share of common at the beginning. And anti-dilution says, if an event occurs in which you issue stock for less money or priced less than price I paid, then when I convert I want to get more shares. Because your value of the company's gone down. I came in at this level and you did something. You didn't grow the company, you made the value go down, and therefore I need to get compensated.

And the two main types of these is the full ratchet, which is really bad for an entrepreneur. That says if I issue even one share of stock for less money than what you, the investor, put in, then the price of that one share of stock becomes a conversion price. So if I converted at $10 a share and you issued one share at $1, now all my money converts at $1 a share. So I get 10 times more.

The more typical one is the weighted average. And there's a formula for that that. It looks at the price and the amount.

On the resources page there are a bunch of venture capital terms that will help explain a lot of what we went through here. And that brings us to borrow, which is we're going to go into negotiation skills, in Yost you're doing organization and people issues. Tomorrow?

**AUDIENCE:** [INAUDIBLE]

**JOE HADZIMA:** So I raced you through a whole bunch of legal stuff that we could have spend hours on each portion of it. Again, I want to step back, say, take the deck that's there, read through it, and use it as sort of a guidepost as you go forward on some of the stuff. There are plenty of resources that I've mentioned that you can sort of self educate. I'm happy to chat with you offline about those things. I know no other way to get it out in front of you, short of having you take a whole legal course. So hopefully you'll find that.